Section II

GENERAL ORTHOPAEDICS

23. Leg-Length Equalization by Femoral Shortening 221
M. John Rowe, Jr., M.D., and G. D. Bock, M.D.

24. Repair of Digital Nerves in Lacerations of the Hand and the Fingers . 227
Michael L. Lewin, M.D.

Diagnosis 228
Surgical Anatomy 228
Procedure 230
Results 232

25. Small-Element Lesions of the Cervical Spine Due to Trauma 235
Richard F. Wagner, M.D., and Martin S. Abel, M.D.

Clinical Examination 238
Clinical Series 240
Treatment 242
Follow-up Studies of Fractures 243
Experimental Studies and Correlation 243

26. X-ray Projections of Anatomic Structures in the Cervical and the Lumbar Vertebrae 249
Raymond G. Tronzo, M.D.

Cervical Vertebrae 249
Lumbar Spine 259

27. Epiphysial Fractures of the Head of the Radius in Children 264
Earl D. McBride, M.D., and J. Charles Monnet, M.D.

Three Cases of Late Open Reduction With Poor Results 267

28. Local Ischemic Necrosis of the Leg 272
Ivar J. Larsen, M.D., Edward W. Boone, M.D., Elliot L. Coles, M.D., and W. Harold Civin, M.D.

Discussion 277
Conclusions 280

Paragon 28 v. Treace Medical Concepts
PGR2026-00017
Paragon Ex. 1031

Section III

ITEMS

29. Multiple Joint Lesions in a Young Negro Adult Exhibiting the Sickle-Cell Trait 287
Donald Yeoman Stewart, M.D.

Discussion 288
Summary 292
Conclusions 292

30. The Sesamoids of the Great Toe—The Pedal Polemic; Report of 3 Cases 295
Morton H. Leonard, M.D.

31. Nonunion of First Thoracic Spinous Process; Case Report 302
Duncan C. McKeever, M.D.

32. The Cushion-Socket Below-Knee Prosthesis 304
Ernest M. Burgess, M.D., and Eugene Coleman, C.P.

Index 309

This material may be protected by Copyright law (Title 17 U.S. Code)

12

The Author's Bunion Operation From 1931 to 1959

PAUL W. LAPIDUS, M.D.*

The author's bunion operation was first performed at the Hospital for Joint Diseases on April 8, 1931, and thus far has stood the test of time; it is still being done successfully. The details of it were published as a preliminary communication in February, 1934.

The purpose of this chapter is to describe our present-day approach to the bunion problem. Since the earliest days of his orthopaedic practice, the author has been aware of the frequent association of the metatarsus varus primus with bunions. What he was *not* aware of at that time was the fact that the same observation was made by anthropologists long before orthopaedic surgeons thought of it. Already in 1882, Leboucq pointed out that the divergence of the first metatarsal was due to the extreme angle made by the plane of the distal articular facet of the first cuneiform bone with the

* New York, N. Y.

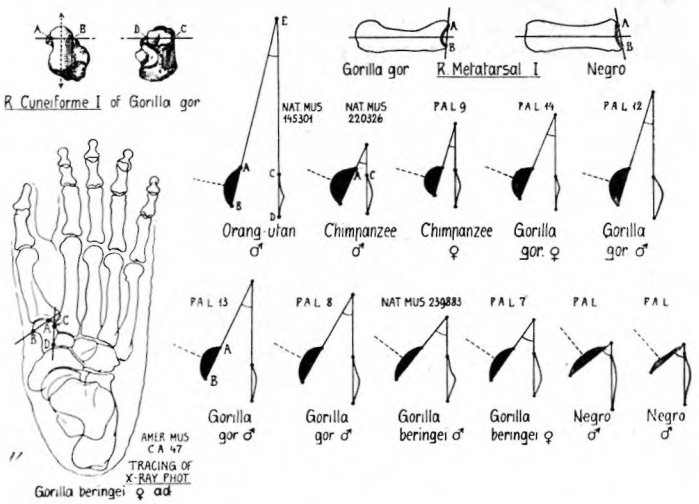


FIG. 1. Tracing of the roentgenogram of the skinned foot of an adult female mountain gorilla (beringei) showing the location of the section through the joint of the hallux and the first cuneiform. Figures on the right are accurate copies of these sections through the first cuneiform bones of various higher primates. Line A-B represents a section through the center of the first cuneiform-metatarsal joint in the plane roughly parallel to the sole of the foot. Line C-D is drawn through the middle of the joint between the first and the second cuneiforms and was found always to have practically the same direction as the morphologic axis at the foot. The angle B-E-D (see orangutan) determines the medial slant of the plane of the first cuneiform-metatarsal joint. The greater this angle the less the slant and, likewise, the divergence of the first metatarsal. According to Schultz, in man this angle is 56 to 50°; in the terrestrial gorilla beringei it is 39 to 35°; in the arboreal Gorilla gorilla it is 30 to 18°; and in monkeys it is 24 to 13°. The black semicircle represents the shape of the first cuneiform-metatarsal joint, which is more ball-and-socketlike in movable hallux of the lower primates and becomes flattened in higher primate and especially in man, with the loss of mobility of the first metatarsal. (Reprinted from Human Biology, vol. 2, no. 3 [chapter entitled "The Skeleton of the Trunk and Limbs of Higher Primates," by Adolph H. Schultz] by permission of the Wayne State University Press)

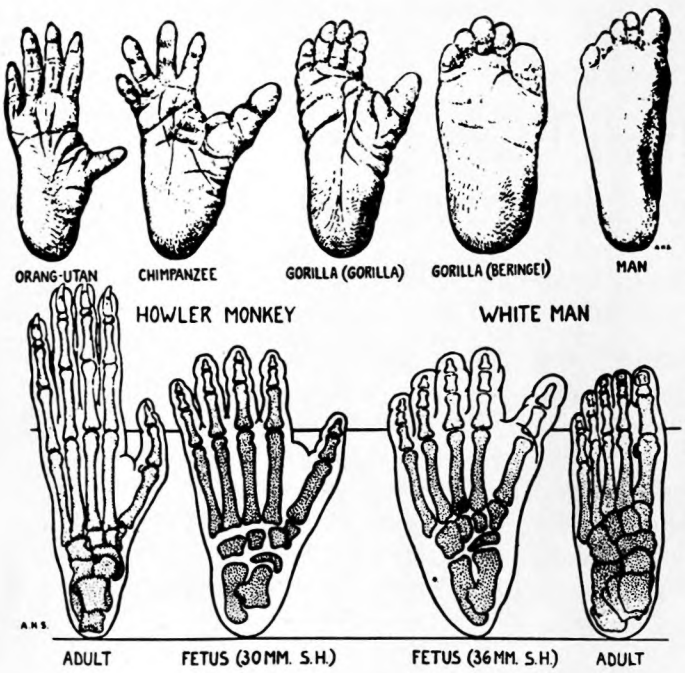


FIG. 2. Note the shortening of the hallucial ray from man to orangutan and also the increased divergence of the big toe in prehensile foot of lower primates as compared with man (upper row). The difference between the big toe in gorilla beringei and that of the Gorilla gorilla is most interesting. Although they are very closely related, the first spends a great deal of time walking on the ground; therefore, his big toe resembles very closely that of man, while the hallux of the prevailingly arboreal Gorilla gorilla still retains simian features and is more like that of the chimpanzee. In the lower row is a semidiagrammatic drawing of feet of fetal and adult man, and howling monkey, showing ontogenetic reduction of the lesser digits in adult man and their increase in a grown-up monkey. Also note that the hallucial elements are almost similar in both embryos, but the first ray of the adult man becomes stouter and loses its divergence while the reverse growth changes take place in the monkey's foot. Distance from heel to second metatarsophalangeal joint is same absolute length in all 4 drawings. (Schultz, A. H.: Quart. Rev. Biol. 1:465)

long axis of the foot. This angle approaches that found in the prehensile arboreal foot of the primates (Fig. 1). In 1927, Straus, an anthropologist, who probably never saw a patient with bunions, stated:

> In the adult human, the long axis of the basal phalanx of the hallux is not, as a rule, in line with the long axis of the first metatarsal. The phalangeal portion is bent toward the other digits. Adduction of the hallucial phalanges is the rule for all human development, being quite as marked in the fetus as in the adult. This condition cannot be ascribed to wearing boots, for it is general among the lower primates and was present in a howler fetus as well. In man it persists most likely as a relic of the days when the foot was a grasping organ and the hallux was bent as a hook toward the other toes.

Figure 2 (Schultz, 1926) illustrates the trend of ontogenetic development of the foot in the howling monkey and man, and also shows the changes of the big toe as it gradually lost its prehensile functions from ape to man.

Figure 1 (Schultz, 1930) shows the changes of the first cuneiformometatarsal joint, also from ape to man. The two cardinal features are (1) diminution of medial slant of the first cuneiformometatarsal joint and, consequently, also of the medial divergence of the first metatarsal, and (2) the flattening of the first cuneiformometatarsal articulation, which is more ball-and-socket-like in the mobile hallux of the lower primates.

The following table (Straus, 1927) brings out the fact that the varus of the first metatarsal, measured by the angle between the long axes of the first and the second metatarsals, is more marked in the human embryo, being 32.0° in an eight-week human fetus, and diminishes to 6.2° in an adult

ANGLE (APPROXIMATE) BETWEEN LONG AXES OF METATARSI I AND II DURING GROWTH OF MAN AND HOWLING MONKEY AND IN SOME OTHER PRIMATES

AGE	AVERAGE IN DEGREES	RANGE OF VARIATION IN DEGREES
Man		
8th week fetus	32.0	
3rd mo. fetuses	18.7	14.0–30.0
4th mo. fetuses	11.1	3.5–14.0
5–6 mo. fetuses	10.1	6.5–15.5
7–8 mo. fetuses	6.1	3.0– 9.5
9th mo. fetuses	8.9	3.0–19.5
Newborn	5.8	4.0– 8.0
Juvenile	5.0	2.0– 8.0
Adult	6.2	3.0– 9.0
Anthropoid Apes		
Orangutan, adult	46.2	42.0–49.5
Chimpanzee, juvenile	42.0	
Chimpanzee, adult	39.0	
Gorilla, juvenile	25.0	18.0–30.0
Gorilla, adult	25.0	20.0–30.0
Hylobates, adult	17.5	11.0–33.0
New World Monkeys		
Alouatta, fetus 111 mm., C.R.	55.0	
Alouatta, newborn	40.0	
Alouatta, adult	23.0	

Note gradual ontogenetic diminution of hallucial divergence in man from 32.0° in the 8th month fetus to 6.2° in adult. Anthropoids have a much greater angle, which reaches an average of 46.2° in prevailingly arboreal orang-utan. It is interesting to note the diminution of divergence with growth also in Alouatta (howling monkey) (Straus, W. L., Jr.: Contrib. Embryol., No. 101, **19**:119)

man. In other words, the hallux of the human embryo has simian features that gradually are lost with growth.

The above-quoted anthropologic works seem to support the postulations made by the author in his preliminary report in 1934, that the bunion is more prone to develop in an "atavistic" foot with metatarsus varus primus. This type of foot apparently became arrested in its ontogenetic development and retained some features normally present in the human embryo and in the adult foot of the lower primates. It may be considered as a reversion to a primitive state, presenting "congenital potential predisposition toward hallux valgus formation, and thus the often observed hereditary predisposition toward this deformity can be readily understood" (Lapidus, 1934). When harelip and cleft palate are repaired, or an operation for undescended testicle is performed both being typical examples of an arrest of ontogenetic development, the surgeon attempts to complete the process that normally takes place during natural growth. By the same token, if the persistence of the metatarsus varus primus, together with hypermobility and the apelike shape of the first cuneiformometatarsal joint, allowing excessive tibial abduction of the first metatarsal in an adult man, is accepted as an arrest of development and is one of the main predisposing factors for bunion formation in a great number of patients, it is only logical to conclude that surgical repair should also consist of correction of metatarsus varus primus. If the divergence of the first metatarsal in an adult is explained as a failure of nature to complete its normal cycle of growth, then it is up to the surgeon to complete what nature failed to do, similar to harelip, cleft palate or undescended testicle.

The idea that the metatarsus varus primus is a primary factor with subsequent formation of hallux valgus is not a new one. It has been advanced by a number of orthopaedic surgeons, as can be seem from Figure 3 (after Timmer), a schematic illustration of some of the numerous operative procedures devised for correction of the bunion. Once more the author wishes to repeat that, except for the details of the operation, he does not claim priority or originality. Quite a few surgeons in the past and a number of them today approached this problem in somewhat similar manner, attempting to correct the metatarsus varus primus.

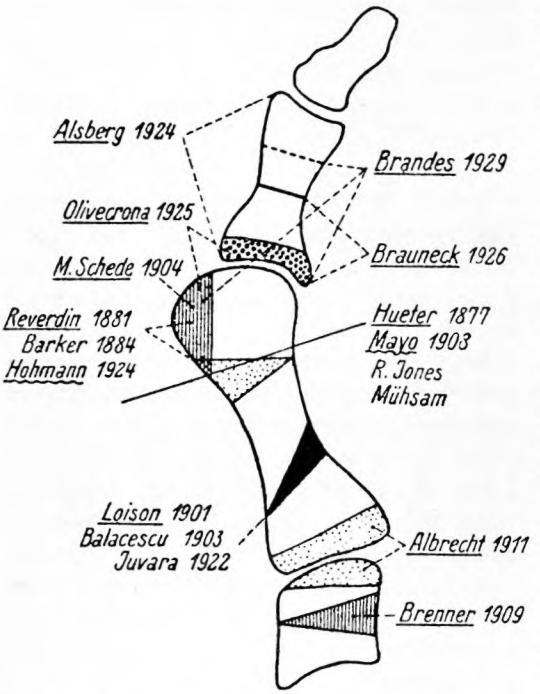


FIG. 3. Schematic drawing of various operative procedures devised for correction of bunion. The name of the author and the year of description of the operation are indicated. (Timmer, H.: Die Behandlung des Hallux valgus, Leipzig, Barth)

As already stated, the degree of divergence of the first metatarsal away (tibialward) from the second depends upon the shape and the range of motion in the first metatarsocuneiform joint. The long axis of the first metatarsal forms an obtuse angle, open tibialward, with the long axis of the first cuneiform; the apex of this angle is at the first cuneiformometatarsal joint.

Osteotomy to correct an angulation deformity of any long bone is performed usually at the apex of the angulation, and not distally or proximally to it; otherwise, a bayonet-shaped deformity is produced. An ankylosed knee joint with genu valgum or with flexion deformity is best corrected by an osteotomy placed right through the former line of the joint and not over the femur or the tibia. Therefore, it is the author's preference to correct the metatarsus varus primus at the first cuneiformometatarsal joint; numerous and variable osteotomies of the first metatarsal shaft, and particularly so over its distal part, never have seemed to the author to be mechanically sound (Fig. 3).

Furthermore, any osteotomies require adequate and prolonged immobilization to prevent displacement of fragments and to ensure their firm bony union. This, again, makes them undesirable. In another group of operative technics, attempt is made to utilize soft tissues (muscles, tendons or fascia) to approximate the first metatarsal head to the second and, thus, to correct the metatarsus varus primus. For a number of years it has been our preoperative routine in bunion cases to take dorsiplantar roentgenograms of the foot tightly bandaged across the metatarsal heads in addition to other routine exposures. We learned that in some cases we were unable to approximate closely the first and the second metatarsal heads, with some persistence of metatarsus varus primus even on tight bandaging. This was obviously due to a fixed tibial abduction contracture at the first cuneiformometatarsal joint. Consequently, is it reasonable to expect a small intrinsic muscle of the foot, as, for instance, the abductor hallucis, when it is transplanted onto the first metatarsal neck, to adduct the first metatarsal fibularward, and especially when there is fixed tibial abduction contracture present in the joint? Fascial or tendinous transplants anchored to the metatarsal necks to correct their spreading, advocated by some surgeons today, have also been tried by the author (1933) but were abandoned in favor of the bony fusion of the first metatarsocuneiform joint with creation of a bone bridging the first and the second metatarsal bases. Of course, it goes without saying that when correction of the first metatarsus varus is indicated, it is always combined with the correction of the valgus deformity of the big toe itself. In the latter procedure, not only do we depend on passive re-establishment

of balance between (tibial) abduction and (fibular) adduction of the big toe, but also we utilize the abductor hallucis muscle to supply the active power to maintain the big toe in proper alignment with the first metatarsal, as will be described below (Fig. 4).

Another group of operative technics consist of resection of the first metatarsophalangeal joint itself. The old Mayo-Küttner resection of the first metatarsal head never appealed to the author, and he is even more convinced now than he was in 1934 that "any operation creating shortening of the first metatarsal, or of the big toe, is emphatically condemned as unphysiological, and causing static and dynamic disturbance of the foot."

The resection of the base of the proximal phalanx according to the Keller-Brandes procedure has gained some popularity recently, mainly because of its simplicity and allegedly short postoperative disability. However, not infrequently after this procedure the big toe becomes a short, dangling appendage held above the ground, and the important "shove-off" function of the big toe may be lost permanently. Consequently, if one wishes to obtain as close as possible restoration of normal anatomic and physiologic relations, one cannot accept the Keller-Brandes operation.

INDICATION FOR OPERATION

Bunions are very common, especially in females, who, using their feet primarily for sex appeal, locomotor function being given only secondary consideration, succumb to the dictates of fashion and develop the deformity. The poorly fitting, narrow woman's shoe with a high heel is a factor in developing the malformation in a foot, which most of the time possesses a congenital and often hereditary predisposition toward bunion formation. In this respect, the shoe may be compared with a developing solution that only brings out the picture in a previously exposed photographic film.

We have operated upon a large number of female feet. Only a few male patients have sought surgical correction. A large percentage of bunion feet give very little, if any, discomfort, and can be treated adequately with properly fitted shoes. On the other hand, even mild bunions, especially in females, may produce a great many complaints, especially while "breaking in" a new shoe.

In addition to actual functional disturbances and disability, quite a few patients request the operation for cosmetic reasons. As a rule, we limit our surgical correction to selected cases in which functional and cosmetic consideration seem to warrant it. Therefore, although for the past many years we have operated upon a large number of patients, they represent only a small percentage of extremely numerous patients with bunions treated conservatively. Furthermore, if surgical procedure is undertaken, we do not attempt to correct the metatarsus varus primus as frequently as we did originally. We must admit that with the accumulation of larger experience through many years, we have become more conservative and in a number of cases have limited our procedure to correction of the hallux valgus alone. It has been our observation that after satisfactory correction of hallux valgus, using our modification of the Silver procedure, the varus of the first metatarsal may diminish simultaneously, provided that there is adequate mobility of the first cuneiformometatarsal joint to allow the approximation of the first and the second metatarsal heads. This mobility is estimated on roentgenograms with tight bandaging across the metatarsal heads, as already described. It has been our impression that in spite of the fact that metatarsus varus primus may be the main factor, hallux valgus developing subsequently, in a number of cases successful correction and maintenance of this correction of the big toe deformity are more important and often may be performed alone. On the other hand, additional correction of the first metatarsus varus, when it is

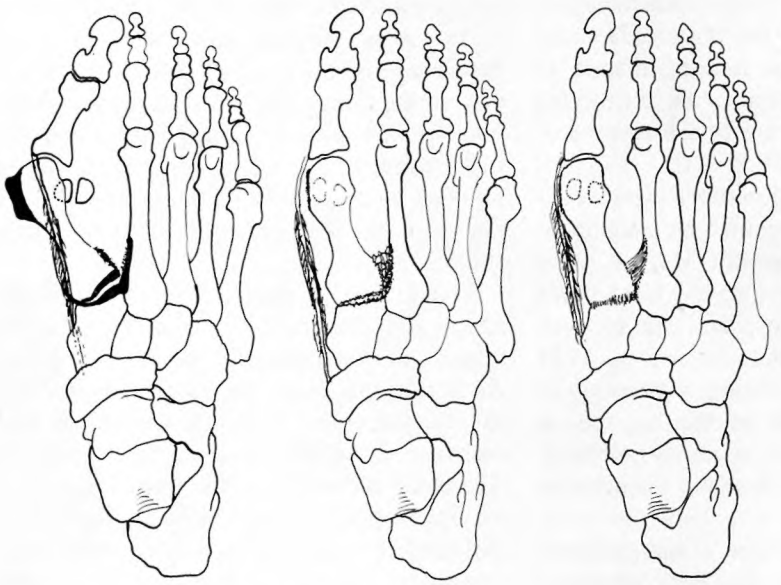


FIG. 4. Operative technic. (Lapidus, P. W.: Surg. Gynec. & Obst. 58:183.) Note the plantar displacement of the abductor hallucis in bunions and its action as a plantar flexor. It is relocated along the medial aspect of the first metatarsal, and its *abduction* action is re-established.

pronounced, with first and second metatarsals forming an angle of 10° to 12° or more, may ensure better results in the long run.

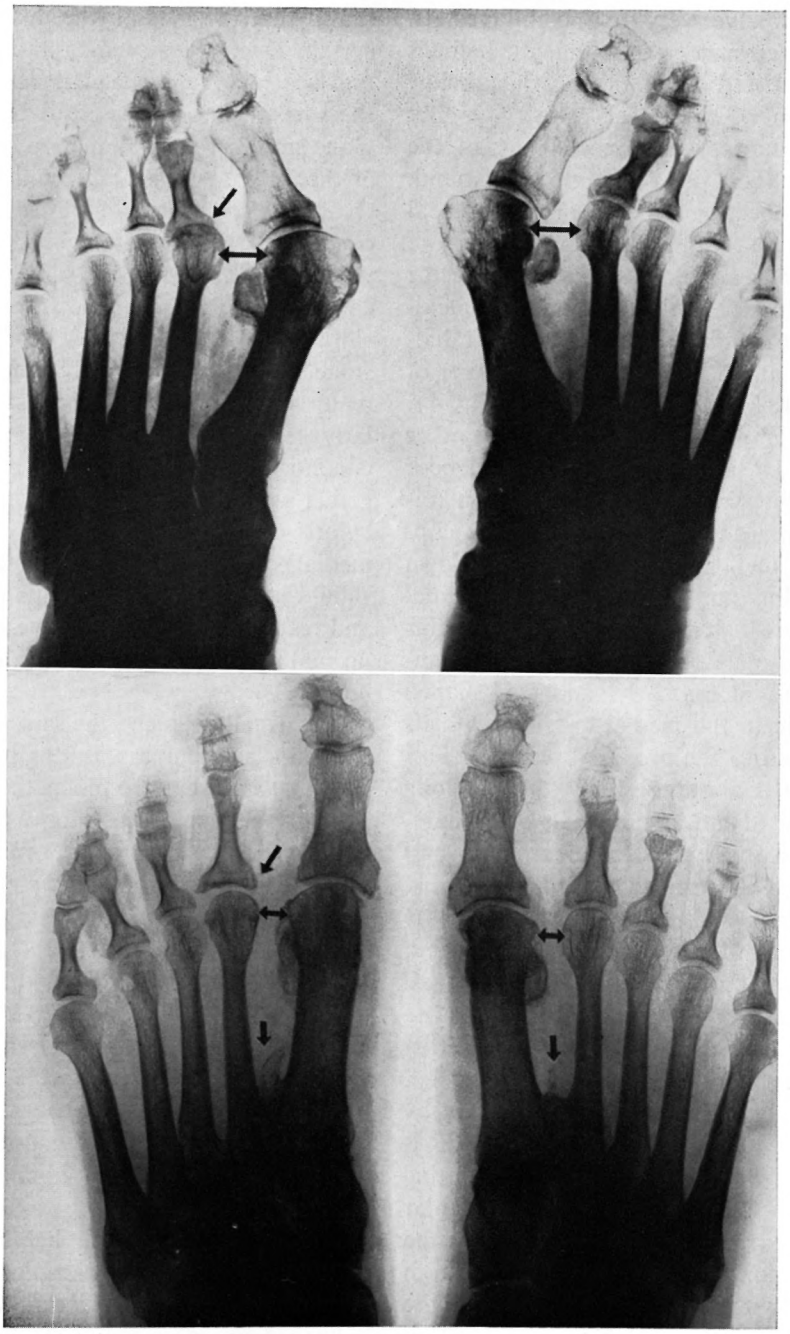
A survey of end-results of various operative procedures for correction of hallux valgus performed at the Hospital for Joint Diseases during 10 years (1931-1940) has seemed to indicate that better results were observed when metatarsus varus primus also was corrected.

We have operated upon a considerable number of patients under local anesthesia when we limited ourselves to correction of the hallux valgus alone. There is no need for a tourniquet in this procedure, which also requires less time to perform, and the postoperative recovery may be a few days shorter. On the other hand, when correction of metatarsus varus is undertaken, a tourniquet is used, and, therefore, general anesthesia is required. The decision, of course, should depend on the judgment and the personal experience of the surgeon, as well as on the condition and the requirements of each patient. If the patient is not too old and is robust, and is willing to invest an extra week or two in anticipation of a somewhat better eventual result, and if the surgeon is quite confident in his hospital facilities and is fully familiar with the foot, the combination of both procedures may be indicated. Otherwise, mere correction of hallux valgus alone will be a preferable and a safer undertaking, and may also give a very satisfactory final result.

OPERATIVE TECHNIC

The present operative technic remains essentially the same as described originally in 1934 (Fig. 4). If the correction of metatarsus varus primus is planned, the operation is performed under general anesthesia. An Esmarch rubber bandage is first applied from the toes up to the lower quarter of the leg, where it is bandaged tightly over a towel and is used as a tourniquet.

The operation over the big toe joint is performed first. A straight longitudinal incision about 3½ to 4 inches (9-10 cm.) long is made along the medial aspect of the big toe and the first metatarsal. The subcutaneous veins are ligated. The medial cutaneous nerve frequently seen in the wound is identified and retracted. The bursa over the bunion is opened, and further dissection is carried proximally in the same plane, as the



FIGS. 5 to 8, 3 cases (L.K., B.K. & A.S.) following correction of metatarsus varus primus in hallux valgus. (L.K. and A.S. also had bilateral second hammertoe operations; in Case A.S., the second toes also overlapped the big [see Fig. 7, *top*]). FIG. 5, L.K. (*Top*) Before operation. (*Bottom*) About 6 years after operation.

tissues here have very few blood vessels. The fascia covering the abductor hallucis muscle is incised longitudinally just below the insertion of this fascia along the first metatarsal shaft. A muscular belly of the abductor hallucis pops out into the wound. Its loose connection with the first metatarsal shaft may be separated by blunt dissection. As a rule, in nearly all bunions the abductor hallucis is found displaced plantarly, blending with the medial belly of the flexor hallucis brevis and acting as a plantar flexor of the big toe rather than its abductor (Fig. 4). These muscles are separated from each other also mostly by blunt dissection. The slender tendon of the abductor hallucis is then followed distally and separated from the capsule of the metatarsophalangeal joint down to its insertion onto the base of the proximal phalanx, care being taken not to sever this tendon or to open the joint capsule. The tendon is retracted plantarly, and a U-shaped flap is made in the medial capsule, with its base attached to the proximal phalanx. This flap usually is about ¾ inch (2 cm.) long and ⅜ inch (1 cm.) wide at its distal base, tapering proximally to the neck of the first metatarsal. The capsular flap is reflected distally, care being taken to dissect it from the medial aspect of the first metatarsal head, preserving its full thickness. Usually a small artery is cut over the metatarsal neck. The joint now is opened by reflecting the flap distally. The neck of the metatarsal is exposed. The "sagittal groove," so well described by Haines and McDougall (1954), is noted. It runs in dorsoplantar direction, separating the normal lateral cartilaginous articular surface that remains in contact with the laterally subluxated proximal phalanx from the fibrously degenerated cartilage of the medial part of the head. This groove often is quite deep in marked cases of bunion and is reddish, containing denuded rough bone. The "bunion" itself is represented usually by the dorsomedial prominence of the first metatarsal head. This prominence is shaved off so that the medial, the dorsal and, to a certain extent, the medioplantar flare-up of the first metatarsal head is removed. Now the medial part of the head is in the same plane and is the continuation of the cortex of the neck and the shaft of the metatarsal. Occasionally there is a dorsal prominence over the first metatarsal head, which likewise has to be shaved off. Small wood-carving chisels obtainable in any hardware store in a set, together with a sharpening stone, have been used by the author for many years and are indispensable, particularly for resection of the first metatarsocuneiform joint. They are sterilized, together with the stone, and sharpened just before the operation. When resecting the medial part of the first metatarsal head, care should be taken to preserve its round shape, and especially its part covered with the normal cartilage, without excising too much bone.

We usually replace the capsular flap and the skin and palpate through them to be sure that no bony prominences are left.

The subcutaneous tenotomy and capsulotomy then are performed over the fibular aspect of the first metatarsophalangeal joint from a dorsal approach, while the big toe is forced gently into varus (10°-15°) position. A stout sharp tenotome should be used for this, and it should be inserted to hug the bone and the joint closely, as the blood vessels and nerves pass more superficially to bone in surrounding soft tissues. The medial tongue-shaped flap of the capsule is sutured to the tendon of the abductor hallucis longus with considerable tension, several No. 00 chromic stitches being used. The plantar and the dorsal capsular wounds are also closed. At the same time the abductor hallucis belly, together with its tendon, is shifted dorsally, running now along the medial aspect of the first metatarsal instead of plantarly to it, and its action as an "abductor" (tibialward) instead of a plantar flexor of the big toe now is re-estab-

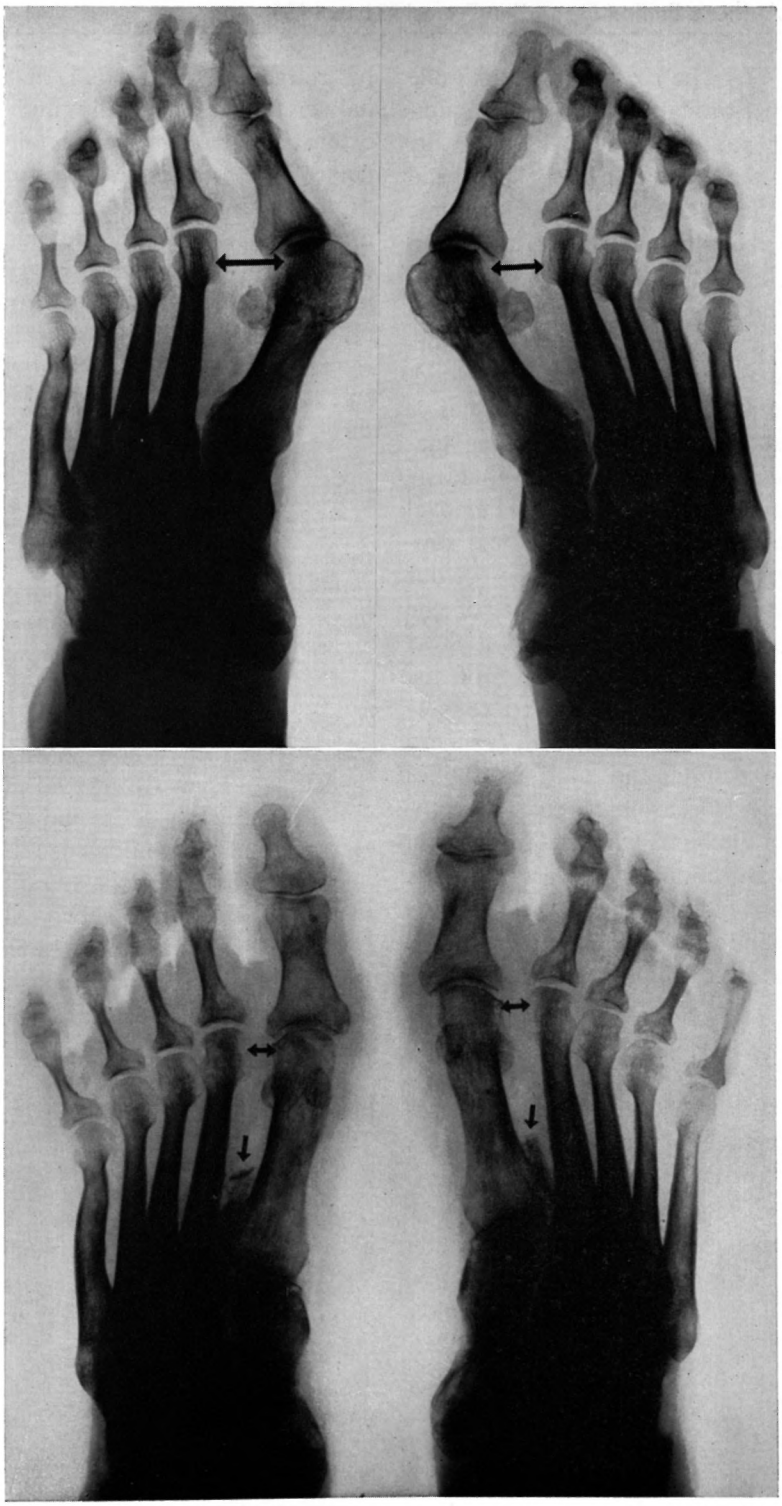


FIG. 6, B.K. (*Top*) Before operation. (*Bottom*) About 6 months after operation.

lished (Fig. 4). The closing of the capsule should be performed carefully and judiciously. All capsular slack produced by resection of the medial part of the head should be removed, but at the same time the capsule should not be sutured too tightly as later to cause limitation of motion of the big toe; a good balance between abduction and adduction and dorsal and plantar flexion should be created. As a rule, the big toe in hallux valgus is in internal rotation, so that both big toenails face each other. This also should be corrected. In ordinary cases no removal of the bursa is ever attempted unless suppurative bursitis is present. In a few of our patients, there was communication of the infected bursa with the joint. In these cases, after thorough débridement of the infected tissue, we were able also to perform the bunion operation with primary union of the wound and used antibiotics postoperatively. Occasionally there is communication of the bursa with the joint also in cases without infection. In one case there was a very extensive deposition of uric acid in the bursa, and the joint surfaces were canary yellow, all impregnated with uric acid crystals. Perfect primary healing was also obtained in this 69-year-old man. The skin is closed without suturing the subcutaneous structures. If the procedure is carried out adequately, the big toe remains well corrected without any external support.

As already stated, in a number of our cases we were able to obtain very satisfactory and lasting results after this procedure alone. If, however, the correction of the metatarsus varus primus is indicated, it is carried out as a second step following completion of the operation on the big toe. A longitudinal incision about 3½ inches (9 cm.) is made along the dorsum of the first metatarsal and the first cuneiform. The first cuneiformometatarsal joint is exposed by retracting the tendon of the extensor hallucis longus medially and that of the extensor hallucis brevis laterally. The cutaneous nerve branches are identified and protected. The V-shaped space between the first and the second metatarsal bases is exposed by dissection, hugging the first metatarsal closely. The perforating plantar branches of the dorsalis pedis vessels are retracted distally and fibularward with the soft tissues when exposing the second metatarsal base. Occasionally the veins are ruptured, but we have never had any complications from that.

The cortex from the adjacent surfaces of the base of the first and the second metatarsals is removed, leaving the bone chips in situ. The first cuneiformometatarsal joint is opened on its dorsal aspect. The adjacent cartilaginous articular surfaces of the first metatarsal and the first cuneiform are shaved off. Here a small wood-carving chisel about 5 inches (13 cm.) long and about ⅜ inch (about 1 cm.) wide, is indispensable! We learned that no real wedge resection was necessary, that mere shaving off of the articular cartilage down to subchondral bone was not only enough but also essential in order to produce close linear coaptation of the resected joint surfaces and ensure prompt "primary union" of the bones.

One has to become familiar with this bean-shaped joint, which measures almost 1⅛ inches (2.9 cm.) in dorsoplantar direction, and approximately ½ inch (1.3 cm.) from side to side in its widest dimension. It also faces plantarward and medially (Fig. 1). The articular facet of the first metatarsal is slightly concave, while that of the first cuneiform is correspondingly convexed in sagittal plane. There is also a similar concavity of the first metatarsal and convexity of the first cuneiform in the horizontal plane. A snug fitting and close approximation of the resected surfaces should be obtained. A hole is then made with a shoemaker's awl

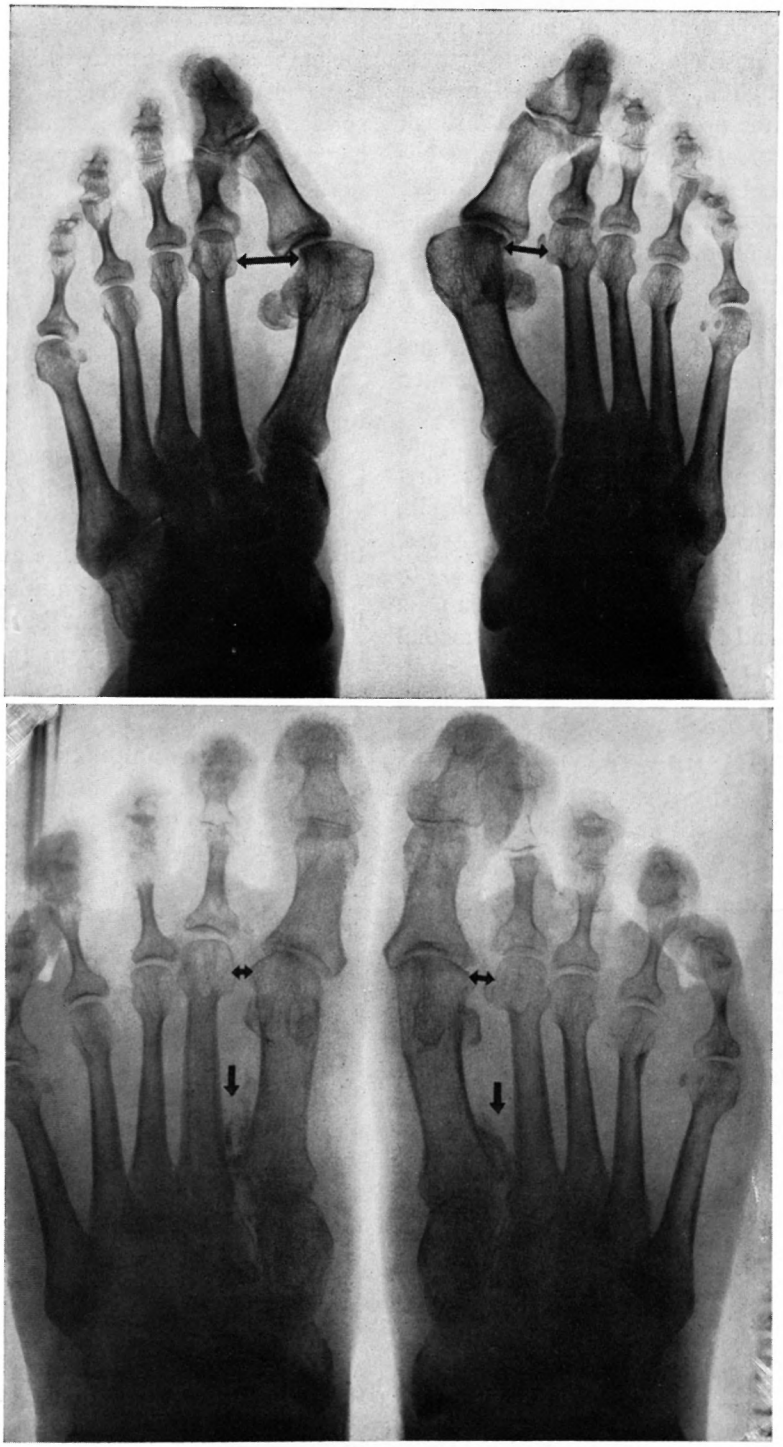


FIG. 7, A.S. (*Top*) Before operation. (*Bottom*) About 6 weeks post-operatively.

over the dorsolateral part of the first metatarsal base, and No. 0 chromic catgut is passed through it, using a curved needle. Proximally, the needle is introduced through the strong dorsal ligamentous structures between the first and the second cuneiforms. When this stitch is tied, a close approximation is maintained. The pieces of bone obtained from the first metatarsal head are denuded from soft tissue and cartilage and cut in very small bone chips, which are inserted abundantly between the denuded bases of the first and the second metatarsals. They later form a bony bridge that maintains permanently the correction of the first metatarsus varus. Skin is closed with silk without suturing the subcutaneous tissues. A 5-inch (about 12 cm.) long and 5/16-inch (7 mm.) wide steel corset stay is used as a splint and is inserted along the medial aspect of the first metatarsal over well-padded dressing. The big toe is strapped to it at about 10° of varus and in slight external rotation. The first dressing should be done snugly, but not too tightly. After adequate correction, one will find on postoperative roentgenograms complete correction of metatarsus varus primus without tight bandaging across the forefoot. Likewise, the splinting of the big toe should be done most carefully in order to avoid pressure over the suture line. This is very important. One should depend primarily on an adequate surgical correction, the splinting being aimed only at maintaining it, rather than on increasing the correction.

Since the introduction of the antibiotics we have applied an antibiotic ointment routinely to the suture line* and also given the patient an antibiotic starting from one day before the operation and continuing for about 1 week postoperatively. It was noted that better wound healing was gained with prophylactic use of the antibiotics. Particularly, the wound over the bunion showed a more frequent tendency to form stitch abscesses and to separate in our early cases, and that tendency appeared to be greatly decreased by the antibiotics. There was not a single case of true infection in our latest

* Lately we have been using only Telfa.

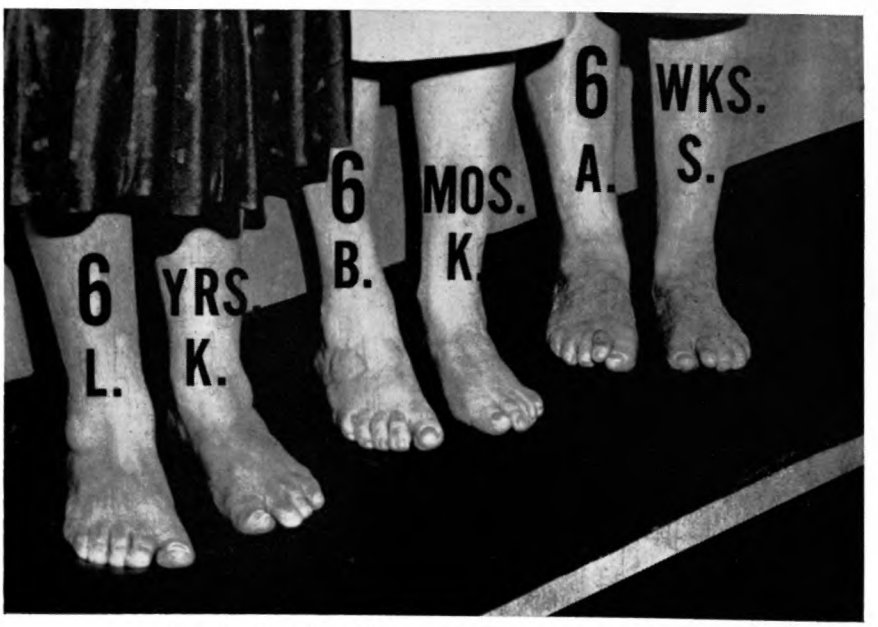
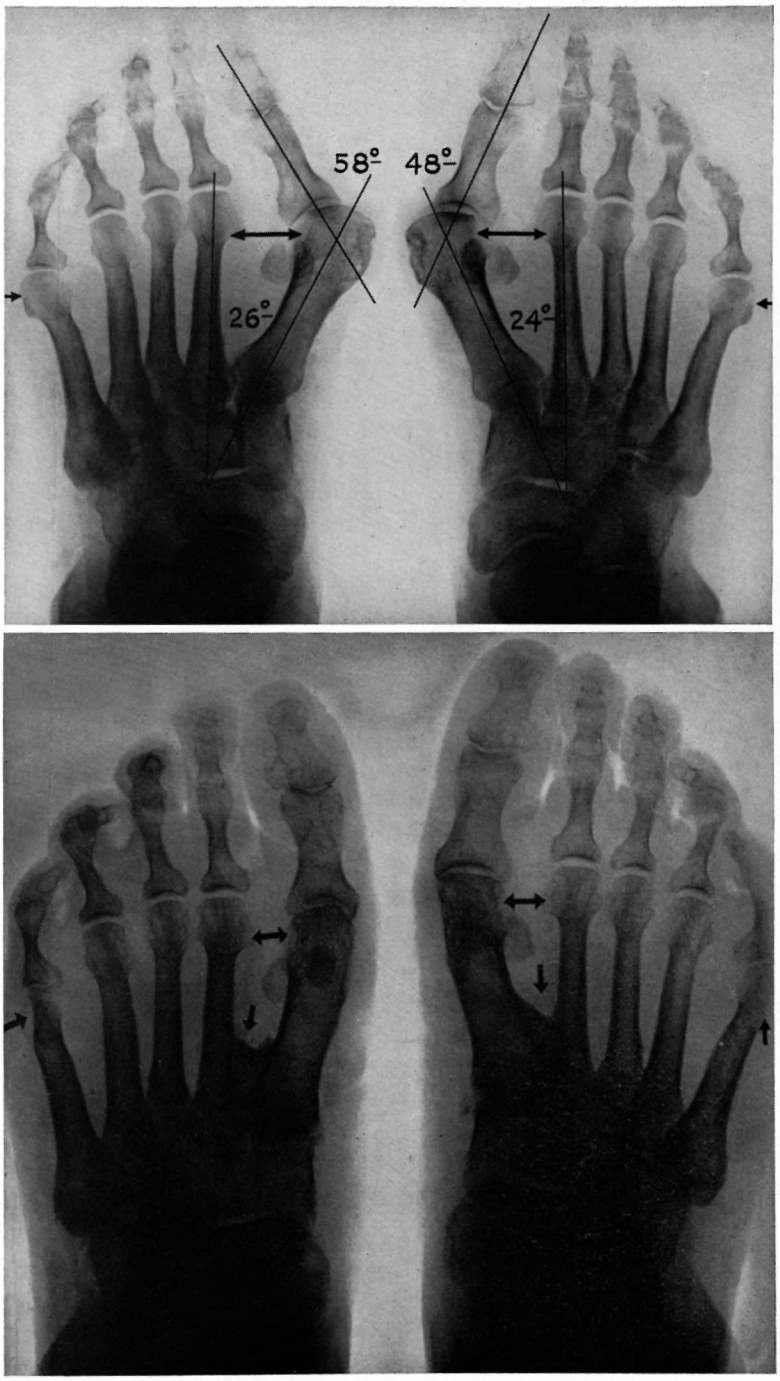


FIG. 8. Result at the time stated after operation.



FIGS. 9 and 10, H.H., a 52-year-old female with metatarsus varus primus of 26° on the right and 24° on the left, and right hallux valgus of 48° and left of 58°. FIG. 9 (*Top*) Preoperative roentgenograms of both feet showing very marked deformity. (*Bottom*) Same feet about 2½ years after the operation performed on November 4, 1953. Note the heavy bone bridge between the first and the second metatarsals. Lateral prominence of both fifth metatarsal heads was also removed (arrow). (Lapidus, P. W.: Bull. Hosp. Joint Dis. **17**:404)

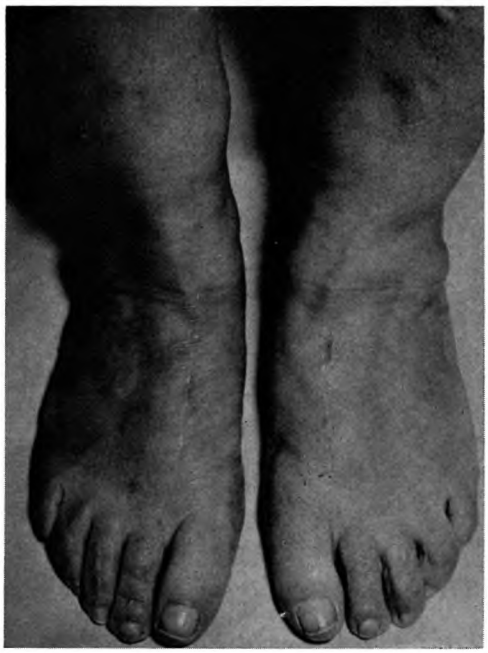


FIG. 10. Both feet on February 13, 1956, 2½ years after the operation. Patient still has very satisfactory correction at the present time. (Lapidus, P. W.: Bull. Hosp. Joint Dis. 17:404)

(treated with antibiotics) cases. In two cases there was pressure necrosis of the soft tissue over the bunion; in one of these (not done by the author), a satisfactory result and complete healing were obtained 4 months after the operation. The second case subsequently developed involvement of the bone of the base of the proximal phalanx of one big toe that later required resection of the Keller-Brandes type. The postoperative disability lasted on and off for about 1 year, and the final result after the Keller-Brandes operation on one foot was considered to be unsatisfactory by our standards. Although we had only two cases with this complication in our large series, we recommend most careful postoperative after-care, especially during the first postoperative week. Usually we change the dressing on the second or the third postoperative day and replace carefully the steel corset stay, maintaining the big toe at 10° of varus. A great number of our patients have been able to go to the bathroom bearing weight on their heels on the second or the third postoperative day and were discharged from the hospital at the end of the first week after operation. Only a few patients required the use of crutches for the first week or two. A number of housewives were able to begin some light housework 2 or 3 weeks after the operation.

The stitches usually are removed at the end of 2 weeks, and snug bandaging and adhesive strapping across the metatarsal heads over an adequate padding are continued for about 4 to 6 weeks. The splinting of the big toes may be discontinued 3 or 4 weeks after the operation, depending on the amount of correction. During the first 2 weeks there may be slight overcorrection with a few degrees of varus of the big toe. This should not be allowed to remain permanently. Control postoperative dorsoplantar roentgenograms are taken to ascertain the amount of the approximation of the first and the second metatarsal heads and the relation of the big toe to its metatarsal. Also, they show the amount of bone bridge formation between the first and the second metatarsal bases and the degree of fusion of the first cuneiformometatarsal joint. Both are usually quite solid at the end of 3 months, with subsequent roentgenograms showing further consolidation of the intermetatarsal bridge.

At first, special canvas shoes or wool socks with leather soles are worn. During the second postoperative month, the patient may wear wide soft shoes or sandals. After

FIG. 11 (*on facing page*), C.J., a 16-year-old girl. About 2 years previously, she had been operated upon elsewhere. Bilateral osteotomy (large arrows) at the first metatarsal base was performed (Mitchell's procedure) in addition to bunionectomy; also successful correction of second and third hammertoes had been performed (arrows). There was prompt recurrence of

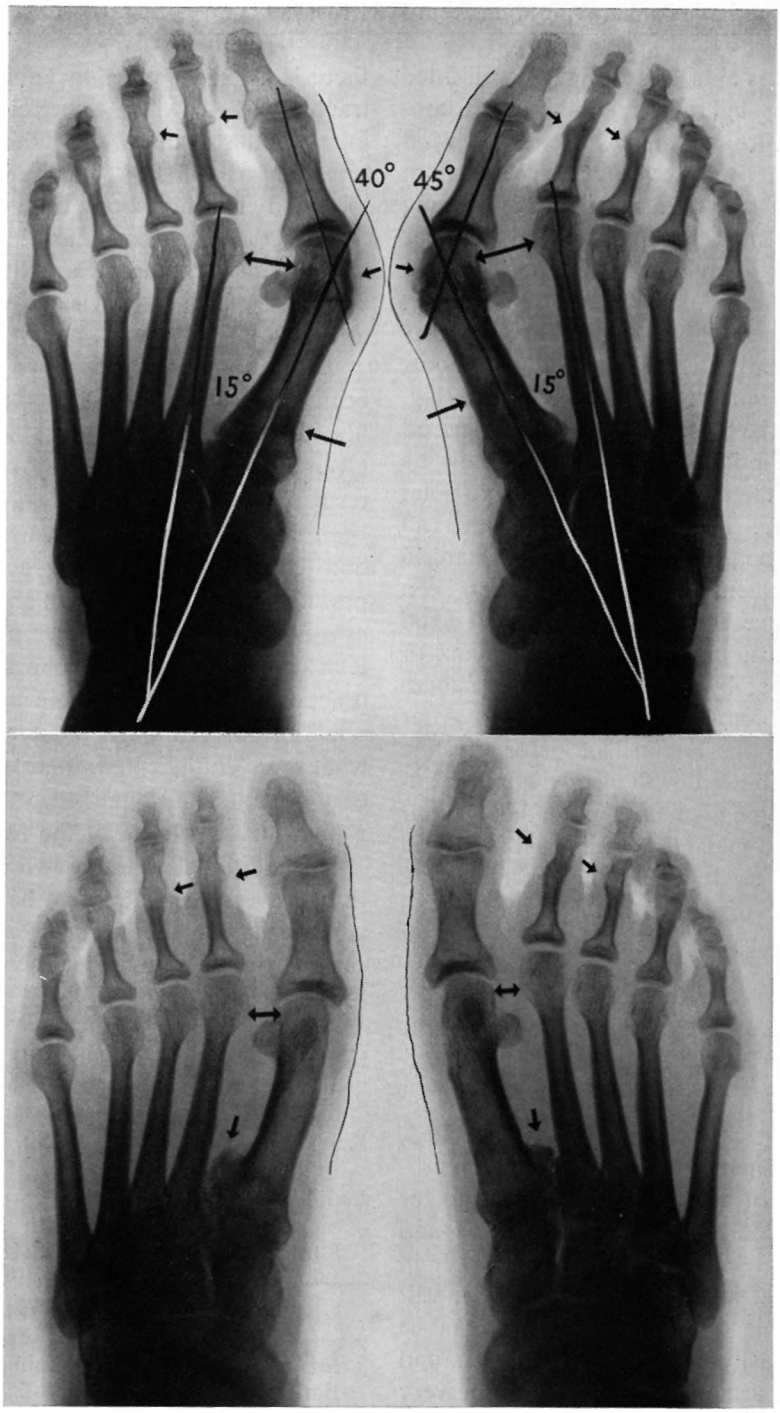


FIG. 11 (*Continued from facing page*)
bunions and extensive keloid formation over the postoperative scars (skin outline retouched over the bunions).

(*Top*) 1 year and 8 months following the first operation elsewhere. (*Bottom*) 3½ months after the second operation by the author. Note the distance between the first and the second metatarsal heads and bony bridging already present between their bases. Excellent correction is still maintained.

that time he is able to use regular well-fitted but perhaps slightly larger shoes. Housewives, as a rule, can resume their usual work about 2 months after the operation; patients having to do a great deal of walking or standing may require another week or two before going back to their 8-hour workday.

Hammertoes and overlapping hammertoes, frequently associated with bunions, usually are corrected at the same sitting. Essentially, the technic used is that described by the author in 1939, except that now he also resects the distal 3 mm. of the proximal phalanx, care being taken to remove all prominent bone edges and to establish proper alignment of the toe. He has been able to reduce the sometimes present fixed dorsal subluxation of the basal phalanx of the lesser toes by a thorough dorsal subcutaneous tenotomy and capsulotomy. After correction of the hammertoe deformity, the toe is immobilized with gently applied adhesive strapping, maintaining the plantar flexion at the metatarsophalangeal joint and dorsiflexion at the interphalangeal joints, care again being taken not to produce any ischemic changes.

SUMMARY

A very large number of our bunion cases were treated conservatively and required no surgery.

When surgical correction was indicated, we used our modification of the Silver procedure, consisting of anchoring the abductor hallucis tendon into mediocapsular flap and thereby supplying active muscular power in addition to a passive correction of the valgus of the big toe. This operation can be performed easily under local anesthesia and needs no tourniquet. It may give a very satisfactory result in cases without metatarsus varus primus or when the varus of the first metatarsal is not very extensive and is correctible.

In cases with pronounced and unreducible metatarsus varus—in other words, when there is a fixed abduction (tibialward) contracture of the first cuneiformometatarsal joint—better results were obtained following resection of the first cuneiformometatarsal joint and creating a bony bridge between the first and the second metatarsal bases in order to maintain permanent correction. This procedure is especially advisable in robust and not too old individuals.

Our present-day operative technic has been described in detail. Our operation, first performed on April 8, 1931, has been given adequate trial over the years, and our results—particularly in recent years—have been most gratifying and warrant continuation of our surgical approach in bunion problems. The popular Keller-Brandes type operation is a much simpler procedure, but it seldom, if ever, results in restoration of practically normal anatomic and functional relationship. Although our technic is somewhat more complicated, it certainly is within easy reach of any qualified orthopaedic surgeon with knowledge of the foot.

An additional week or two of postoperative recovery seems to us to be a very sound investment for the ultimate results in our cases reviewed years after the operation.

BIBLIOGRAPHY

Haines, R. W., and McDougall, A.: The anatomy of hallux valgus, J. Bone & Joint Surg. **36-B**:272-293, 1954.

Kaplan, E., and Nelson, L. S.: Hallux valgus, Bull. Hosp. Joint Dis. **3**:17-25, 1942.

Lapidus, P. W.: Operative correction of the metatarsus varus primus in hallux valgus, Surg., Gynec. & Obst. **58**:183-191, 1934.

———: Operative correction of hammer-toe, J. Bone & Joint Surg. **37**:977-982, 1939.

———: Transplantation of extensor tendon for correction of overlapping fifth toe, J. Bone & Joint Surg. **40**:555-559, 1942.

———: Anthropology and orthopaedic surgery, Bull. Hosp. Joint Dis. **11**:174-186, 1950.

———: A quarter of a century of experience with the correction of the metatarsus varus primus in hallux valgus, Bull. Hosp. Joint Dis. **17**:404-421, 1956.

Leboucq, H.: Le développement du premier

metatarsien et de son articulation tarsienne chez l'homme, Arch. biol. 3:335, 1882.
Schultz, A. H.: The skeleton of the trunk and limbs of higher primates, Human Biol. 2:303-438, 1930.
Silver, D.: The operative treatment of hallux valgus, J. Bone & Joint Surg. 21:225-234, 1923.
Straus, W. L.: Growth of the human foot and its evolutionary significance, Contrib. Embryol. 19 (No. 101):93-134, 1927.
Timmer, H.: Die Behandlung des Hallux Valgus, Leipzig, Barth, 1930.
Truslow, W.: Metatarsus primus varus or hallux valgus? J. Bone & Joint Surg. 23:98-108, 1925.

Le Operation del Autor ab 1931 Usque 1959

Summario in Interlingua

Es discutite le tractamento del tumescentia in le bursa mucose del eminentia al pollice del pede que es hic designate per le termino anglese "bunion."

Un grande numero de nostre casos de buniones esseva tractate conservatorimente e requireva nulle intervention chirurgic.

Quando un correction chirurgic esseva indicate, nos ha servite nos de nostre modification del technica de Silver que consiste in ancorar le musculo abductor del halluce in un panno del capsula medie pro provider active fortia muscular in ultra del correction passive del pollice valge. Iste operation es facile e effectuar sub anesthesia local e non require le uso de un tourniquet. Illo produce multo satisfacente resultatos in casos sin metatarso prime varo in que le aspecto var del metatarso prime non es extense e pote esser corrigite.

In casos con metatarso marcatemente e irreducibilemente var—in altere parolas: in casos con fixate contraction abductional (verso le tibia) in le prime articulation cuneiforme-metatarsal—melior resultatos esseva obtenite per primo resectionar le prime articulation cuneiforme-metatarsal e crear un ponte ossee inter le prime e le secunde base metatarsal pro assecurar le permanentia del correction. Iste technica es specialmente recommendate in subjectos robuste e de etate non troppo avantiate.

Le technica chirurgic que nos usa currentemente es describite in detalio. Nostre operation—primo effectuate le 8 de april 1931—ha essite testate satis perennemente, e nostre resultatos (particularmente in recente annos) ha essite multo incoragiante e justifica le continue uso de nostre methodo operatori in casos de bunion problematic. Le frequentemente usate typo de operation secundo Keller-Brandes es multo plus simple, sed illo resulta rarmente—si del toto—in le restauration de practicamente normal relationes anatomic e functional. Ben que nostre technica es un pauco plus complicate, illo certo non excede le capabilitates de un qualificate chirurgo orthopedic qui possede un bon cognoscentia del pede.

Un o duo septimanas additional de recuperation postoperatori impressiona nos como un molto sage investimento de tempore si on considera le ultime resultatos que nos ha obtenite per nostre methodo a judicar secundo un revista del casos annos post le execution del operation mesme.

Exhibit 1024

W1
FO511RR
v. 19 no. 2
June 2014

linics Review Articles

AND ANKLE CLINICS
RTH AMERICA

Management of Primary and Revision Hallux Valgus

EDITOR
Andy Molloy

CONSULTING EDITOR
Mark S. Myerson

JUNE 2014

Management of Primary and Revision Hallux Valgus

Editor

ANDY MOLLOY

FOOT AND ANKLE CLINICS

www.foot.theclinics.com

Consulting Editor
MARK S. MYERSON

June 2014 • Volume 19 • Number 2

ELSEVIER

1600 John F. Kennedy Boulevard • Suite 1800 • Philadelphia, Pennsylvania, 19103-2899

http://www.theclinics.com

FOOT AND ANKLE CLINICS Volume 19, Number 2
June 2014 ISSN 1083-7515, ISBN-13: 978-0-323-29920-6

Editor: Jennifer Flynn-Briggs

© **2014 Elsevier Inc. All rights reserved.**

This periodical and the individual contributions contained in it are protected under copyright by Elsevier, and the following terms and conditions apply to their use:

Photocopying
Single photocopies of single articles may be made for personal use as allowed by national copyright laws. Permission of the Publisher and payment of a fee is required for all other photocopying, including multiple or systematic copying, copying for advertising or promotional purposes, resale, and all forms of document delivery. Special rates are available for educational institutions that wish to make photocopies for non-profit educational classroom use. For information on how to seek permission visit www.elsevier.com/permissions or call: (+44) 1865 843830 (UK)/(+1) 215 239 3804 (USA).

Derivative Works
Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution. Permission of the Publisher is required for all other derivative works, including compilations and translations (please consult www.elsevier.com/permissions).

Electronic Storage or Usage
Permission of the Publisher is required to store or use electronically any material contained in this periodical, including any article or part of an article (please consult www.elsevier.com/permissions). Except as outlined above, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the Publisher.

Notice
No responsibility is assumed by the Publisher for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made.

Although all advertising material is expected to conform to ethical (medical) standards, inclusion in this publication does not constitute a guarantee or endorsement of the quality or value of such product or of the claims made of it by its manufacturer.

Foot and Ankle Clinics (ISSN 1083-7515) is published quarterly by Elsevier, Inc., 360 Park Avenue South, New York, NY 10010-1710. Months of issue are March, June, September, and December. Periodicals postage paid at New York, NY, and additional mailing offices. Subscription price per year is $315.00 (US individuals), $421.00 (US institutions), $155.00 (US students), $360.00 (Canadian individuals), $506.00 (Canadian institutions), $215.00 (Canadian students), $460.00 (foreign individuals), $506.00 (foreign institutions), and $215.00 (foreign students). To receive student/resident rate, orders must be accompanied by name of affiliated institution, date of term, and the *signature* of program/residency coordinator on institution letterhead. Orders will be billed at individual rate until proof of status is received. Foreign air speed delivery is included in all *Clinics* subscription prices. All prices are subject to change without notice. **POSTMASTER:** Send address changes to *Foot and Ankle Clinics*, Elsevier Health Sciences Division, Subscription Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. **Customer Service: 1-800-654-2452 (US and Canada). From outside of the United States and Canada, call 314-447-8871. Fax: 314-447-8029. E-mail: JournalsCustomerService-usa@elsevier.com (for print support); JournalsOnlineSupport-usa@elsevier.com (for online support).**

Reprints. For copies of 100 or more, of articles in this publication, please contact the Commercial Reprints Department, Elsevier Inc., 360 Park Avenue South, New York, NY 10010-1710. Tel.: 212-633-3874; Fax: 212-633-3820; E-mail: reprints@elsevier.com.

Printed in the United States of America.

Contents

Preface: Management of Primary and Revision Hallux Valgus ix

Andy Molloy

Scarf Osteotomy 165

Andy Molloy and James Widnall

The term scarf osteotomy was first used by Weil when presenting his results from more than 1000 cases. Scarf is a carpentry term describing beveling the ends of 2 pieces of wood and securely fastening them so that they overlap to create one continuous piece. This technique was popularized by Weil and Barouk as a versatile method of correcting hallux valgus while maintaining the blood supply to the metatarsal head. It also has rigid fixation, allowing early mobilization. This article addresses the surgical technique of the scarf osteotomy together with the results and complications of hallux valgus correction.

Minimally Invasive Osteotomies 181

David Redfern and Anthony Michael Perera

As orthopedic surgery continues to head in the direction of less invasive surgical techniques, this article explores the application and evolution of minimally invasive/percutaneous techniques in the surgical correction of hallux valgus deformities. Modern techniques are described and available literature is reviewed.

Correction of Moderate and Severe Hallux Valgus Deformity with a Distal Metatarsal Osteotomy Using an Intramedullary Plate 191

Ezequiel Palmanovich and Mark S. Myerson

More than 200 surgeries have been described for hallux valgus correction. The distal V-shape chevron-type osteotomy was described with no more than 50% translation of the distal fragment in relation to the metatarsal shaft. This concept of high, powerful correction for distal chevron osteotomy fixed by the Mini MaxLock Extreme ISO gives the surgeon the possibility of a mini-invasive rapid solution. A new technique of fixation is based on the Murawski and Beskin concept, because a powerful correction can be performed with a minimally invasive approach, but, in contrast to other studies, with stable osteotomy fixation.

Rotational and Opening Wedge Basal Osteotomies 203

Paulo N. Ferrao and Nikiforos P. Saragas

There are more than 150 different procedures described for correction of the hallux valgus deformity, the treatment of which is usually guided by severity. Moderate to severe hallux valgus has traditionally been managed with a shaft or proximal osteotomy together with distal soft-tissue release. Proximal osteotomies can be classified as translation or rotational.

Rotational osteotomies such as the Ludloff and proximal opening wedge have not been popular historically because of instability from lack of fixation, resulting in complications. This article describes modified techniques with modern fixation of these 2 osteotomies, which offer stable fixation and reproducible results.

The Modified Lapidus Fusion **223**

Timo Schmid and Fabian Krause

Due to its proximal correction site and long lever arm, the Lapidus fusion, modified or not, is a powerful technique to correct hallux valgus deformities. The disadvantages are a high complication rate and a long postoperative rehabilitation period. It is only performed in 5% to 10% of all hallux valgus deformity corrections but remains, however, an important procedure, especially in moderate to severe deformities with intermetatarsal angles more than 14°, hypermobility of the first ray, arthritis of the first tarsometatarsal joint, and recurrent deformities. This article provides an overview of the procedure with special focus on the surgical technique.

Pediatric Hallux Valgus **235**

Julian Chell and Sunil Dhar

Hallux valgus in children is a relatively uncommon deformity, also known by several other names such as juvenile or adolescent bunion, metatarsus primus varus, and metatarsus primus adductus. The presence of an open growth plate is considered by most to be part of the definition of this condition. However, others include patients up to age 20 years, owing to the plastic nature of the various components of the condition. The presenting complaint is invariably of the bunion and its cosmetic appearance. Treatment should be conservative and surgery avoided till skeletal maturity is achieved due to the high incidence of recurrence in children.

First Metatarsophalangeal Arthrodesis for Hallux Valgus **245**

Edward V. Wood, Christopher R. Walker, and Michael S. Hennessy

Arthrodesis of the first metatarsophalangeal joint is a reliable operation in the treatment of selected cases of hallux valgus. It corrects deformity of hallux valgus and metatarsus primus varus, leading to good functional results with a low complication rate. It is a technique well suited to patients with hallux valgus associated with degenerative changes or severe deformity, and those for whom primary hallux valgus surgery has failed.

Recurrence of Hallux Valgus: A Review **259**

Steven M. Raikin, Adam G. Miller, and Joseph Daniel

Recurrence of hallux valgus deformity can be a common complication after corrective surgery. The cause of recurrent hallux valgus is usually multifactorial, and includes patient-related factors such as preoperative anatomic predisposition, medical comorbidities, compliance with postcorrection instructions, and surgical factors such as choice of the appropriate procedure and technical competency. For a successful outcome, this cause must be ascertained preoperatively. Although the algorithm to

determine which intervention should be used is not unlike that of primary hallux valgus surgery, operative correction of hallux valgus recurrence can be challenging. This article discusses these challenges, complications, causes, and techniques.

The Treatment of Iatrogenic Hallux Varus 275

Mark B. Davies and Chris M. Blundell

Though uncommon, iatrogenic hallux varus is most often the result of overresection of the medial eminence, overtranslation of an osteotomy, overrelease of the lateral soft tissues, or overtightening of the medial tissues. It is not always symptomatic, as the degree of deformity can be well tolerated. For soft-tissue reconstructions, releases have little role to play unless minor deformity is detected early on and the longevity of tendon transfer and tenodesis remains unknown. For bony reconstruction, arthrodesis is the recommended salvage technique.

Transfer Metatarsalgia Post Hallux Valgus Surgery 285

Ernesto Maceira and Manuel Monteagudo

Metatarsalgia, pain around the metatarsophalangeal joints, may arise from mechanical causes spontaneously or iatrogenically. Nonunion or malunion of the first metatarsal can transfer weight-bearing forces and overload the lesser metatarsals. Transfer metatarsalgia after failed hallux valgus surgery is troublesome and more prevalent than would be expected. Clinical examination of the patient allows identifying the type of transfer metatarsalgia and pathomechanics involved. This review focuses on transfer metatarsalgia after hallux valgus surgery and provides a basic understanding of the pathomechanics, clinical examination, and image studies. It also addresses the options for both conservative and surgical treatment of this challenging condition.

Treatment of Shortening Following Hallux Valgus Surgery 309

Andrew Goldberg and Dishan Singh

Transfer metatarsalgia is a recognized complication following hallux valgus surgery, usually as a result of shortening of the first metatarsal. In this article, the authors present an overview of the incidence, presentation, and treatment strategies employed in its management.

Index 317

This material may be protected by Copyright law (Title 17 U.S. Code)

The Modified Lapidus Fusion

Timo Schmid, MD, Fabian Krause, MD*

KEYWORDS

• Hallux valgus • Modified Lapidus procedure • Metatarsocuneiform fusion
• Technique

KEY POINTS

- Due to its very proximal correction site and long lever arm, the Lapidus fusion, modified or not, is a powerful technique to correct hallux valgus deformities.
- The disadvantages are a high complication rate and a long postoperative rehabilitation period. Therefore, it is currently only performed in 5% to 10% of all hallux valgus deformity corrections.
- Lapidus fusion remains an important procedure, especially in moderate to severe deformities with intermetatarsal angles more than 14°, hypermobility of the first ray, arthritis of the first tarsometatarsal joint (TMTJ), and recurrent deformities.
- Every surgeon dealing with forefoot deformities encounters cases when the Lapidus procedure is a viable option.

INTRODUCTION: NATURE OF THE PROBLEM

In 1911 and more than 20 years before Lapidus published his technique, Albrecht[1] first described a first metatarsocuneiform fusion for correction of hallux valgus deformity. In 1925, Truslow[2] introduced the term, *metatarsus primus varus*, pointing out that the primary deformity of the hallux valgus in these cases is located at the proximal end of the first ray. He stated that any operative procedure that does not incorporate the correction of the deformity at its proximal origin is unscientific and inadequate. In 1932, Kleinberg[3] identified the obliquity of the first TMTJ and the consequent adduction of the first metatarsal as the ultimate cause in the etiology of hallux valgus.

It was not until 1934 that Lapidus described his technique. And although Lapidus himself stressed that he did not introduce a new principle, it is his name that is closely connected to the procedure.[4]

The original technique consisted of an arthrodesis of the first cuneiform-metatarsal joint and the first intermetatarsal joint. The fixation was achieved by simply sewing the

Department of Orthopaedic Surgery, Inselspital, University of Berne, Freiburgstrasse, Bern 3010, Switzerland
* Corresponding author.
E-mail address: fabian.krause@insel.ch

Foot Ankle Clin N Am 19 (2014) 223–233
http://dx.doi.org/10.1016/j.fcl.2014.02.005
1083-7515/14/$ – see front matter © 2014 Elsevier Inc. All rights reserved.

joint capsules with catgut. Later, fixation by crossed screws was introduced by Clark and colleagues[5] and led to a modified technique without intermetatarsal fusion.

Despite Truslow's statement, the original or the modified Lapidus technique is done in barely 10% of all hallux valgus corrections. This is likely due to a longer postoperative rehabilitation period and a higher complication rate as opposed to other techniques, particularly more distal procedures. The Lapidus procedure is a technically demanding operation: with its long lever arm, the procedure is prone to over- or undercorrection and nonunion.[6]

INDICATIONS/CONTRAINDICATIONS

According to most investigators, a distal bunion procedure is thought insufficient when the intermetatarsal angle exceeds 15° (**Table 1**). Any type of proximal metatarsal osteotomy or the more proximal tarsometatarsal arthrodesis is preferred in these cases.

Hypermobility of the first ray in the TMTJ, as originally suggested by Morton in 1928,[7] continues to be an important indication. Proper measurement of this instability remains, however, difficult. Plantar gapping of the first TMTJ on a lateral weightbearing radiograph seems to be a reliable sign. Clinical evaluation is highly subjective, however, and objective measurement with external calipers is inconvenient in daily practice.[8,9]

Hallux valgus deformity with accompanying arthritis of the first TMTJ can be treated by one single procedure with a Lapidus fusion.

Recurrence after hallux valgus correction is a difficult situation for both patient and surgeon. The Lapidus procedure can provide good correction and high satisfaction rates in this setting.[10,11]

Because the epiphysis of the basis of the first metatarsal contributes to approximately 50% of the length growth of the first ray,[12] a juvenile hallux with open epiphysis is a contraindication.

Potential athletic activity has to be taken into consideration, because only 30% of athletes with a stiffened first ray return to their preoperative level of activity after a metatarsocuneiform fusion. In contrast, 75% of the more sedentary patients achieve this goal.[13] Arthritis of the adjacent joints (eg, first metatarsophalangeal joint [MTPJ]

Table 1
Indications/contraindications

	Indications	Comments
Frequent	Moderate to severe deformity	Intermetatarsal angle >15°
	Hypermobility of the first ray	Plantar gapping of TMTJ 1 on lateral radiograph
	Generalized hyperlaxity	Beighton score >5
Rare	Recurrent hallux valgus	Satisfaction rate 80%
	Juvenile hallux valgus	Only when growth plate is closed
	TMT 1 arthritis	
	Contraindications	**Comments**
Absolute	Arthritis of the first MTPJ	
	Juvenile hallux valgus	Open growth plate
Relative	Short first metatarsal	Consider bone block interposition
	Young active patient	Only 30% achieve preoperative activity level
	Smoker	Higher nonunion rate

and naviculocuneiform) is a relative contraindication because the restricted motion and the enlarged lever arm may lead to an aggravation of a preexisting arthritis.

The Lapidus procedure should be used cautiously in smokers because smoking has proved to negatively influence the union rate.

Even with accurate joint denudement, there is shortening of the first ray. Therefore, a preexistent short first metatarsal is a relative contraindication. With a bone block interposition, a surgeon can overcome this shortening.[6,14]

SURGICAL TECHNIQUE/PROCEDURE

Preoperative Planning

Prior to the Lapidus procedure, a complete and thorough history, clinical examination, and radiographic work-up are mandatory. The following points are useful to determine whether a Lapidus procedure is a good option:

- Pain at the medial Lisfranc joint indicating Lisfranc arthritis, general hyperlaxity, an older sedentary patient, and recurrence after previous hallux valgus correction support a Lapidus procedure.
- Pain in the first MTPJ indicating first MTPJ arthritis, an athletic activity, and nicotine abuse should lead to consideration of other options.
- Clinical examination aims to detect a first ray hypermobility or a generalized hypermobility. Morton first described how to test the first TMTJ instability: with the patient sitting, the knee flexed and the ankle in neutral position, one hand stabilizes the lateral 4 metatarsals, whereas the other hand moves the first ray from dorsomedial to plantar-lateral. The mobility is compared with the contralateral side.[7] This subjective method, however, was shown invalid.[15] To more objectively quantify hypermobility, external calipers, like the Klaue device, may be used.[16] With this device, the first metatarsal head was elevated 9.3 mm ($\pm$1.9 mm) in patients with a hallux valgus as opposed to 5.4 ($\pm$1.4 mm) in the control group in a clinical study.

Intractable plantar keratoses underneath the second metatarsal head or on the dorsum of the first metatarsal head also indicate first TMTJ instability. The measurement of this instability, however, remains imprecise and subjective.

- General joint laxity can be estimated with a Beighton score, which consists of 9 stability assessments: ability to put the hands flat on the ground with straight knees (1 point), hyperextending both elbows (each 1 point) and knees (each 1 point), and bending both thumbs back on the front of the forearms (each 1 point) and both little fingers 90° to the back of the hands (each 1 point).[17] A score of 5 or more indicates significant ligamentous instability.
- Tenderness under palpation and passive motion indicates arthritis of the first TMTJ and the first MTPJ.
- Radiographic work-up consists of weight-bearing dorsoplantar and lateral radiographs. A severe deformity with an intermetatarsal angle greater than 15° and arthritis of the first TMTJ on the dorsoplantar view supports a Lapidus procedure. In contrast, a short first metatarsal, an open growth plate, and arthritis of the first MTP joint are contraindications. Regarding first ray hypermobility, Morton[7] stated that bony hypertrophy of the second metatarsal indicates instability of the first TMTJ, but Grebing and Coughlin[18] were not able to confirm this finding. No association of second metatarsal shaft width and medial cortical hypertrophy with hallux valgus, first ray mobility, or first metatarsal length was seen.

Normally, the first metatarsocuneiform joint is orientated slightly medial, but occasionally it may have an excessive degree of medial inclination. This leads to

a metatarsus primus varus deformity, and a hallux valgus deformity is more common.[2,19–22]

In approximately 8% of patients, an os intermetatarseum is present.[8] It is often accompanied by a rigid first tarsometatarsal articulation that blocks reduction of the 1 to 2 intermetatarsal angle by distal soft tissue repair or distal metatarsal osteotomy and may indicate a Lapidus procedure.

- In approximately 20% of cases of moderate to severe hallux valgus deformity, a gap of the plantar aspect of the first TMTJ on the lateral view is seen that is associated with hallux valgus or first metatarsocuneiform joint instability.[8,9,23] It is obvious in a majority of cases and an objective sign for the often-quoted first ray instability.

Authors' Preferred Technique

The patient is placed in a supine position, sometimes with a bolster under the ipsilateral buttock allowing correct rotation of the foot. Appropriate visualization and safe dissection are ensured either by a sterile Esmarch rubber bandage at the ankle level or a tourniquet inflated to 350 mm Hg at the thigh.

- The first TMTJ is approached through a 5-cm longitudinal incision centered over the dorsomedial aspect of the joint. The accompanying distal soft tissue procedure is performed via a 3- to 4-cm longitudinal incision centered between the first and second MTPJs and a 3- to 4-cm longitudinal incision on the medial aspect of the first MTPJ.

A release of the adductor tendon and the transverse metatarsal ligament is carried out in the first web space. The lateral MTPJ capsule is perforated with several puncture wounds and disrupted by medial angulation of the toe. Medially, the joint capsule is prepared and opened horizontally and the medial bony eminence is removed. The removal of the eminence is a standard step with a resection of 2 to 4 mm in width, superior more than inferior, and without violating the medial sesamoid groove.

The joint capsule of the first TMTJ is approached retracting the extensor hallucis longus tendon laterally. The joint is opened dorsally and medially. If a fusion of the bases of the first and second metatarsal is planned, the joint is approached via the interval between the extensor halluces longus and brevis tendons. Care has to be taken not to harm the neurovascular bundle (the dorsalis pedis artery and deep peroneal nerve).

- The joint is exposed with 2 Hohmann retractors to protect the anterior tibial tendon on the medial side and the neurovascular bundle on the lateral side. With an osteotome and a small curette, the articular cartilage is completely removed. The joint is sinusoidal-shaped and 30 mm in height. Therefore, removing all cartilage of the plantar lateral aspect can be somewhat difficult. A small lamina spreader or a Kirschner wire distractor is useful to better expose the most plantar part of the joint. By resection of a small plantarly and laterally based wedge, better correction of excessive valgus and mild plantar flexion is achieved (**Fig. 1**). Alternatively, a minimal saw cut at the articular surface of the cuneiform with a small plantarly and laterally based wedge can be done if the first metatarsal is not already short.
- For a fusion of the first intermetatarsal joint, the corresponding articular surfaces are also prepared (as discussed previously). During this dissection, the penetrating branch of the dorsalis pedis artery has to be protected. Usually the authors prefer the modified Lapidus technique with simple fusion of the first

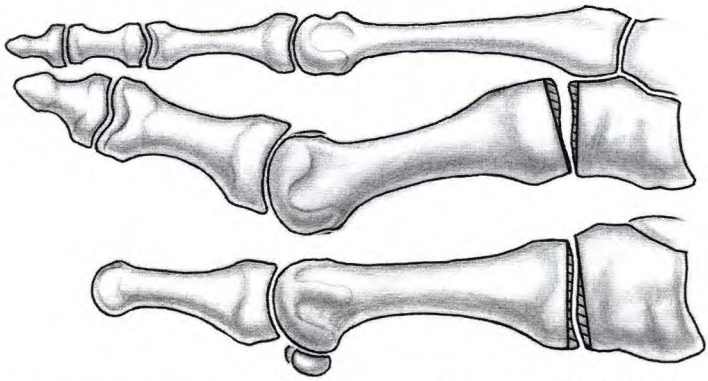


Fig. 1. By resection of a small plantarly and laterally based wedge, better correction of excessive valgus and mild plantar flexion is achieved.

TMTJ and only perform this intermetatarsal arthrodesis in cases of a nonunion or presence of an os intermetatarseum.

- The subchondral bone is opened by feathering with an osteotome and multiple 1.5-mm drill holes on both sides of the arthrodesis.
- The joint is gently manipulated from a dorsomedial to a plantar lateral position, thus respecting the joint's biomechanical axis. The first metatarsal is then reduced to close the intermetatarsal angle. Generally, there is a tendency to undercorrect the metatarsal plantarflexion. Too much dorsiflexion of the first ray may lead to transfer metatarsalgia of the second ray. If appropriate plantarflexion cannot be achieved, the plantar lateral aspect of the joint should be revisualized to ensure that the joint is correctly prepared. It is relatively easy to leave residual cartilage or bony fragments on the plantar lateral of the joint aspect, which impede correct positioning. Local bone graft obtained from the medial MTP joint eminence may be placed into the arthrodesis site if there are any defects present. The correct alignment and rotation is fixed with a preliminary Kirschner wire. It is imperative that this checked both clinically and fluoroscopically.

Fixation with 2 crossed 3.5-mm lag screws is usually sufficient. A notch at the entry point of the distal screw prevents a fracture of the dorsal proximal cortex of the first metatarsal (**Fig. 2**). Without the notch, the screw levers the metatarsal cortex dorsally when cortical contact of the screw head forces it upwards. For the notch, a triangle of six 2.5-mm drill holes is created and the cortex surrounded by the drill holes is removed with a rongeur (**Fig. 3**). The medial cuneiform has a width of

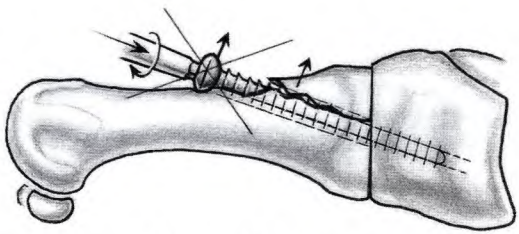


Fig. 2. A notch at the entry point of the distal screw prevents a fracture of the dorsal proximal cortex of the first metatarsal.

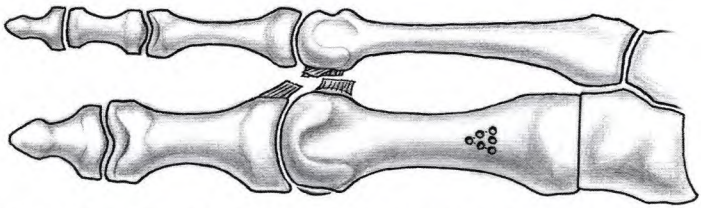


Fig. 3. For the notch, a triangle of six 2.5 mm drill holes is created and the cortex surrounded by the drill holes is removed with a rongeur.

approximately 1.5 cm. Appropriate aiming of the drill is crucial to correctly place the screws and to avoid violation of the intercuneiform joint. Drilling parallel to the medial border of the foot helps direct the drill in axis of the cuneiform. A 3.5-mm gliding hole is created. To allow more lateral correction of the first metatarsal, the 2.5-mm drill can then be directed in the cuneiform slightly more medially than the gliding hole (**Fig. 4**). A second screw is inserted from proximal to distal, aiming distally for the lateral plantar first metatarsal cortex. The screws should not cross within the fusion but rather distally to it, thus adding rotational stability. Dorsiflexion of the first MTPJ while inserting the screws improves compression at the arthrodesis site by tensioning the plantar fascia.

- The capsular tissues on the medial MTPJ are double-breasted for satisfactory alignment of the hallux. At this point, the deformity should be fully corrected. Any correction with dressings is not sufficient to prevent long-term recurrence. If there is residual deformity, the surgeon needs to ascertain the reason for this through clinical and flourscopic examination. Providing the arthrodesis has been fixed in the correct position, the most common reason is hallux interphalangeus. In this situation, an Akin osteotomy can be performed.
- The incision is then closed in layers. A compression dressing and a below-knee cast are applied.

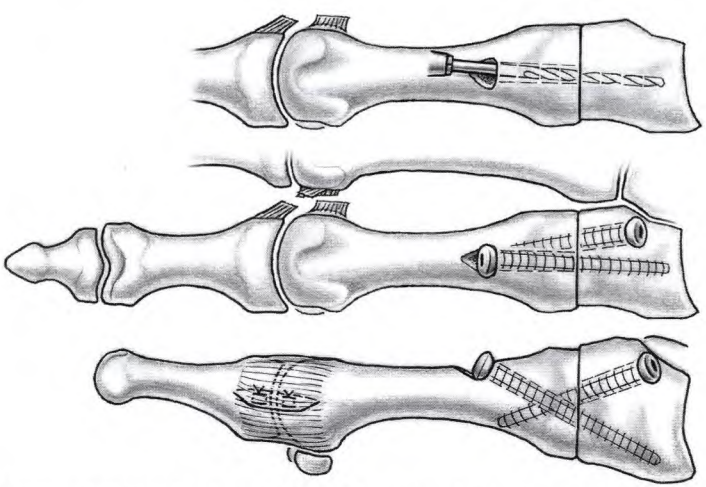


Fig. 4. A 3.5-mm gliding hole is created. To allow more lateral correction of the first metatarsal, the 2.5 mm drill can then be directed in the cuneiform slightly more medially than the gliding hole.

POSTOPERATIVE CARE

A compression dressing is removed 1 to 2 days after surgery and a below-knee cast is applied for 8 weeks. Patients are kept non–weight bearing for 4 weeks. The authors keep patients 10 to 20 kg partial weight bearing for the next 4 weeks.[24] Patients are then allowed transition to full weight bearing in regular shoes after this 8-week period of cast immobilization. In order to ensure progression of healing, the authors obtain dorsoplantar and lateral radiographs after 4 and 8 weeks.

Most investigators recommend non–weight bearing in the first 6 to 8 weeks after the procedure. Newer and stronger implants may provide more primary stability and, therefore, allow a shorter period of immobilization or immediate partial weight bearing postoperatively. Even full weight bearing 2 weeks after the procedure was described to have no adverse effects on alignment or the rate of osseous union.[25–27] Nevertheless, in biomechanical studies, most of these locking plates failed to demonstrate a stronger fixation than the crossed screw technique.[5,28–30] The downside of locking plates is the amount of hardware present in an area with little subcutaneous tissue. It is the authors' belief that locking plates have a greater potential for necessity of hardware removal. Even 2 crossed screws, however, cause implant-related problems in up to 20%.[31]

Because of the poor ratio of the long metatarsal lever arm and the small fusion surface, the authors do not recommend that patients be permitted to weight bear at an earlier stage. This cautiousness is supported by higher nonunion rates in several studies with early weight bearing as well as higher nonunion rates in simultaneous bilateral Lapidus fusion.[6,32]

Therefore, the classic construct of 2 crossed screws and an immobilization of 6 to 8 weeks still seems the gold standard. The authors' experience with this approach is generally good, and patients accept the longer period of cast immobilization and walking on crutches without complaints.

COMPLICATIONS AND MANAGEMENT

- The most common complication after a Lapidus procedure is nonunion. Rates from 2% to 10% are reported in the literature. In simultaneous bilateral operations, the rate even raises up to 33%.[6] Approximately 50% of the patients with nonunions are symptomatic and require revision.[33] Smoking is proved to have a major impact[11]; therefore, smoking is a relative contraindication for a Lapidus procedure in heavy smokers. Patients are informed about these risks and asked to stop or at least cut down smoking, but the authors do not cancel the surgery unless it is a revision surgery.

Table 2
Complications and management

Complications	Frequency (%)	Of Note
Nonunion	2–10[5,6,13,14,24,32,35,38–40]	Simultaneous bilateral operation: 33%[6] Symptomatic in 50%[33]
Transfer metatarsalgia	4–5[11,41]	Due to malalignment/shortening
Malunion	0–10[6,32,36]	
Hallux varus	0–16[39,40]	Mostly caused by excessive lateral release of the MTPJ 1
Recurrence	0–16[6,11,14,32,34,39,42]	

Table 3
Outcomes

Outcome	Rate/Range	Of Note
Reduction of HV angle	10°–22°[10,32,34,36,40]	
Reduction of IMT 1–2 angle	6°–9°[10,32,34,36,40]	
Patient satisfaction rate	74%–96%[3,5,32,34,42,43]	When performed after recurrence: 81%[11] Depending on[13] reduction of first intermetatarsal angle, first MTPJ dorsiflexion >45°, and proper sagittal alignment
Shortening of the first ray	2.9 mm–8 mm[6,11,13,37,41,44]	Management: 5–10 mm: plantarflexion of the first ray >10 mm: Weil osteotomies of second/third ray >20 mm: lengthening with bone graft
Subjective foot stiffness	8%–18%[5,32,36]	
Prolonged pain/swelling	Up to 16%[41]	Usually subsides after 3 mo

- In the presence of a painful nonunion, the authors recommend revision with autologous cancellous bone graft interposition and strong fixation, including fusion of the basis of the first and second metatarsals as originally described by Lapidus.
- Malalignment typically results in shortening and dorsiflexion of the first metatarsal and may lead to transfer metatarsalgia of the second and/or third rays.[14,34,35] It occurs in up to 10% of the cases.[36] It is, therefore, essential that accurate joint preparation is performed and that excessive wedges are not taken from the joint. Interposition of the resected medial eminence helps to prevent significant shortening if there is already a relatively short metatarsal or excessive bone has been resected.[37] A shortening of less than 5 mm with correct position usually does not cause problems. For shortening of 5 to 10 mm, a slight plantarflexion of the first metatarsal suffices to prevent problems. In cases of more than 10 mm, shortening metatarsal osteotomies (eg, Weil osteotomy) of the second and third toe can prevent transfer metatarsalgia. In cases of 20-mm and more first metatarsal shortening, however, a reconstruction of the first ray with a tricortical bone graft is used to adequately restore the correct length (**Tables 2** and **3**).[10]

SUMMARY

- The idea of the modified Lapidus procedure is to correct the hallux valgus where the primary deformity, the metatarsus primus varus, occurs.
- The Lapidus procedure is the most proximal site for forefoot correction and, therefore, offers more power than all metatarsal osteotomies.
- Accounting for 5% to 10% of all hallux valgus corrections, the modified Lapidus procedure is currently mainly used in severe deformities, deformity recurrences, first metatarsocuneiform arthritis, and hypermobility of the first ray.

- Because of its power and the demanding surgical technique, the procedure is prone to complications, which occur in approximately one-fourth of patients.
- With an appropriate surgical technique, good results can be expected, even when used for revision cases.
- Fixation with crossed screws and immobilization for 6 to 8 weeks still seem to be the gold standard.

REFERENCES

1. Albrecht GH. The pathology and treatment of hallux valgus. Russ Vrach 1911;10:14.
2. Truslow W. Metatarsus primus varus or hallux valgus? J Bone Joint Surg Am 1925; 7:98–108.
3. Kleinberg S. The operative cure of hallux valgus and bunions. Am J Surg 1932; 15:75–81.
4. Lapidus PW. Operative correction of the metatarsus varus primus in hallux valgus. Surg Gynecol Obstet 1934;58:16.
5. Clark HR, Veith RG, Hansen ST Jr. Adolescent bunions treated by the modified Lapidus procedure. Bull Hosp Jt Dis Orthop Inst 1987;47:109–22.
6. Sangeorzan BJ, Hansen ST Jr. Modified Lapidus procedure for hallux valgus. Foot Ankle 1989;9:262–6.
7. Morton DJ. The human foot. Columbia University Press; 1935.
8. Coughlin MJ, Jones CP. Hallux valgus: demographics, etiology, and radiographic assessment. Foot Ankle Int 2007;28:759–77.http://dx.doi.org/10.3113/FAI.2007.0759.
9. King DM, Toolan BC. Associated deformities and hypermobility in hallux valgus: an investigation with weightbearing radiographs. Foot Ankle Int 2004;25:251–5.
10. Coetzee JC, Resig SG, Kuskowski M, et al. The Lapidus procedure as salvage after failed surgical treatment of hallux valgus. Surgical technique. J Bone Joint Surg Am 2004;86A(Suppl 1):30–6.
11. Coetzee JC, Wickum D. The Lapidus procedure: a prospective cohort outcome study. Foot Ankle Int 2004;25:526–31.
12. Anderson M, Blais MM, Green WT. Lengths of the growing foot. J Bone Joint Surg Am 1956;38A:998–1000.
13. McInnes BD, Bouche RT. Critical evaluation of the modified Lapidus procedure. J Foot Ankle Surg 2001;40:71–90.
14. Catanzariti AR, Mendicino RW, Lee MS, et al. The modified Lapidus arthrodesis: a retrospective analysis. J Foot Ankle Surg 1999;38:322–32.
15. Glasoe WM, Allen MK, Ludewig PM. Comparison of first ray dorsal mobility among different forefoot alignments. J Orthop Sports Phys Ther 2000;30: 612–20 [discussion: 621–3].
16. Klaue K, Hansen ST, Masquelet AC. Clinical, quantitative assessment of first tarsometatarsal mobility in the sagittal plane and its relation to hallux valgus deformity. Foot Ankle Int 1994;15:9–13.
17. Beighton P, Solomon L, Soskolne CL. Articular mobility in an African population. Ann Rheum Dis 1973;32:413–8.
18. Grebing BR, Coughlin MJ. Evaluation of Morton's theory of second metatarsal hypertrophy. J Bone Joint Surg Am 2004;86A:1375–86.
19. Berntsen A. De l'hallux valgus: contribution a son etiologie et a son traitement. Rev Orthop 1930;3:101–11.
20. Ewald P. Die aetiologie des hallux valgus. Langenbecks Arch Surg 1912;114: 90–103.

21. Haines RW, McDougall A. The anatomy of hallux valgus. J Bone Joint Surg Br 1954;36B:272–93.
22. Mitchell CL, Fleming JL, Allen R, et al. Osteotomy-bunionectomy for hallux valgus. J Bone Joint Surg Am 1958;40A:41–58 [discussion: 59–60].
23. Myerson MS, Badekas A. Hypermobility of the first ray. Foot Ankle Clin 2000;5: 469–84.
24. Patel S, Ford LA, Etcheverry J, et al. Modified lapidus arthrodesis: rate of nonunion in 227 cases. J Foot Ankle Surg 2004;43:37–42.http://dx.doi.org/10.1053/j.jfas.2003.11.009.
25. Basile P, Cook EA, Cook JJ. Immediate weight bearing following modified lapidus arthrodesis. J Foot Ankle Surg 2010;49:459–64.http://dx.doi.org/10.1053/j.jfas.2010.06.003.
26. Blitz NM. Early weightbearing of the Lapidus bunionectomy: is it feasible? Clin Podiatr Med Surg 2012;29:367–81.http://dx.doi.org/10.1016/j.cpm.2012.04.009.
27. Cottom JM, Vora AM. Fixation of lapidus arthrodesis with a plantar interfragmentary screw and medial locking plate: a report of 88 cases. J Foot Ankle Surg 2013; 52:465–9.http://dx.doi.org/10.1053/j.jfas.2013.02.013.
28. Cohen DA, Parks BG, Schon LC. Screw fixation compared to H-locking plate fixation for first metatarsocuneiform arthrodesis: a biomechanical study. Foot Ankle Int 2005;26:984–9.
29. Egol KA, Kubiak EN, Fulkerson E, et al. Biomechanics of locked plates and screws. J Orthop Trauma 2004;18:488–93.
30. Johnson KA, Kile TA. Hallux valgus due to cuneiform-metatarsal instability. J South Orthop Assoc 1994;3:273–82.
31. Coetzee JC, Resig SG, Kuskowski M, et al. The Lapidus procedure as salvage after failed surgical treatment of hallux valgus: a prospective cohort study. J Bone Joint Surg Am 2003;85A:60–5.
32. Myerson M, Allon S, McGarvey W. Metatarsocuneiform arthrodesis for management of hallux valgus and metatarsus primus varus. Foot Ankle 1992;13: 107–15.
33. Thompson IM, Bohay DR, Anderson JG. Fusion rate of first tarsometatarsal arthrodesis in the modified Lapidus procedure and flatfoot reconstruction. Foot Ankle Int 2005;26:698–703.
34. Bednarz PA, Manoli A 2nd. Modified lapidus procedure for the treatment of hypermobile hallux valgus. Foot Ankle Int 2000;21:816–21.
35. Butson AR. A modification of the Lapidus operation for hallux valgus. J Bone Joint Surg Br 1980;62:350–2.
36. Myerson M. Metatarsocuneiform arthrodesis for treatment of hallux valgus and metatarsus primus varus. Orthopedics 1990;13:1025–31.
37. Fleming L, Savage TJ, Paden MH, et al. Results of modified lapidus arthrodesis procedure using medial eminence as an interpositional autograft. J Foot Ankle Surg 2011;50:272–5.http://dx.doi.org/10.1053/j.jfas.2011.02.012.
38. Grace D, Delmonte R, Catanzariti AR, et al. Modified lapidus arthrodesis for adolescent hallux abducto valgus. J Foot Ankle Surg 1999;38:8–13.
39. Kopp FJ, Patel MM, Levine DS, et al. The modified Lapidus procedure for hallux valgus: a clinical and radiographic analysis. Foot Ankle Int 2005;26:913–7.
40. Mauldin DM, Sanders M, Whitmer WW. Correction of hallux valgus with metatarsocuneiform stabilization. Foot Ankle 1990;11:59–66.
41. Rink-Brune O. Lapidus arthrodesis for management of hallux valgus–a retrospective review of 106 cases. J Foot Ankle Surg 2004;43:290–5.http://dx.doi.org/10.1053/j.jfas.2004.07.007.

42. Lapidus PW. The author's bunion operation from 1931 to 1959. Clin Orthop 1960; 16:119.
43. Goldner JL, Gaines RW. Adult and juvenile hallux valgus: analysis and treatment. Orthop Clin North Am 1976;7:863–87.
44. Lombardi CM, Silhanek AD, Connolly FG, et al. First metatarsocuneiform arthrodesis and Reverdin-Laird osteotomy for treatment of hallux valgus: an intermediate-term retrospective outcomes study. J Foot Ankle Surg 2003;42: 77–85.http://dx.doi.org/10.1053/jfas.2003.50014.

Exhibit 1026

Elsevier

March/April 2014
Volume 53, Number 2

The Journal of Foot & Ankle Surgery®

Proven leaders. Lifelong learners. Changing lives.

Official Publication of the
American College of Foot and Ankle Surgeons

The Journal of Foot & Ankle Surgery®

INFORMATION FOR SUBSCRIBERS

The Journal of Foot & Ankle Surgery® (ISSN 1067-2516) is published bimonthly by Elsevier Inc., 360 Park Avenue South, New York, NY 10010-1710. For Post Office use only: Volume 53, issue 2 of 6. Months of issue are January, March, May, July, September, and November. Periodicals postage paid at New York, NY and additional mailing offices.

POSTMASTER: Send address changes to *Journal of Foot & Ankle Surgery*, Elsevier Health Sciences Division, Subscription Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043.

Website: www.jfas.org

Editorial correspondence should be addressed to D. Scot Malay, DPM, MSCE, FACFAS, Editor, *The Journal of Foot & Ankle Surgery®*, 2314 Waverly Street, Philadelphia, PA 19146; telephone/fax: 215-967-4463; e-mail: editorjfas@gmail.com

Author inquiries: For inquiries relating to the submission of articles (including electronic submission where available) please visit www.elsevier.com/authors. This site also provides the facility to track accepted articles and set up e-mail alerts to inform you of when an article's status has changed, as well as detailed artwork guidelines, copyright information, frequently asked questions, and more. Contact details for questions arising after acceptance of an article, especially those relating to proofs, are provided after registration of an article for publication.

Information regarding ACFAS membership: Contact the American College of Foot and Ankle Surgeons (ACFAS), 8725 West Higgins Road, Suite 555, Chicago, IL 60631-2724. Phone: (773) 693-9300. Fax: (773) 693-9304.

Correspondence regarding subscriptions or change of address should be directed to *The Journal of Foot & Ankle Surgery®*, 3251 Riverport Lane, Maryland Heights, MO 63043. E-mail: elspcs@elsevier.com **ACFAS members, please contact the College with your change.**

Change of address notices, including both the old and new addresses of the subscriber and the mailing label, should be sent at least one month in advance.

Customer Service: Elsevier Health Sciences Division, Subscription Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. Tel: 1-800-654-2452 (U.S. and Canada); 314-447-8871 (outside U.S. and Canada). Fax: 314-447-8029. E-mail: journalscustomerservice-usa@elsevier.com (for print support); journalsonlinesupport-usa@elsevier.com (for online support).

Yearly subscription rates: *ACFAS members: Annual dues include* $35 *for* Journal *subscription. Nonmember rates:* United States and possessions: individuals, $199; students and residents, $99. All other countries: individuals, $281; students and residents, $139. For all areas outside the United States and possessions, there is no additional charge for surface delivery. To receive student/resident rate, orders must be accompanied by name of affiliated institution, date of term, and the *signature* of program/residency coordinator on institution letterhead. Orders will be billed at individual rate until proof of status is received.

Prices are subject to change without notice. Current prices are in effect for back volumes and back issues. Single issues, both current and back, exist in limited qualities and are offered for sale subject to availability. Back issues sold in conjunction with a subscription are on a prorated basis. Checks should be made payable to Elsevier and sent to *The Journal of Foot & Ankle Surgery®*, 3251 Riverport Lane, Maryland Heights, MO 63043.

Copyright © 2014 by the American College of Foot and Ankle Surgeons. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means now or hereafter known, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the Publisher. Printed in the United States of America.

Correspondence regarding permission to reprint all or part of any article published in this journal may be sought directly from Elsevier's Rights Department in Philadelphia, PA, USA; phone: (215) 239-3804, fax: (215) 239-3805. Requests may also be completed online via the Elsevier homepage (http://www.elsevier.com/authors/obtaining-permission-to-re-use-elsevier-material).

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients, for those registered with the Copyright Clearance Center, Inc. (222 Rosewood Drive, Danvers, MA 01923; (978) 750-8400; www.copyright.com). This consent is given on the condition that the copier pay the stated per-copy fee for that article through the Copyright Clearance Center, Inc. for copying beyond that permitted by Sections 107 or 108 of the US Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Absence of the code indicates that the material may not be processed through the Copyright Clearance Center, Inc.

Reprints of single articles available online may be obtained by purchasing Pay-Per-View access on the journal Website, www.jfas.org. For 100 or more copies of an article in this publication, please contact the Commercial Reprints Department, Elsevier Science Inc., 360 Park Avenue South, New York, NY 10010-1710. Telephone: (212) 633-3813, Fax: (212) 633-3820, e-mail: reprints@elsevier.com.

Advertising representative: Elsevier, 360 Park Ave South, New York, NY 10010. For Product Advertising Sales, and Recruitment & Classified Advertising Sales, contact: Danny Wang, Tel: 212-633-3158; Fax: 212-633-3820.

The ideas and opinions expressed in *The Journal of Foot & Ankle Surgery®* are those of the authors and do not necessarily reflect those of the American College of Foot and Ankle Surgeons, the Editor, or the Publisher. Publication of an advertisement or other product mention in *The Journal of Foot & Ankle Surgery®* should not be construed as an endorsement of the product or the manufacturer's claims. Readers are encouraged to contact the manufacturer with any questions about the features or limitations of the products mentioned. Neither the American College of Foot and Ankle Surgeons nor the Publisher assumes any responsibility for any injury and/or damage to persons or property arising out of or related to any use of the material contained in this periodical. The reader is advised to check the appropriate medical literature and the product information currently provided by the manufacturer of each device or of each drug to be administered to verify the dosage, the method and duration of administration, or contraindications. It is the responsibility of the treating physician or other health care professionals, relying on independent experience and knowledge of the patient, to determine drug dosages and the best treatment for the patient.

The contents of *The Journal of Foot & Ankle Surgery®* are currently included by the following services in print and/or electronic format: *Index Medicus, Excerpta Medica, Biosciences Information,* and *CINAHL.*

The Journal of Foot & Ankle Surgery®

VOLUME 53, NUMBER 2 MARCH/APRIL 2014

Contents

EDITORIAL

Reader (User) Beware 129
D. Scot Malay, DPM, MSCE, FACFAS

ORIGINAL RESEARCH

A Modified Fixation Technique for a Decompressional Shortening Osteotomy: A Retrospective Analysis 131
Jessica L. Herzog, DPM, AACFAS; W. David Goforth, DPM, AACFAS; Paul A. Stone, DPM, FACFAS; Matthew H. Paden, DPM, FACFAS

Diagnosis of Gas Gangrene: Does a Discrepancy Exist between the Published Data and Practice 137
Maryellen P. Brucato, DPM, AACFAS; Krupa Patel, DPM, AACFAS; Obinna Mgbako, DPM, AACFAS

Button Fixation Technique for Achilles Tendon Reinsertion: A Biomechanical Study 141
David Awogni, MD; Guillaume Chauvette, BEng; Marie-Line Lemieux; Frédéric Balg, MD, FRCSC; Ève Langelier, PhD; Jean-Pascal Allard, MD, FRCSC

Radiographic, Clinical, and Magnetic Resonance Imaging Analysis of Insertional Achilles Tendinopathy 147
Priya Ponnapula Sundararajan, DPM, AACFAS; Troy Scott Wilde, DPM

Could Failure of the Spring Ligament Complex Be the Driving Force behind the Development of the Adult Flatfoot Deformity? 152
Geraint Williams, MBChB; James Widnall, MBChB; Paul Evans, MBChB, FRCS; Simon Platt, MBChB, FRCS

Demographic Description of the Presentation and Treatment of Lower Extremity Skin and Soft Tissue Infections Secondary to Skin Popping in Intravenous Drug Abusers 156
Kelly Pirozzi, DPM; Jennifer C. Van, DPM; Jane Pontious, DPM; Andrew J. Meyr, DPM, FACFAS

Clarification of the Anatomic Definition of the Bunion Deformity 160
Paul Dayton, DPM, MS, FACFAS; Merrell Kauwe, BS; Mindi Feilmeier, DPM, FACFAS

A Comparative Study of Incorporation Rates between Non-xenograft and Bovine-based Structural Bone Graft in Foot and Ankle Surgery 164
Naohiro Shibuya, DPM, MS, FACFAS; Brandon K. Holloway, DPM; Daniel C. Jupiter, PhD

Demographic, Physical, and Radiographic Factors Associated with Functional Flatfoot Deformity 168
Naohiro Shibuya, DPM, MS, FACFAS; Ryan T. Kitterman, DPM; Javier LaFontaine, DPM, MS, FACFAS; Daniel C. Jupiter, PhD

Incidence of Surgical Site Infection in the Foot and Ankle with Early Exposure and Showering of Surgical Sites: A Prospective Observation 173
Mindi Feilmeier, DPM, FACFAS; Paul Dayton, DPM, MS, FACFAS; Shelly Sedberry, MS; Rachel A. Reimer, MPH, PhD

Popliteal Blocks for Foot and Ankle Surgery: Success Rate and Contributing Factors 176
Kenneth Hegewald, DPM; Kevin McCann, DPM; Andrew Elizaga, MD; Byron L. Hutchinson, DPM, FACFAS

REVIEW

Case Presentations and Review of Plexiform Schwannoma in the Foot 179
Samirah A. Mohammed, DPM, AACFAS; Martin M. Pressman, DPM, FACFAS; Brian Schmidt, DPM; Nina Babu, DPM, AACFAS

CASE REPORTS AND SERIES

Endoscopic Anterior Tarsal Tunnel Release: A Case Report 186
Tun Hing Lui, MD

Reconstruction of Compound Loss of Lateral Malleolus and Lateral Ankle Ligaments with Double-Bundle Achilles Tendon–Bone Allograft 189
Dukhwan Ko, MD; Hong-Geun Jung, MD; Hyeung-June Kim, MD; Seung-Han Cha, MD; Kyoung-Mo Nam, MD

Repair of Achilles Tendon Rupture Using Autologous Semitendinosus Graft in a Kidney Transplant Recipient 194
Ryohei Uchida, MD; Takashi Natsuume, MD, PhD; Kenji Yoneda, MD; Takeshi Fuji, MD, PhD

Dysplasia Epiphysealis Hemimelica with Involvement of the Distal Tibial Epiphysis and Talus: Recurrence of a Case and Literature Review 199
Zhengxiao Ouyang, MD; Min Xu, MD; Xianan Li, MD; Dan Peng, MD

Isolated Dislocation of the Posterior Tibial Tendon in an Amateur Snowboarder: A Case Report 203
Gabriel V. Gambardella, DPM; Ryan Donegan, DPM; David S. Caminear, DPM, FACFAS

Fibroma of Tendon Sheath Located within Kager's Triangle 208
Eva Jacobs, MD; Marianne A. Witlox, PhD, MD; Joris P.S. Hermus, MD

Osteoid Osteoma of the Cuboid Managed by Percutaneous Radiofrequency Ablation 212
Julian Chakraverty, FRCR; Namir Al-Mokhtar, FRCR; Steven L. James, FRCR

Primary Meningococcal Septic Arthritis of the Ankle Joint: A Case Report 216
Christopher Gee, MSc, MRCSEd; Tarang Tandon, MRCS; Adish Avasthi, MRCS; Susie Jerwood, MRCP, FRCPath; Biyyam M. Rao, FRCS (Tr and Orth); Simon Cavanagh, FRCS (Tr and Orth)

Merkel Cell Carcinoma: Case Study and Literature Review 219
Danae L. Lowell, DPM; Jerry Roberts, DPM; Prema Gogate, MD; Rose Goodwin, DPM

Bone Propeller Flap: A Staged Procedure 226
Mathias Tremp, MD; René D. Largo, MD; Olivier Borens, MD; Dirk J. Schaefer, MD; Daniel F. Kalbermatten, MD, PhD

Sports Injury to a Bipartite Medial Cuneiform in a Child 232
Timothy B. Eves, MRCS; Mudussar A. Ahmad, MRCS; Michael J. Oddy, MA, MSc, MB, FRCS (Tr & Orth)

Correction of a Severe Poliomyelitic Equinocavovarus Foot Using an Adjustable External Fixation Frame 235
Issei Nomura, MD; Koji Watanabe, MD, PhD; Hidenori Matsubara, MD, PhD; Hideji Nishida, MD, PhD; Toshiharu Shirai, MD, PhD; Hiroyuki Tsuchiya, MD, PhD

JFAS INSTRUCTIONAL COURSE

Primary Epithelioid Angiosarcoma of the Calcaneum: A Diagnostic Dilemma 239
Gopisankar Balaji G, MS Ortho, DNB Ortho; Justin S.V. Arockiaraj, MS Ortho, DNB Ortho; Alfred Cyril Roy, MS Ortho; Burad Deepak, MD Path

TIPS, QUIPS, AND PEARLS

Tarsometatarsal Joint Arthrodesis with Trephine Joint Resection and Dowel Calcaneal Bone Graft 243
Christopher J. Withey, BSc (Hons); Anthony L. Murphy, MRes, FCPodS; Rebecca Horner, BSc (Hons)

Correction of Frontal Plane Rotation of Sesamoid Apparatus during the Lapidus Procedure: A Novel Approach 248
Lawrence A. DiDomenico, DPM, FACFAS; Ramy Fahim, DPM, AACFAS; Jobeth Rollandini, DPM; Zachary M. Thomas, DPM

INVESTIGATORS' CORNER

Anything You Can Do I Can Do Better 252
Daniel C. Jupiter, PhD

Video file online only at http://www.jfas.org

The Journal of Foot & Ankle Surgery 53 (2014) 248–251

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

Correction of Frontal Plane Rotation of Sesamoid Apparatus during the Lapidus Procedure: A Novel Approach

Lawrence A. DiDomenico, DPM, FACFAS [1], Ramy Fahim, DPM, AACFAS [2], Jobeth Rollandini, DPM [3], Zachary M. Thomas, DPM [3]

[1] *Private Practice, Ankle and Foot Care Centers, Boardman, OH; Section Chief, Department of Podiatry, and Surgeon, Department of Surgery, St. Elizabeth Hospital Medical Center, Youngstown, OH*
[2] *Private Practice, Naples, FL*
[3] *Resident, Heritage Valley Health System, Beaver, PA*

ARTICLE INFO

Keywords:
bunion
first metatarsal
fluoroscopy
hallux abductovalgus
medial cuneiform
proximal phalanx
sesamoids

ABSTRACT

The Lapidus procedure affords correction of a multitude of first ray pathologic entities. When reconstructing the first ray using the Lapidus procedure, the relocation of the first metatarsal over the sesamoid bones with frontal plane rotation should be considered one of the key components. In the present technical report, we have described a bunion correction with emphasis on sesamoid reduction through indirect frontal plane manipulation. Our technique, borne from applied basic anatomy of the first metatarsophalangeal joint, uses intact soft tissues about the first metatarsophalangeal joint to reduce subluxed or dislocated sesamoids.

© 2014 by the American College of Foot and Ankle Surgeons. All rights reserved.

Many factors contribute to the maintenance of hallux abducto valgus (HAV) correction. Adequate alignment, soft tissue balancing, an atraumatic technique, appropriate fixation techniques, and postoperative protocols all play a role in a successful outcome. We describe a bunion correction with emphasis on sesamoid reduction through indirect frontal plane manipulation (Figs. 1 and 2). Our technique, borne from applied basic anatomy of the first metatarsophalangeal joint (MTPJ), uses these intact soft tissues to reduce subluxed or dislocated sesamoids.

The sesamoid apparatus of the first MTPJ consists of the 2 sesamoids encased in a thick plantar plate and connected by an interosseous ligament. The sesamoids are connected to the first metatarsal head by a medial and lateral metatarsosesamoid ligament and suspensory ligaments and are connected to the first proximal phalanx by medial and lateral sesamophalangeal ligaments. The sesamoid apparatus is also enveloped on a nonarticular plantar surface by the flexor hallucis brevis, transverse and oblique segments of the adductor hallucis, the deep transverse metatarsal ligament, and fibers of the plantar aponeurosis. The tibial and fibular sesamoids are true synovial joints with hyaline cartilage interfaces (1,2). Our surgical rational was anatomically based. Frontal plane rotation of the first metatarsal head by manual reduction and ligamentotaxis provided by manipulation of the first proximal phalanx during the modified Lapidus arthrodesis can reliably reduce the sesamoids under the first metatarsal head, leaving the soft tissues intact. This differs from the translational approach, which relies on resection of the lateral soft tissue structures to translate into the transverse plane. Additionally, the standard techniques using typical anteroposterior radiographs provide static views of the deformity and do not foster consideration of the dynamic effects of the soft tissue around the osseous structures.

Surgical Technique

A 4- to 6-cm incision is made over the metatarsal cuneiform joint, and the tarsometatarsal ligaments are resected to expose and prepare the joint. The first tarsal metatarsal joint is destabilized, distracted, and prepared using a combination of a power saw, osteotome, mallet, drills, and picks to ensure good subchondral bone exposure. In contrast to the procedures of the past, dissection of the MTPJ is eliminated, just as is the resection of the medial eminence and the lateral release (Supplemental Video S1).

The reduction maneuver is performed by grasping the hallux and derotating the hallux out of the valgus in a varus direction, which places the nail plate in a neutral position, parallel with the ground. The surgeon then dorsiflexes the first digit while maintaining frontal plane alignment, enabling correction of the sagittal plane. The first metatarsal is put into adduction, and the surgeon's thumb is used to put counterpressure on the first metatarsal head, thus correcting the transverse plane. This allows for the entire hallux, sesamoid, and first

Financial Disclosure: None reported.
Conflict of Interest: None reported.
Address correspondence to: Lawrence A. DiDomenico, DPM, FACFAS, Ankle and Foot Care Centers, 8175 Market Street, Boardman, OH 44512.
E-mail address: ld5353@aol.com (L.A. DiDomenico).
Video online only at http://www.jfas.org

1067-2516/$ - see front matter © 2014 by the American College of Foot and Ankle Surgeons. All rights reserved.
http://dx.doi.org/10.1053/j.jfas.2013.12.002

This material may be protected by Copyright law (Title 17 U.S. Code)



Fig. 1. Preoperative radiograph.



Fig. 3. Intraoperative view after destabilization of the first tarsometatarsal joint and reduction of valgus rotation of the first metatarsophalangeal joint, with the sesamoids rotated into rectus alignment in the frontal plane.

metatarsal complex to be rotated into a neutral position as 1 unit. The sesamoid correction can be observed under fluoroscopy (Figs. 3 and 4). The first tarsal metatarsal joint is pinned with a 2.0 Kirschner wire from dorsally and distally to plantarally and proximally.

If additional frontal plane rotation is needed, the Kirschner wire is backed out. An additional Kirschner wire is placed in the proximal metaphysis of the first metatarsal, perpendicular to the weightbearing surface, and used as a "joy stick." The original Kirschner wire is then reintroduced for temporary stabilization from the distal first metatarsal into the cuneiform. A third Kirschner wire is introduced as a second point of fixation from the first metatarsal head into the second while applying abductory pressure to the first



Fig. 2. Preoperative radiograph.



Fig. 4. Intraoperative view after destabilization of the first tarsometatarsal joint and reduction of valgus rotation of the first metatarsophalangeal joint, with the sesamoids rotated into rectus alignment in the frontal plane.



Fig. 5. Postoperative views of the great toe derotated to a neutral position, with complete reduction of the hallux valgus angle and well-aligned sesamoids and metatarsophalangeal joint complex.



Fig. 6. Postoperative views of the great toe derotated to a neutral position, with complete reduction of the hallux valgus angle and well-aligned sesamoids and metatarsophalangeal joint complex.

metatarsal head. Kirschner wires are used to maintain the correction obtained by these additional maneuvers. Definitive fixation is achieved with a 3.5-mm cortical screw introduced with a lag technique in a "home-run" fashion, as described by Hansen (3). The screw should be as long as possible from anteriorly to posteriorly and should engage the posterior cortex of the medial cuneiform. Finally, a 6-hole combination locking/nonlocking plate is placed to function as a "large washer" in reducing the intermetatarsal angle with the lag screws and maintaining the correction with the locking screws (Figs. 5 and 6).

Discussion

The frontal plane component of HAV correction has recently received some attention. Dayton et al (4) recently stated that frontal plane malalignment is a key component of the HAV deformity and concluded that it must be addressed during correction to provide anatomic alignment of the first MTPJ. We agree with their statements and offer our technique for reliable reduction of an abnormal sesamoid position in HAV. The HAV deformity is essentially a subluxed joint that is malaligned because of instability and hypermobility. Rather than relying on soft tissue releases and capsular repairs, our technique has been based on the mechanics of ligamentotaxis and precise realignment of the bony segments. Resection of the first tarsometatarsal joint enhances the ability to manipulate the first ray into the anatomic position, and stabilization is accomplished. Once the first metatarsal has been derotated and stress is off the soft tissues, the frontal plane will return to the natural anatomic alignment, and the position can be held by fusing the first tarsometatarsal joint.

The normal sesamoid position is a principle factor contributing to normal gait. The results of a 3-dimensional kinematic analysis in a cadaver model demonstrated that the sesamoid apparatus plays a significant role in the biomechanical function of the first ray and that less than optimal realignment of the apparatus can lead to adverse retrograde forces, with the increased possibility of recurrence (5). Thus, the intraoperative sesamoid position should be evaluated during bunionectomy, regardless of the procedure selected, using either fluoroscopy or direct visualization.

The sesamoids are housed within an intricate network of ligaments, tendons, and capsular structures, all of which function as a



Fig. 7. Clinical photograph of the well-healed foot showing the isolated incision of the tarsometatarsal area.

unit about the first MTPJ (1,6). The traditional methods of sesamoid reduction have involved detaching the restraining structures of the first MTPJ. Various methods have included modifications of McBride's soft tissue release and capsular augmentations, which rely on scar tissue formation to reduce bony deformities (7). Although this has historically been proved to reduce the first metatarsal head under the sesamoid apparatus (8), this technique relies solely on transverse plane motion. Inherently, this will not be an adequate reduction maneuver to reduce the first ray in all 3 planes. Our technique of using the soft tissue-retaining structures of the first MTPJ will also alleviate several postoperative concerns. No scar tissue will be formed along the joint (Fig. 7). The gliding mechanism of the tendon structures about the MTPJ will be maintained. Also, there is no risk of staking the first metatarsal head, and hallux varus is less of a concern, because all the retaining structures about the first MTPJ are intact. Finally, no vascular or nerve concerns exist pertaining to the nutrient artery to the lateral first metatarsal head.

Conclusion

The present report details a technique for using the restraining structures of the first MTPJ rather than severing them. We have seen clinical evidence that the technique we have described is a viable option for correction. From our initial findings, this technique allows the soft tissue to be maintained, affording the patient a less-invasive procedure, with a lower risk of complications. An outcomes study is currently underway to further validate the effectiveness of our technique.

Supplementary Material

Supplementary material associated with this article can be found in the online version at www.jfas.org (doi:10.1053/j.jfas.2013.12.002).

References

1. Sarrafian SK, Kelikian AS. Osteology. In: *Sarrafian's Anatomy of the Foot and Ankle*, ed 3, edited by AS Kelikian, Lippincott Williams and Wilkins, Philadelphia, 2011.
2. Breslauer C, Cohen M. Effect of proximal articular set angle-correcting osteotomies on the hallucal sesamoid apparatus: a cadaveric and radiographic investigation. J Foot Ankle Surg 40:366–373, 2001.
3. Hansen ST Jr. First tarsometatarsal joint arthrodesis. In: *Functional Reconstruction of the Foot and Ankle*, pp. 335–340, edited by ST Hansen, Lippincott Williams & Wilkins, Philadelphia, 2000.
4. Dayton P, Feilmeier M, Kauwe M, Hirschi J. Relationship of frontal plane rotation of first metatarsal to proximal articular set angle and hallux alignment in patients undergoing tarsometatarsal arthrodesis for hallux abducto valgus: a case series and critical review of the literature. J Foot Ankle Surg 52:348–354, 2013.
5. Rush SM, Christensen JC, Johnson CH. Biomechanics of the first ray. Part II: metatarsus primus varus as a cause of hypermobility. A three-dimensional kinematic analysis in a cadaver model. J Foot Ankle Surg 39:68–77, 2000.
6. Gerber M, Roberto PD. Sesamoids. In: *Hallux Valgus and Forefoot Surgery*, pp. 153–162, edited by VJ Hetherington, OCPM, Cleveland, 2000.
7. Mcbride ED. A conservative option for bunions. J Bone Joint Surg 10:735–739, 1928.
8. Judge MS, LaPointe S, Yu GV, Shook JE, Taylor RP. The effect of hallux abducto valgus surgery on the sesamoid apparatus position. J Am Podiatr Med Assoc 89:551–559, 1999.



Attachment 1A

Bibliographic Record - OCLC Number: 27182191

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	27182191	
005	20251105200619.6	
008	Date Entered on File	'921230'
	Type of Date/Publication Status	'c' - Continuing resource currently published
	Date1/Beginning Date of Publication	'1993'
	Date2/Ending Date of Publication	'9999'
	Place of Publication, Production, or Execution Code	'mdu' - Maryland
	Frequency	'b' - Bimonthly
	Regularity	'r' - Regular
	Type of Continuing Resource	'p' - Periodical
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	'c' - Cooperative cataloging program

010 sn 92006834

040 NSD **$b** eng **$c** NSD **$d** CAS **$d** NST **$d** WAU **$d** EYM **$d** NLM **$d** HUL **$d** SYS **$d** OCLCQ **$d** PIT **$d** NSD **$d** OCLCQ **$d** CLU **$d** ITD **$d** OCLCQ **$d** AU@ **$d** UKMGB **$d** OCLCQ **$d** OCLCO **$d** OCLCQ **$d** OCLCF **$d** OCLCO **$d** OCLCA **$d** DLC **$d** OCLCA **$d** OCLCQ **$d** O CLCL **$d** OCLCQ

012 **$i** 9304 **$j** 0 **$k** 1 **$l** 1 **$m** 1

016 7 9308427 **$2** DNLM

016 7 SR0076946 **$2** DNLM

016 7 012433868 **$2** Uk

016 7 012116839 **$2** Uk

019 221526201 **$a** 995484954 **$a** 1053978593 **$a** 1063456326 **$a** 1089787521

022 0 1067-2516 **$2** j

023 0 1067-2516 **$2** j

030 JFSUEI

032 922540 **$b** USPS

037 **$b** Williams & Wilkins, 428 E. Preston St., Baltimore, MD 21202

042 nsdp **$a** pcc
050 4 RD560
060 0 0 W1 **$b** JO652S
082 1 0 617 **$2** 12 **$1** https://id.oclc.org/worldcat/ddc/E3YM8MMTVgYPgDmxF4cHh8XGcP
210 0 J. foot ankle surg.
222 4 The Journal of foot and ankle surgery
245 0 4 The Journal of foot and ankle surgery.
260 Baltimore, MD : **$b** Williams & Wilkins, **$c** ©1993-
300 volumes : **$b** illustrations ; **$c** 28 cm
310 Bimonthly
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 0 Vol. 32, no. 1 (Jan./Feb. 1993)-
500 Title from cover.
500 Published: Baltimore, MD : Data Trace Pub., <1998->
530 Also issued in online version.
550 "Official journal of the American College of Foot and Ankle Surgeons."
650 0 Ankle **$x** Surgery **$v** Periodicals.
650 0 Foot **$x** Surgery **$v** Periodicals.
650 2 Ankle **$x** surgery.
650 2 Foot **$x** surgery.
650 7 Ankle **$x** Surgery. **$2** fast **$0** (OCoLC)fst00809686
650 7 Foot **$x** Surgery. **$2** fast **$0** (OCoLC)fst00931326
655 2 Periodical.
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
710 2 American College of Foot and Ankle Surgeons. **$1** https://id.oclc.org/worldcat/entity/E39QH7JmqhfHftRmw3VbPc3FhR
776 1 **$t** Journal of foot and ankle surgery (Online) **$x** 1542-2224 **$w** (DLC) 2002213269 **$w** (OCoLC)50849610
780 0 0 **$t** Journal of foot surgery **$x** 0449-2544 **$w** (DLC)sn 79006255 **$w** (OCoLC)3711674
850 DNLM **$a** MiU **$a** MoSW-M **$a** WaU
856 4 1 **$u** http://www.sciencedirect.com/science/journal/10672516
856 4 1 **$u** http://www.jfas.org
891 3 3 **$9** 853 **$8** 1 **$a** v. **$b** no. **$u** 06 **$v** r **$i** (year) **$j** (month/month) **$w** b **$x** 01
891 4 0 **$9** 863 **$8** 1 **$a** <33> **$i** <1994> **$x** provisional
029 1 AU@ **$b** 000009838820
029 1 AU@ **$b** 000023036808
029 1 AU@ **$b** 000053142085
029 1 NLGGC **$b** 106063979
029 1 NLM **$b** 9308427
029 1 NZ1 **$b** 3847676
029 1 ZWZ **$b** 04030227X
029 1 UKMGB **$b** 012116839

Attachment 1B

MARC record

LC control no.:	sh 85005320
LCCN Permalink:	https://lccn.loc.gov/sh85005320 (link opens in a new tab)
000	00389cz a2200145n 4500
001	sh 85005320
005	20250804132630.8
003	DLC
008	860211i| anannbabn |n ana
010	$a sh 85005320
035	$a (DLC)sh 85005320
035	$a (DLC)5096
040	$a DLC $c DLC $d DLC
150	$a Ankle $x Surgery
999 f f	$i d9e405cd-f220-45b4-bff1-73194001d82c $s 3b26e4c2-72a9-47f5-b2c1-07841c35bd26

Attachment 1C

MARC record

LC control no.:	sh 85099890
LCCN Permalink:	https://lccn.loc.gov/sh85099890 (link opens in a new tab)
000	01290cz a2200313n 4500
001	sh 85099890
005	20250804134933.4
003	DLC
008	040419 | anannbabn |b ana
010	$a sh 85099890
035	$a (DLC)sh 85099890
035	$a (DLC)6226910
035	$a (DLC)sp 85099890
035	$a (DLC)314952
040	$a DLC $c DLC $d DLC
053 0	$a AP $c General periodicals
053 0	$a PN4700 $b PN5650 $c History
150	$a Periodicals
360	$i subdivision $a Periodicals $i under specific subjects, e.g. $a Engineering--Periodicals; United States--History--Periodicals
450	$a Journals (Periodicals)
450	$a Magazines
550	$w g $a Library materials
550	$w g $a Mass media
550	$w g $a Serial publications
550	$a Newspapers
550	$a Press
670	$a UMI business vocab. $b (Journals)
680	$i Here are entered works on the periodicals of the world and, with appropriate subdivisions, works on special aspects or sections of periodicals. Works on periodicals in a specific language, or in a specific country or larger area, are entered under the adjectival form of the language or area, e.g. $a Arabic periodicals; Canadian periodicals.
999 f f	$i f3c2f118-a0af-4986-bcda-385995e5c57d $s 6e61730c-f0c8-4352-b06f-cb3fc2acd8a0

Attachment 1D

MARC record

LC control no.:	sh 85050391
LCCN Permalink:	https://lccn.loc.gov/sh85050391 (link opens in a new tab)
000	00484nz a2200181n 4500
001	sh 85050391
005	20250804133017.6
003	DLC
008	860211i| anannbabn |b ana
010	$a sh 85050391
035	$a (DLC)sh 85050391
035	$a (DLC)48739
040	$a DLC $c DLC
053 0	$a RD563
150	$a Foot $x Surgery
550	$w g $a Podiatry
681	$i Example under $a Surgery, Operative
999 f f	$i 17babdb9-0be6-4739-9e39-344da1729c01 $s 52eb5cd7-8442-410b-8d9a-56a2eec886d1

Attachment 1E

Ankle MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Ankle
Tree Number(s)
A01.378.610.050
Unique ID
D000842
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D000842
Annotation
primates only; use TARSUS, ANIMAL for non-primate vertebrates; differentiate from ANKLE JOINT; ANKLE BONES see TARSAL BONES is also available; do not confuse X ref TARSUS with tarsus or tarsal referring to the eyelid
Scope Note
The region of the lower limb between the FOOT and the LEG.
Entry Term(s)
Regio tarsalis
Tarsus
See Also
Ankle Joint
Tarsal Bones
Public MeSH Note
1963; see ANKLE INJURIES to search ANKLE/injuries 1966-91; for TARSUS see TARSUS 1988-2001
History Note
1963; use ANKLE INJURIES to search ANKLE/injuries 1966-91
Entry Combination
injuries:Ankle Injuries
Date Established
1963/01/01
Date of Entry
1999/01/01
Revision Date
2019/07/01

page delivered in 0.166s

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 1F

Foot MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Foot
Tree Number(s)
A01.378.610.250
Unique ID
D005528
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D005528
Annotation
vertebrates only: for invertebrates use EXTREMITIES: dis of foot = FOOT DISEASES; skin dis on foot = FOOT DERMATOSES: see note there; neopl of foot: use neopl coords (IM) + FOOT DISEASES (IM); foot prints (like finger prints) = PLANTAR PRINTS see DERMATOGLYPHICS
Scope Note
The distal extremity of the leg in vertebrates, consisting of the tarsus (ANKLE); METATARSUS; phalanges; and the soft tissues surrounding these bones.
Entry Term(s)
Feet
See Also
Foot Bones
Entry Combination
abnormalities:Foot Deformities, Congenital
injuries:Foot Injuries
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2009/07/31

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 2A

LDR	01431pam a2200433 a 4500
001	9915783213406676
005	20211204001949.0
008	120215s2013 paua b 001 0 eng
010	__ | **a** 2012006861
020	__ | **a**9780781765800
020	__ | **a**0781765803
035	__ | **9**101578321
040	__ | **a**DNLM**c**DNLM
041	0_ | **a**eng
042	__ | **a**pcc
044	__ | **9**United States
060	00 | **a**WE 880**b**M478 2013
245	00 | **a**McGlamry's comprehensive textbook of foot and ankle surgery.
246	1_ | **a**Comprehensive textbook of foot and ankle surgery
250	__ | **a**4th ed. /**b**editor, Joe T. Southerland ; author editor, Daniel F. Vickers ; section editors, Jeffrey S. Boberg ... [et al.].
260	__ | **a**Philadelphia :**b**Wolters Kluwer Health/Lippincott Williams & Wilkins,**c**c2013.
300	__ | **a**2 v. (xix, 1928, I-54 p.) :**b**ill.
336	__ | **a**text**b**txt**2**rdacontent
337	__ | **a**unmediated**b**n**2**rdamedia
338	__ | **a**volume**b**nc**2**rdacarrier
504	__ | **a**Includes bibliographical references and index.
650	12 | **a**Foot**x**surgery
650	22 | **a**Ankle**x**surgery
650	22 | **a**Foot Deformities**x**surgery
650	22 | **a**Foot Injuries**x**surgery
700	1_ | **a**McGlamry, E. Dalton.
700	1_ | **a**Southerland, Joe T.
935	__ | **a**(DNLM)1578321-nlmdb
992	__ | **p**P1**e**EF**a**20130228
993	__ | **a**VLD**b**20130312
994	__ | **a**CDN**b**20130312
995	__ | **a**AUTH**b**20120216**c**REV**d**20180131
996	__ | **a**rev. CIP**b**20130312
999	__ | **a**AUTH

Attachment 2B

Bibliographic Record - OCLC Number: 777364374

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	'm' - Monograph/Item
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	777364374	
005	20250807183805.1	
008	Date Entered on File	'120215'
	Type of Date/Publication Status	's' - Single date
	Date1/Beginning Date of Publication	'2013'
	Date2/Ending Date of Publication	' '
	Place of Publication, Production, or Execution Code	'pau' - Pennsylvania
	Illustrations	'a '
	Target Audience	' ' - Unknown or unspecified
	Form of Item	' ' - None of the following
	Nature of Contents Code	'b '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Festschrift	'0' - Not a festschrift
	Index	'1' - Index present
	Literary Form	'0' - Not fiction
	Biography	' ' - No biographical material
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	' ' - National bibliographic agency

010 2012006861

040 DNLM/DLC **$b** eng **$c** DLC **$d** YDX **$d** NLM **$d** BTCTA **$d** KSU **$d** OCLCO **$d** YDXCP **$d** CDX **$d** OCLCF **$d** WUM **$d** OCLCQ **$d** S3O **$d** OCLCQ **$d** MYUKM **$d** Z5A **$d** CCO **$d** OCLCO **$d** OCLCA **$d** CASCU **$d** OCLCQ **$d** OCLCO **$d** UV0 **$d** IG# **$d** OCLCL

016 7 101578321 **$2** DNLM

019 781683444 **$a** 958646542 **$a** 988814996

020 9780781765800 **$q** (set)

020 0781765803 **$q** (set)

042 pcc

050 1 0 RD563 **$b** .C657 2013

060 0 0 2013 F-785

060 1 0 WE 880 **$b** M478 2013

082 0 0 617.5/85059 **$2** 23 **$1** https://id.oclc.org/worldcat/ddc/E3wxPfTgh4KbhWyym3r4kCCHcC

245 0 0 McGlamry's comprehensive textbook of foot and ankle surgery.

246 3 0 Comprehensive textbook of foot and ankle surgery

250 4th ed. / **$b** editor, Joe T. Southerland ; section editors, Jeffrey S. Boberg [and others].

260 Philadelphia : **$b** Wolters Kluwer Health/Lippincott Williams & Wilkins, **$c** ©2013.

300 2 volumes (xix, 1928, I-54 pages) : **$b** illustrations (some color) ; **$c** 29 cm

336 text **$b** txt **$2** rdacontent

337 unmediated **$b** n **$2** rdamedia

338 volume **$b** nc **$2** rdacarrier

504 Includes bibliographical references and index.

520 From perioperative management to postoperative complications and considerations, this resource prep ares you for a full range of podiatric surgeries and procedures ranging from routine trauma of the foot and leg to compound deformities, enabling you to face any challenge with confidence. NEW to the Fo urth Edition: Full color format highlights key anatomic structures and surgical approaches. Enhanced detail helps you perform complex surgical procedures with confidence. Chapter on ankle implants cov ers recent advances and helps you improve patient outcomes. Whether you're a resident or a seasoned practitioner seeking specific guidance on new or emerging techniques.

505 0 Machine generated contents note: pt. I BASICS -- Section I Technical Principles -- 1.Instrumentation / Robyn Winner -- 2.Biomaterials: Metals and Other Nonabsorbables / Jeffrey C. Christensen -- 3.Absor bable Biomaterials / Adam S. Landsman -- 4.Suture Materials and Needles / Danny R. Fijalfowski -- S ection II Perioperative Management -- 5.Perioperative Evaluation / Andrea D. Cass -- 6.Local Anesthe tics / Donald R. Green -- 7.General and Regional Anesthesia / Donald R. Powell -- 8.Perioperative Pai n Management / John S. Steinberg -- 9.Perioperative Prophylaxis for Deep Vein Thrombosis / James H. Morgan, Jr. -- 10.Perioperative Antibiotics / Amanda Meszaros -- pt. II FOREFOOT SURGERY -- Section I Nail Surgery -- 11.Nail Surgery / Jeffrey S. Boberg -- Section II Morton Neuroma -- 12.Inter digital Neuroma (Morton Neuroma) / Cameron L. Eilts -- Section III Digital Deformity -- 13.Lesser Di gital Deformities: Etiology, Procedural Selection, and Arthroplasty / Jason J. Willis -- 14.Digital Surge ry: Metatarsophalangeal Joint Release and Proximal Interphalangeal Joint Arthrodesis / John A. Ruch - - 15.Flail Toe with Bone Graft / Kieran T. Mahan -- 16.Flexor Digitorum Longus Tendon Transfer / St even A. Weiskopf -- 17.Congenital Overlapping Fifth Toe Deformity / Jon M. Wilson, Jr. -- 18.Surgica l Repair of Fifth Digit Deformities / Keith D. Pfeifer -- Section IV Lesser Metatarsophalangeal Joint D eformities -- 19.Plantar Plate Repair of the Second Metatarsophalangeal Joint / Craig A. Camasta -- 2 0.Transverse Plane Digital Deformities / Sarah A. Spizzirri -- 21.The Weil Lesser Metatarsal Osteotom y / Richard J. Zirm -- 22.Central Rays: V Osteotomy, DFWO, Condylectomy / Jeffrey S. Boberg -- 23. Tailor's Bunion Deformity / Jane Pontious -- pt. III FIRST RAY, HALLUX ABDUCIO VALGUS, AN D RELATED DEFORMITIES -- 24.Evaluation and Procedural Selection in Hallux Valgus Surgery / J effrey S. Boberg -- 25.Anatomic Dissection of the First Metatarsophalangeal Joint for Hallux Valgus S urgery / Claire A. Hollstrom -- 26.Hallux Osteotomies / Jared L. Moon -- 27.Distal Metaphyseal Osteo tomies in Hallux Abducto Valgus Surgery / Patrick B. Hall -- 28.Proximal Osteotomies of the First Me tatarsal / Robb A. Mothershed -- 29.Offset-V Osteotomy of the First Metatarsal Shaft in Hallux Abduc to Valgus / Harold W. Vogler -- 30.Z-Scarf Osteotomy / Charles J. Gudas -- 31.Lapidus Bunionectom y: First Metatarsal -- Cuneiform Arthrodesis / Mari Wargo-Dorsey -- 32.Juvenile Hallux Abducto Valg us Deformity / Tracy L. Klimaz -- 33.Joint Salvage and Preservation Surgical Techniques for Hallux L imitus / Craig A. Camasta -- 34.First Metatarsophalangeal Joint Arthroplasty / Jonnica S. Dozier -- 35. First Metatarsophalangeal Joint Arthrodesis / Allison J.A. Menke -- 36.Complications in Hallux Abduc to Valgus Surgery (Excluding Hallux Varus) / Molly A. Judge -- 37.Hallux Varus / Molly A. Judge -- p t. IV REAR FOOT -- Section I Midfoot and Heel Surgery -- 38.Common Pedal Prominences / Leslie B. Dowling -- 39.Plantar Heel / William Harris IV -- 40.The Distal Tarsal Tunnel: First Branch of the Lateral Plantar Nerve Release / Robert M. Goecker -- 41.Plantar Foot Surgery / Suhail B. Masadeh -- 42.Pes Cavus Surgery / Andrea D. Cass -- Section II Valgus Foot Deformity -- 43.Ankle Equinus / Jacl yn M. Schwartz -- 44.Flexible Valgus Deformity / K. Paul Flanigan -- 45.Tarsal Coalition / Alison M. DeWaters -- 46.Posterior Tibial Tendon Dysfunction / Michael P. Maskill -- 47.Medial Column Fusion / Thomas J. Chang -- 48.Arthroereisis / Mitzi L. Williams -- pt. V ANKLE -- 49.Os Trigonum Surgery / Molly A. Judge -- 50.Acute Ankle Conditions / Gina A. Hild -- 51.Old Syndesmotic Injuries / Travis A. Motley -- 52.Ankle Replacement Arthroplasty / Jeffrey C. Christensen -- 53.Arthroscopy of the An kle and Foot / John J. Stienstra -- 54.Osteochondroses of the Foot and Ankle / Jacob A. Hord -- pt. VI MIDFOOT JOINT ARTHRODESIS -- 55.Principles of Arthrodesis / John A. Ruch -- 56.Tarsometatars al Arthrodesis / Robert W. Mendicino -- 57.Trephine Arthrodesis at the Midfoot / Annette D. Filiatrault

-- 58.Triple Arthrodesis / Patrick B. Hall -- 59.Subtalar Joint Arthrodesis / Mark A. Hardy -- 60.Talonavicular Fusions / William D. Fishco -- 61.Pantalar Arthrodesis / Brian B. Carpenter -- pt. VII SPECIAL SURGERY: CONDITIONS -- Section I Rheumatoid Foot and Ankle -- 62.Rheumatoid Rearfoot / Daniel J. Yarmel -- 63.Pan Metatarsal Head Resection / Dennis E. Martin -- Section II Neurologic Disorders -- 64.Spasticity and Paralytic Disorders / R. David Warren -- 65.Charcot-Marie-Tooth Disease / Richard J. Zirm -- Section III Peripheral Nerve Surgery -- 66.General Entrapment Syndromes / Marija Ugrinich -- 67.Tarsal Tunnel Syndrome / Daniel J. Yarmel -- 68.Complex Regional Pain Syndromes and Related Disorders / Jeffrey C. Christensen -- Section IV Diabetic Foot -- 69.Evaluation and Management of the Diabetic Foot Wound / Paul J. Kim -- 70.Charcot Foot and Ankle Deformity / Thomas S. Roukis -- 71.Amputations / Linnie V. Rabjohn -- Section V Congenital Deformities -- 72.Brachymetatarsia / Dennis E. Martin -- 73.Metatarsus Adductus and Allied Disorders / Patrick S. Agnew -- 74.Clubfoot / Jorge G. Penagos Vasquez -- 75.Congenital Digital Deformities -- 75.1.Polydactyly / Annette D. Filiatrault -- 75.2.Macrodactyly / Thomas A. Brosky II -- 75.3.Ectrodactyly / Cornelius M. Donohue -- 75.4.Syndactyly / Tara L. Giorgini -- pt. VIII SPECIAL SURGERY: SOFT TISSUE -- 76.Principles of Muscle -- Tendon Surgery and Tendon Transfers / Mack Jay Groves IV -- 77.Peroneal Tendon Disorders / Michelle C. Anania -- 78.Achilles Tendon Disorders / James L. Thomas -- 79.Plastic and Reconstructive Surgery / Michael S. Lee -- 80.Bone Anchors / Mitzi L. Williams -- 81.Interpositional Arthroplasty of the First Metatarsophalangeal Joint / Jaymes D. Granata -- 82.Lateral Column Arthroplasty / Thomas J. Chang -- pt. IX SPECIAL SURGERY: MISCELLEANEOUS TOPICS -- 83.External Fixation of Rearfoot and Ankle Arthrodeses / Bradley M. Iamm -- 84.Puncture Wounds / Michelle L. Butterworth -- 85.Lower Extremity Infections / Warren S. Joseph -- 86.Osteomyelitis / Geoffrey S. Heard -- 87.Nonunions / Stephan J. LaPointe -- 88.Orthobiologics / William Harris IV -- 89.Electrical and Mechanical Bone Growth Stimulation / Wen-Yin Choi Wang -- 90.Nonosseous Injuries / Keith D. Cook -- pt. X TUMORS -- 91.Skin Lesions / Marija Ugrinich -- 92.Soft Tissue Masses / Christa M. Gredlein -- 93.Bone Tumors of the Foot and Ankle / Hilaree B. Milliron -- 94.Surgical Management of Bone Tumors in the Foot and Ankle / B. Hudson Berrey -- 95.Plantar Fibromatosis / Randall J. Contento -- pt. XI TRAUMA -- Section I Acute Trauma -- 96.Open Fractures / Jordan P. Grossman -- 97.Complex Soft Tissue Injuries: Degloving and Soft Tissue Loss Injuries / John S. Steinberg -- 98.Complications of Internal Fixation / William G. Montross -- 99.Trauma to the Nail and Associated Structures / Robyn Winner -- 100.Management of Acute and Chronic Tendon Injury / Ryan H. Fitzgerald -- 101.Achilles Tendon Trauma / Keith L. Jacobson -- 102.Dislocations of the Foot and Ankle / Johanna-Marie Richey -- 103.Digital and Sesamoid Fractures / Gretchen A. Lawrence -- 104.Metatarsal Fractures / Linda Ho -- 105.Midfoot Fractures / Brian B. Carpenter -- 106.Tarsometatarsal (Lisfranc) Joint Dislocation / Dawn Y. Stein -- 107.Calcaneal Fractures / John M. Schuberth -- 108.Talar Fractures / Meagan M. Jennings -- 109.Ankle Fractures / Kittra T. Owens -- 110.Pilon Fractures / Justin J. Fleming -- 111.Pediatric Foot and Ankle Fractures / Edwin J. Harris -- Section II Repair of Posttraumatic Injuries -- 112.Neglected Calcaneal Fractures / George T. Liu -- 113.Ankle Malunions / John E. Herzenberg -- 114.Supramalleolar Osteotomy / John M. Schuberth -- 115.Talar Avascular Necrosis / William T. DeCarbo -- 116.Lisfranc Injuries / George F. Wallace -- 117.Fibular Lengthening / Byron L. Hutchinson.

650 0 Foot **$x** Surgery.

650 0 Ankle **$x** Surgery.

650 0 Foot **$x** Wounds and injuries **$x** Surgery.

650 0 Ankle **$x** Wounds and injuries **$x** Surgery.

650 1 2 Foot **$x** surgery

650 2 2 Ankle **$x** surgery

650 2 2 Foot Deformities **$x** surgery

650 2 2 Foot Injuries **$x** surgery

650 6 Pied **$x** Chirurgie.

650 6 Pied **$x** Lésions et blessures **$x** Chirurgie.

650 6 Cheville **$x** Lésions et blessures **$x** Chirurgie.

650 7 Ankle **$x** Surgery. **$2** fast **$0** (OCoLC)fst00809686

650 7 Ankle **$x** Wounds and injuries **$x** Surgery. **$2** fast **$0** (OCoLC)fst00809689
650 7 Foot **$x** Surgery. **$2** fast **$0** (OCoLC)fst00931326
650 7 Foot **$x** Wounds and injuries **$x** Surgery. **$2** fast **$0** (OCoLC)fst00931341
650 7 Kirurgi. **$2** sao
650 7 Sår och skador. **$2** sao
650 7 Fötter. **$2** sao
700 1 McGlamry, E. Dalton.
700 1 Southerland, Joe T.
856 4 **$u** http://solution.lww.com
856 4 1 **$u** http://public.eblib.com/EBLPublic/PublicView.do?ptiID=2031823
856 4 1 **$u** http://0-site.ebrary.com.oasys.lib.oxy.edu/lib/occidental/Doc?id=10822801 **$z** View this book fro m e-brary (Occidental College authentication required)
938 Ingram Library Services **$b** INGR **$n** in018438592
938 Baker and Taylor **$b** BTCP **$n** BK0010984767
938 Coutts Information Services **$b** COUT **$n** 21119746
938 YBP Library Services **$b** YANK **$n** 8767097
029 1 AU@ **$b** 000050556210
029 1 AU@ **$b** 000052250180
029 1 NLM **$b** 101578321
029 1 NZ1 **$b** 14673244
029 1 AU@ **$b** 000058064406

Attachment 2C

MARC record

LC control no.:	sh 88004474
LCCN Permalink:	https://lccn.loc.gov/sh88004474 (link opens in a new tab)
000	00549nz a2200181n 4500
001	sh 88004474
005	20250804134007.4
003	DLC
008	880725i| anannbabn |n ana
010	$a sh 88004474
035	$a (DLC)sh 88004474
035	$a (DLC)164189
040	$a DLC $c DLC
053 0	$a RD563
150	$a Foot $x Wounds and injuries $x Surgery
670	$a Work cat.: Mackinnon, S.E. Surgery of the peripheral nerve, 1988.
681	$i Example under $a Surgery
999 f f	$i 3642d3ce-9561-4e20-9bb4-5b26f604b212 $s f1084165-9535-48c4-8de2-17e2b8c7aa92

Attachment 2D

MARC record

LC control no.:	sh 85005321
LCCN Permalink:	https://lccn.loc.gov/sh85005321 (link opens in a new tab)
000	00401cz a2200145n 4500
001	sh 85005321
005	20250804132630.9
003	DLC
008	860211i| anannbabn |n ana
010	$a sh 85005321
035	$a (DLC)sh 85005321
035	$a (DLC)5097
040	$a DLC $c DLC $d DLC
150	$a Ankle $x Wounds and injuries
999 f f	$i a44003ee-645c-4fc1-ac52-c977a8430458 $s 6e94a39f-28a5-4c89-a45c-4098271ec1c5

Attachment 2E

MARC record

LC control no.:	sh 85130766
LCCN Permalink:	https://lccn.loc.gov/sh85130766 (link opens in a new tab)
000	00882cz a2200193n 4500
001	sh 85130766
005	20250804133638.2
003	DLC
008	860211i| anannbabn |a ana
010	$a sh 85130766
035	$a (DLC)sh 85130766
035	$a (DLC)126280
040	$a DLC $c DLC $d DLC
053 0	$a RD
150	$a Surgery
360	$i subdivision $a Surgery $i under classes of persons, individual diseases and types of diseases, and individual organs and regions of the body, e.g. $a Children--Surgery; Cancer--Surgery; Heart--Surgery; $i and subdivisions $a Abnormalities--Surgery $i and $a Wounds and injuries--Surgery $i under individual organs and regions of the body, e.g. $a Heart--Abnormalities--Surgery; Foot--Wounds and injuries--Surgery
450	$w nne $a Surgery, Primitive
550	$w g $a Medicine
999 f f	$i 4faaa08d-5919-4a37-befb-1bcc54ec7c95 $s 2595fbbc-0619-44e3-9e86-1bfa4712f638

Attachment 2F

Foot Deformities MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading	Foot Deformities
Tree Number(s)	C05.330
Unique ID	D005530
RDF Unique Identifier	http://id.nlm.nih.gov/mesh/D005530
Annotation	general or unspecified; prefer specifics
Scope Note	Alterations or deviations from normal shape or size which result in a disfigurement of the foot.
Entry Term(s)	Metatarsal Deformity
Previous Indexing	Foot/abnormalities (1966-1987)
Public MeSH Note	88
History Note	88
Entry Combination	congenital:Foot Deformities, Congenital
Date Established	1988/01/01
Date of Entry	1987/04/02
Revision Date	2016/01/20

page delivered in 0.162s

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 2G

Foot Injuries MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Foot Injuries
Tree Number(s)
C26.558.300
Unique ID
D018409
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D018409
Annotation
general or unspecified; prefer specifics; consider also /inj with specific sites of foot
Scope Note
General or unspecified injuries involving the foot.
Entry Version
FOOT INJ
Entry Term(s)
Injuries, Foot
Turf Toe
Previous Indexing
Foot/injuries (1966-1994)
Public MeSH Note
95; was FOOT/injuries 1966-94
Online Note
use FOOT INJURIES to search FOOT/injuries 1966-94
History Note
95; was FOOT/injuries 1966-94
Date Established
1995/01/01
Date of Entry
1994/06/28
Revision Date
2016/02/26

Connect with NLM
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
Web Policies
FOIA
HHS Vulnerability Disclosure
NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 2H

Detailed Record View

Registration record TX0007719165

Copyright Catalog
Displaying 2 of 3 entries

Previous Next

McGlamry's Comprehensive Textbook of Foot and Ankle Surgery - Volumes 1 & 2, 4e.

Share Actions

Registration Number / Date	TX0007719165 / 2013-04-09
Previous Registration	2001
Type of Work	Text
Certificate	View PDF
Title	McGlamry's Comprehensive Textbook of Foot and Ankle Surgery - Volumes 1 & 2, 4e.
Application Title	McGlamry's Comprehensive Textbook of Foot and Ankle Surgery - Volumes 1 & 2, 4e.
Date of Creation	2012

Date of Publication	2012-11-09
Copyright Claimant	Wolters Kluwer Health, Transfer: By written agreement from the editors and individual contributors. Address: 2001 Market St., Two Commerce Square, Philadelphia, PA, 19103, United States.
Authorship on Application	Joe T. Southerland; Domicile: United States. Authorship: text, editing. Daniel F. Vickers; Domicile: United States. Authorship: text, editing. Jeffrey S. Boberg; Domicile: United States. Authorship: text, editing. Michael S. Downey; Domicile: United States. Authorship: text, editing. Aprajita Nakra; Domicile: United States. Authorship: text, editing. Linnie V. Rabjohn; Domicile: United States. Authorship: text, editing.
Basis of Claim	text, editing.
Material Excluded	text.
ISBN	9780781765800
Description	Book, 2 v.
Nation of First Publication	United States
Names	Southerland, Joe T. Vickers, Daniel F. Boberg, Jeffrey S. Downey, Michael S. Nakra, Aprajita Rabjohn, Linnie V. Wolters Kluwer Health

Previous Next

Menu

Home
Recent Records
Recent Searches
Name Directory
Help

Contact

Contact Us
Feedback

Resources

Request a Copy Estimate
Request a Search Estimate
FAQs

U.S. Copyright Office

101 Independence Ave. S.E.
Washington, D.C. 20559-6000
(202) 707-3000 or
1 (877) 476-0778 (toll-free)

Disclaimer: The Copyright Public Records System (CPRS) enables access to records maintained by the U.S. Copyright Office, including searchable indexing information provided by remitters and applicants who certify the information to be accurate. The Office does not verify the accuracy of this information. In addition, the information maintained in the CPRS has been indexed according to cataloging practices and classification systems that have changed over time. For these reasons, there may be gaps and inaccuracies in your search results.

For information on searching copyright records, see How to Investigate the Copyright Status of a Work (Circular 22). You can also request that the Copyright Office perform a search of its records. To request a Search Report, please contact the Records Research and Certification Division. For information on removing personal information from Copyright Office public records, refer to Privacy: Public Copyright Registration Records (Circular 18).

Attachment 5A

MARC Bibliographic Record

LEADER		02571mas a2200661 4500
001		991668513602122
005		20090302144758.0
008		751101d19051993ilumr1p 0 a0eng
010		$a 07005593
012		$a3$b3enj0$k1$md
019		$a07626051$a09584554
022	0_	$a0039-6087
030		$aSGOBA9
035		$a(OCoLC)ocm01766861
035		$9AAT3023UW
035		$a166851
035		$a(WU)166851-uwmadisondb
035		$z(OCoLC)07626051$z(OCoLC)09584554
035		$a(EXLNZ-01UWI_NETWORK)999483422602121
040		$aDLC$beng$cMUL$dNSD$dDLC$dNSD$dSER$dRCS$dNST$dOCL$dAIP$dNST$dNSD$
042		$ansdp$alc
050	00	$aRD1$b.S8
060	0_	$aW1 SU748
069	1_	$aS48320000

082		$a617/.005
210	0_	$aSurg. gynecol. obstet.
222	_0	$aSurgery, gynecology & obstetrics
245	00	$aSurgery, gynecology & obstetrics.
246	0_	$aSurgery, gynecology and obstetrics
246	10	$aSurgery, gynecology and obstetrics
246	13	$aSGO$f<, Feb. 1976>
260		$a[Chicago] :$b[Franklin H. Martin Memorial Foundation, etc.]
300		$a177 volumes :$billustrations, color plates ;$c24-28 cm
336		$atext$btxt$2rdacontent
337		$aunmediated$bn$2rdamedia
338		$avolume$bnc$2rdacarrier
362	0_	$aVol. 1, no. 1 (July 1905)-v. 177, no. 6 (Dec. 1993).
500		$aOfficial scientific journal of the American College of Surgeons.
510	1_	$aExcerpta medica
510	2_	$aBiological abstracts$x0006-3169
510	2_	$aChemical abstracts$x0009-2258
510	2_	$aEnergy research abstracts$x0160-3604
510	2_	$aIndex medicus$x0019-3879
510	2_	$aLife sciences collection
510	0_	$aNuclear science abstracts$x0029-5612
555		$aVols. 1-40, 1905-25. 1 v.; Vols. 41-80, 1925-45. 1 v.; Vols. 8 1945-55. 1 v.; Vols. 101-110, 1955-60. 1 v.; Vols. 111-120, 1960

		v.; Vols. 121-130, 1965-70. 1 v.; Vols. 131-140, 1970-75. 1 v.
500		$aEditor: 1905-<19> F. H. Martin.
650	_0	$aSurgery$vPeriodicals.
650	_0	$aGynecology$vPeriodicals.
650	_0	$aObstetrics$vPeriodicals.
650	_2	$aGynecology$vperiodicals.
650	_2	$aObstetrics$vperiodicals.
650	_2	$aGeneral Surgery$vperiodicals.
700	1_	$aMartin, Franklin H.$q(Franklin Henry),$d1857-1935,$eeditor.
710	2_	$aFranklin H. Martin Memorial Foundation.
710	2_	$aAmerican College of Surgeons.
770	0_	$tInternational abstracts of surgery$w(OCoLC)01587817
785	00	$tJournal of the American College of Surgeons$x1072-7515$w(DLC)sn 93004645$w(OCoLC)29192491
997		$aMARCIVE

MMS IDs

Document ID:

999483422602121

Network Electronic IDs:

Network Physical IDs:

999483422602121

mms_mad_ids:

991668513602122

mms_ml_ids:

9915593783402124

Attachment 5B

MARC record

LC control no.:	sh2008112392
LCCN Permalink:	https://lccn.loc.gov/sh2008112392 (link opens in a new tab)
000	00535nz a2200169n 4500
001	sh2008112392
005	20250804140030.2
003	DLC
008	080311|| anannbabn |n ana
010	$a sh2008112392
035	$a (DLC)388895
035	$a (DLC)sh2008112392
040	$a DLC $b eng $c DLC
150	$a Surgery $v Periodicals
667	$a Record generated for validation purposes.
670	$a Work cat.: Mémoires de l'Académie royale de chirurgie, 1781-
999 f f	$i 454f85a5-f458-4dab-a8ce-16eea78b4636 $s 838d4aed-c618-48e1-98ad-458786f26b21

Attachment 5C

MARC record

LC control no.:	sh2008118506
LCCN Permalink:	https://lccn.loc.gov/sh2008118506 (link opens in a new tab)
000	00516nz a2200169n 4500
001	sh2008118506
005	20250804140059.7
003	DLC
008	080423|| anannbabn |n ana
010	$a sh2008118506
035	$a (DLC)397227
035	$a (DLC)sh2008118506
040	$a DLC $b eng $c DLC
150	$a Gynecology $v Periodicals
667	$a Record generated for validation purposes.
670	$a Work cat.: Women's health issues, c1990-
999 f f	$i b8e567b1-7e1e-4a71-96b8-28bc11a84441 $s b961b150-1083-4db2-a71e-5384d0cb470d

Attachment 5D

MARC record

LC control no.:	sh2008108563
LCCN Permalink:	https://lccn.loc.gov/sh2008108563 (link opens in a new tab)
000	00525nz a2200169n 4500
001	sh2008108563
005	20250804140016.6
003	DLC
008	080305|| anannbabn |n ana
010	$a sh2008108563
035	$a (DLC)384725
035	$a (DLC)sh2008108563
040	$a DLC $b eng $c DLC
150	$a Obstetrics $v Periodicals
667	$a Record generated for validation purposes.
670	$a Work cat.: Current women's health reports, c2001-
999 f f	$i 72a57dab-01a6-4eb9-96fa-f65add379024 $s 830a470b-336f-456f-b832-0bb73ab80dcd

Attachment 5E

Gynecology MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Gynecology
Tree Number(s)
H02.403.763.750
H02.403.810.310
Unique ID
D006176
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D006176
Annotation
specialty; corresponding organ term is GENITALIA, FEMALE
Scope Note
A medical-surgical specialty concerned with the physiology and disorders primarily of the female genital tract, as well as female endocrinology and reproductive physiology.
Entry Version
GYNECOL
See Also
Genital Diseases, Female
Gynecologic Surgical Procedures
Reproductive Medicine
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2021/03/12

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 5F

Obstetrics MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Obstetrics
Tree Number(s)
H02.403.810.450
Unique ID
D009774
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D009774
Annotation
specialty; do not use for "obstetric diseases" (= probably PREGNANCY COMPLICATIONS, etc.)
Scope Note
A medical-surgical specialty concerned with management and care of women during pregnancy, parturition, and the puerperium.
See Also
Obstetric Surgical Procedures
Pregnancy Complications
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2008/07/08

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 5G

General Surgery MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
General Surgery
Tree Number(s)
H02.403.810.300
Unique ID
D013502
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D013502
Annotation
use for the specialty only; prefer /surg with organs and diseases; use SURGICAL PROCEDURES, OPERATIVE or specifics for the surgery patient or surgical procedures
Scope Note
A specialty in which manual or operative procedures are used in the treatment of disease, injuries, or deformities.
Entry Term(s)
Surgery
See Also
Barber Surgeons
Surgical Procedures, Operative
Public MeSH Note
2009; see SURGERY 1974-2008
History Note
2009 (1974)
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2015/06/23

page delivered in 0.133s

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

Attachment 5H

Bibliographic Record - OCLC Number: 1766861

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	' ' - Non-ISBD
001	1766861	
005	20251105200632.8	
008	Date Entered on File	'751101'
	Type of Date/Publication Status	'd' - Continuing resource ceased publication
	Date1/Beginning Date of Publication	'1905'
	Date2/Ending Date of Publication	'1993'
	Place of Publication, Production, or Execution Code	'ilu' - Illinois
	Frequency	'm' - Monthly
	Regularity	'r' - Regular
	Type of Continuing Resource	'p' - Periodical
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	' ' - National bibliographic agency

010 07005593

040 DLC **$b** eng **$c** MUL **$d** NSD **$d** DLC **$d** NSD **$d** SER **$d** RCS **$d** NST **$d** OCL **$d** AIP **$d** NST **$d** NSD **$d** NYG **$d** WAU **$d** DLC **$d** HUL **$d** IXA **$d** OCL **$d** OCLCQ **$d** NLM **$d** OCL **$d** NLGGC **$d** LVB **$d** OCLCQ **$d** TULIB **$d** OCLCF **$d** OCLCO **$d** EUW **$d** OCLCO **$d** OCLCQ **$d** OCLCO **$d** PRB **$d** OCLCO **$d** OCLCQ **$d** OCLCO **$d** OCLCQ **$d** OCLCA **$d** ZAS **$d** OCLCQ **$d** CPO **$d** OCLCQ **$d** OCLCA **$d** CASUM **$d** OCLCO **$d** PAU **$d** OCL **$d** OCLCL **$d** OCLCQ

012 3 **$b** 3 **$e** n **$j** 0 **$k** 1 **$m** d

016 7 0101370 **$2** DNLM

016 7 S48320000 **$2** DNLM

019 7626051 **$a** 9584554 **$a** 779702399 **$a** 783823903 **$a** 976887537 **$a** 1184134847

022 0 0039-6087 **$2** 1

023 0 0039-6087 **$2** 1

030 SGOBA9

042 nsdp

050 1 0 RD1 **$b** .S8

060 0 0 W1 **$b** SU748
082 0 4 617/.005
210 0 Surg. gynecol. obstet.
222 0 Surgery, gynecology & obstetrics
245 0 0 Surgery, gynecology & obstetrics.
246 3 Surgery, gynecology and obstetrics
246 1 3 SGO **$f** <, Feb. 1976>
260 [Chicago], **$b** [Franklin H. Martin Memorial Foundation, etc.]
300 177 volumes **$b** illustrations, color plates **$c** 24-28 cm
310 Monthly
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 0 v. 1-177, no. 6; July 1905-Dec. 1993.
500 Editor: 1905-<19> F.H. Martin.
510 2 Chemical abstracts **$x** 0009-2258
515 Issued in 2 vols. per year; six issues constitute a vol.
550 Official scientific journal of the American College of Surgeons.
555 Vols. 1-40, 1905-25. 1 v.; Vols. 41-80, 1925-45. 1 v.; Vols. 81-100, 1945-55. 1 v.; Vols. 101-110, 1955-60. 1 v.; Vols. 111-120, 1960-65. 1 v.; Vols. 121-130, 1965-70. 1 v.; Vols. 131-140, 1970-75. 1 v.
650 0 Surgery **$v** Periodicals.
650 0 Gynecology **$v** Periodicals.
650 0 Obstetrics **$v** Periodicals.
650 2 General Surgery
650 2 Gynecology
650 2 Obstetrics
650 6 Chirurgie **$v** Périodiques.
650 6 Gynécologie **$v** Périodiques.
650 6 Obstétrique **$v** Périodiques.
650 7 Gynecology. **$2** fast **$0** (OCoLC)fst00949684
650 7 Obstetrics. **$2** fast **$0** (OCoLC)fst01042994
650 7 Surgery. **$2** fast **$0** (OCoLC)fst01139351
650 1 7 Chirurgie (geneeskunde) **$2** gtt
650 1 7 Gynaecologie. **$2** gtt
655 2 Periodical
655 2 Abstracts
655 4 Periodicals.
655 7 Abstracts. **$2** fast **$0** (OCoLC)fst01423683
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
655 7 Periodicals. **$2** lcgft **$0** http://id.loc.gov/authorities/genreForms/gf2014026139
655 7 Abstracts. **$2** lcgft **$0** http://id.loc.gov/authorities/genreForms/gf2014026038
655 7 Periodicals. **$2** rbgenr
700 1 Martin, Franklin H. **$q** (Franklin Henry), **$d** 1857-1935. **$1** https://id.oclc.org/worldcat/entity/E39PBJxt4rDvb3GXjBw4HbyTpP

710 2 Franklin H. Martin Memorial Foundation. **$1** https://id.oclc.org/worldcat/entity/E39QH7Jmrdhpj7kdvjfDKqgjRg

710 2 American College of Surgeons. **$1** https://id.oclc.org/worldcat/entity/E39QH7JmpM7CdcGCBKmwk9mCp6

770 0 **$t** International abstracts of surgery **$w** (OCoLC)1587817

776 0 8 **$i** Online version: **$t** Surgery, gynecology & obstetrics **$w** (OCoLC)741709364

785 0 0 **$t** Journal of the American College of Surgeons **$x** 1072-7515 **$w** (DLC)sn 93004645 **$w** (OCoLC)29192491

850 CSt-L **$a** InLP **$a** MBCo **$a** MCM **$a** N **$a** NcRS **$a** NjR **$a** TxU

029 1 AU@ **$b** 000001219442

029 1 AU@ **$b** 000023016998

029 1 AU@ **$b** 000026074774

029 1 NZ1 **$b** 4847104

029 1 ZWZ **$b** 036503517

Attachment 3A

MARC Bibliographic Record

LEADER		02619cas a22006257a 4500
001		9911025916302121
005		20251106213014.0
006		m o d
007		cr |||||||||||
008		050921c19869999pauqr p o 0 a0eng
010		$a 2005213182
016	7_	$a016630078$2Uk
022		$a1558-2302
023	0_	$a0891-8422$21
029	1_	$aAU@$b000044979773
029	1_	$aNZ1$b15412792
029	1_	$aNZ1$b15904880
029	1_	$aOCLCS$bOP-7696
029	1_	$aUKMGB$b016630078
035		$a(OCoLC)61680715
035		$a(CONSER) 2005213182
035		$a(CKB)954927698005
035		$a(EXLCZ)99954927698005
037		$bElsevier Health Sciences Division, 170 S Independence Mall W 300

040		$aNSD$beng$cNSD$dNSD$dOCLCQ$dLGG$dDLC$dOCLCQ$dOPELS$dOCLCF$dFFQ$dC
042		$ansdp$apcc
050	14	$aRD563$b.C63
082	00	$a617/.585/005$219
130	0_	$aClinics in podiatric medicine and surgery (Online)
210	0_	$aClin. podiatr. med. surg.$b(Online)
222	_0	$aClinics in podiatric medicine and surgery$b(Online)
245	10	$aClinics in podiatric medicine and surgery.
246	18	$aPodiatric medicine and surgery
246	1_	$iVols. for <2005-> have PDF cover title:$aClinics in podiatric me
246	13	$aCPEM
260		$aPhiladelphia, PA :$bW.B. Saunders Co.
310		$aQuarterly
336		$atext$btxt$2rdacontent
337		$acomputer$bc$2rdamedia
338		$aonline resource$bcr$2rdacarrier
362	1_	$aPrint began with vol. 3, no. 1 (Jan. 1986).
500		$aRefereed/Peer-reviewed
500		$aPublished: Elsevier Health Sciences Division <2005->
588		$aDescription based on: Vol. 19, no. 1 (Jan. 2002); title from ban
588		$aLatest issue consulted: Vol. 22, Issue 3 (Aug. 2005) (Elsevier T
650	_0	$aPodiatry$vPeriodicals.

650	_0	$aFoot$xSurgery$vPeriodicals.
650	_2	$aPodiatry.
650	_6	$aPied$xChirurgie$vPériodiques.
650	_7	$aFoot$xSurgery.$2fast$0(OCoLC)fst00931326
650	_7	$aPodiatry.$2fast$0(OCoLC)fst01067635
655	_2	$aPeriodical.
655	_7	$aPeriodicals.$2fast$0(OCoLC)fst01411641
776	08	$x0891-8422
780	00	$tClinics in podiatry$w(CKB)954927686727
906		$aJOURNAL

MMS IDs

Document ID:

9911025916302121

Network Electronic IDs:

9911025916302121

Network Physical IDs:

Attachment 3B

MARC record

LC control no.:	sh 85103669
LCCN Permalink:	https://lccn.loc.gov/sh85103669 (link opens in a new tab)
000	00532nz a2200205n 4500
001	sh 85103669
005	20250804133431.9
003	DLC
008	860211i| anannbabn |b ana
010	$a sh 85103669
035	$a (DLC)sh 85103669
035	$a (DLC)100060
040	$a DLC $c DLC $d DLC
053 0	$a RD563
150	$a Podiatry
450	$w nne $a Chiropody
450	$a Podiatric medicine
550	$w g $a Medicine
550	$a Foot $x Diseases
999 f f	$i 66d14e6e-6ee7-4ef9-bd37-9f15fa7fc79e $s 74f9c8f8-c52d-4a0d-876b-2cfdd9c1ceb2

Attachment 3C

Podiatry MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Podiatry
Tree Number(s)
H02.696
Unique ID
D011032
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D011032
Annotation
for /educ, coordinate with medical education terms if pertinent
Scope Note
A specialty concerned with the diagnosis and treatment of foot disorders and injuries and anatomic defects of the foot.
Entry Term(s)
Chiropody
NLM Classification #
WE 890
See Also
Foot Diseases
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2008/07/08

Attachment 3D

Bibliographic Record - OCLC Number: 13324960

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	13324960	
005	20251105200604.7	
008	Date Entered on File	'860321'
	Type of Date/Publication Status	'c' - Continuing resource currently published
	Date1/Beginning Date of Publication	'1986'
	Date2/Ending Date of Publication	'9999'
	Place of Publication, Production, or Execution Code	'pau' - Pennsylvania
	Frequency	'q' - Quarterly
	Regularity	'r' - Regular
	Type of Continuing Resource	' ' - None of the following
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	'c' - Cooperative cataloging program

010 86643213 **$z** 2005201925

040 CLU **$b** eng **$c** CLU **$d** NLM **$d** DLC **$d** NST **$d** DLC **$d** NST **$d** NSD **$d** NST **$d** NSD **$d** OCLCQ **$d** NSD **$d** DLC **$d** NLM **$d** NSD **$d** DLC **$d** OCLCQ **$d** CUX **$d** OCLCF **$d** OCL CO **$d** DLC **$d** OCLCQ **$d** AU@ **$d** OCLCO **$d** OCLCQ

012 3 **$i** 8612 **$k** 1 **$l** p **$m** 1

015 GB8817364 **$2** bnb

016 7 8604974 **$2** DNLM

016 7 SR0056206 **$2** DNLM

019 56890144 **$a** 1051561645 **$a** 1056938285 **$a** 1226063254

022 0 0891-8422 **$y** 0742-0668 **$z** 1559-6486 **$2** 1

023 0 0891-8422 **$2** 1

032 000707 **$b** USPS

037 **$b** W.B. Saunders, West Washington Square, Philadelphia, PA 19105

042 pcc **$a** nsdp

043 n------

050 0 0 RD563 **$b** .C63

060 0 0 W1 **$b** CL831DE
082 0 0 617/.585/005 **$2** 19
210 0 Clin. podiatr. med. surg.
222 0 Clinics in podiatric medicine and surgery
245 0 0 Clinics in podiatric medicine and surgery.
246 1 8 Podiatric medicine and surgery
246 1 **$i** Vols. for 2004- called: **$a** Clinics in podiatric medicine and surgery of North America
260 **$3** 1986- : **$a** Philadelphia : **$b** W.B. Saunders, **$c** ©1986-
260 3 **$3** <2014-> **$a** New York, NY : **$b** Elsevier Inc.
300 18 volumes : **$b** illustrations, portraits ; **$c** 24 cm
310 Quarterly
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 0 Vol. 3, no. 1 (Jan. 1986)-
500 Each volume has also a distinctive title.
530 Also issued online.
650 0 Podiatry **$v** Periodicals.
650 0 Foot **$x** Surgery **$v** Periodicals.
650 1 2 Podiatry.
650 1 2 Foot **$x** surgery.
651 2 North America.
650 7 Foot **$x** Surgery. **$2** fast **$0** (OCoLC)fst00931326
650 7 Podiatry. **$2** fast **$0** (OCoLC)fst01067635
653 Health and medical sciences
653 Man **$a** Feet **$a** Diseases
655 2 Periodical.
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
776 1 **$t** Clinics in podiatric medicine and surgery (Online) **$x** 1558-2302 **$w** (DLC) 2005213182 **$w** (OCoLC)61680715
776 0 8 **$i** Online version: **$t** Clinics in podiatric medicine and surgery **$w** (OCoLC)732993715
780 0 0 **$t** Clinics in podiatry **$x** 0742-0668 **$w** (DLC) 84646078 **$w** (OCoLC)10255369
850 CU-AM **$a** CU-SM **$a** DLC **$a** DNLM **$a** IaU **$a** NNNAM **$a** WaU
856 4 1 **$u** http://www.podiatric.theclinics.com/
029 1 AU@ **$b** 000004684678
029 1 AU@ **$b** 000023036562
029 1 AU@ **$b** 000028662231
029 1 AU@ **$b** 000043638890
029 1 AU@ **$b** 000053310012
029 1 NLGGC **$b** 865337578
029 1 NLM **$b** 8604974
029 1 NZ1 **$b** 3660689
029 1 ZWZ **$b** 039989895
029 1 NZ1 **$b** 207449

029 1 NLNZL **$b** 992074493502836

Attachment 9A

Bibliographic Record - OCLC Number: 27182191

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	27182191	
005	20251105200619.6	
008	Date Entered on File	'921230'
	Type of Date/Publication Status	'c' - Continuing resource currently published
	Date1/Beginning Date of Publication	'1993'
	Date2/Ending Date of Publication	'9999'
	Place of Publication, Production, or Execution Code	'mdu' - Maryland
	Frequency	'b' - Bimonthly
	Regularity	'r' - Regular
	Type of Continuing Resource	'p' - Periodical
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	'c' - Cooperative cataloging program

010 sn 92006834

040 NSD **$b** eng **$c** NSD **$d** CAS **$d** NST **$d** WAU **$d** EYM **$d** NLM **$d** HUL **$d** SYS **$d** OCLCQ **$d** PIT **$d** NSD **$d** OCLCQ **$d** CLU **$d** ITD **$d** OCLCQ **$d** AU@ **$d** UKMGB **$d** OCLCQ **$d** OCLCO **$d** OCLCQ **$d** OCLCF **$d** OCLCO **$d** OCLCA **$d** DLC **$d** OCLCA **$d** OCLCQ **$d** O CLCL **$d** OCLCQ

012 **$i** 9304 **$j** 0 **$k** 1 **$l** 1 **$m** 1

016 7 9308427 **$2** DNLM

016 7 SR0076946 **$2** DNLM

016 7 012433868 **$2** Uk

016 7 012116839 **$2** Uk

019 221526201 **$a** 995484954 **$a** 1053978593 **$a** 1063456326 **$a** 1089787521

022 0 1067-2516 **$2** j

023 0 1067-2516 **$2** j

030 JFSUEI

032 922540 **$b** USPS

037 **$b** Williams & Wilkins, 428 E. Preston St., Baltimore, MD 21202

042 nsdp **$a** pcc
050 4 RD560
060 0 0 W1 **$b** JO652S
082 1 0 617 **$2** 12 **$1** https://id.oclc.org/worldcat/ddc/E3YM8MMTVgYPgDmxF4cHh8XGcP
210 0 J. foot ankle surg.
222 4 The Journal of foot and ankle surgery
245 0 4 The Journal of foot and ankle surgery.
260 Baltimore, MD : **$b** Williams & Wilkins, **$c** ©1993-
300 volumes : **$b** illustrations ; **$c** 28 cm
310 Bimonthly
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 0 Vol. 32, no. 1 (Jan./Feb. 1993)-
500 Title from cover.
500 Published: Baltimore, MD : Data Trace Pub., <1998->
530 Also issued in online version.
550 "Official journal of the American College of Foot and Ankle Surgeons."
650 0 Ankle **$x** Surgery **$v** Periodicals.
650 0 Foot **$x** Surgery **$v** Periodicals.
650 2 Ankle **$x** surgery.
650 2 Foot **$x** surgery.
650 7 Ankle **$x** Surgery. **$2** fast **$0** (OCoLC)fst00809686
650 7 Foot **$x** Surgery. **$2** fast **$0** (OCoLC)fst00931326
655 2 Periodical.
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
710 2 American College of Foot and Ankle Surgeons. **$1** https://id.oclc.org/worldcat/entity/E39QH7JmqhfH ftRmw3VbPc3FhR
776 1 **$t** Journal of foot and ankle surgery (Online) **$x** 1542-2224 **$w** (DLC) 2002213269 **$w** (OCoLC)50 849610
780 0 0 **$t** Journal of foot surgery **$x** 0449-2544 **$w** (DLC)sn 79006255 **$w** (OCoLC)3711674
850 DNLM **$a** MiU **$a** MoSW-M **$a** WaU
856 4 1 **$u** http://www.sciencedirect.com/science/journal/10672516
856 4 1 **$u** http://www.jfas.org
891 3 3 **$9** 853 **$8** 1 **$a** v. **$b** no. **$u** 06 **$v** r **$i** (year) **$j** (month/month) **$w** b **$x** 01
891 4 0 **$9** 863 **$8** 1 **$a** <33> **$i** <1994> **$x** provisional
029 1 AU@ **$b** 000009838820
029 1 AU@ **$b** 000023036808
029 1 AU@ **$b** 000053142085
029 1 NLGGC **$b** 106063979
029 1 NLM **$b** 9308427
029 1 NZ1 **$b** 3847676
029 1 ZWZ **$b** 04030227X
029 1 UKMGB **$b** 012116839

Attachment 4A

MARC Bibliographic Record

LEADER		02461cas a2200577 a 4500
001		9910219743018022122
005		20250927110031.0
006		m o d
007		cr un|||||||||
008		050614d19531962pauuu o 0 a0eng c
010		$a 2013236800
022		$a2332-3906
035		$a(DE-599)ZDB2273090-4
035		$a(OCoLC)60624421
035		$a(CONSER) 2013236800
035		$a(CKB)991042742033474
035		$a(DE-599)2273090-4
035		$a(EXLCZ)99991042742033474
040		$aOCLCS$beng$cOCLCS$dOCLCQ$dMYG$dOCLCQ$dNOC$dOCLCE$dSFB$dQE2$dOCLC
042		$apcc$adlr$ansdp
050	_4	$aRD701$b.C55
060	_4	$aW1$bCL761
082	00	$a617.47$223$1https://id.oclc.org/worldcat/ddc/E4bWMVWKYJwk8yxJy4W
130	0_	$aClinical orthopaedics (Online)

210	0_	$aClin. orthop.$b(Online)
222	_0	$aClinical orthopaedics$b(Online)
245	10	$aClinical orthopaedics.
260		$a[Philadelphia] :$b[Lippincott]
336		$atext$btxt$2rdacontent
337		$acomputer$bc$2rdamedia
338		$aonline resource$bcr$2rdacarrier
362	1_	$aPrint began with no. 1, published in 1953.
362	1_	$aPrint ceased with no. 25.
530		$aAlso issued in print.
538		$aMaster and use copy. Digital master created according to Benchma Library Federation, December 2002.$uhttp://purl.oclc.org/DLF/bench
538		$aMode of access: World Wide Web.
555		$aNo. 1 (spring 1953)-no. 6 (fall 1955). 1 v.; No. 7 (spring 1956)
583	1_	$adigitized$c2011$hHathiTrust Digital Library$lcommitted to preser
588		$aDescription based on print version record.
650	_0	$aOrthopedics$vPeriodicals.
650	_0	$aOrthopedic surgery$vPeriodicals.
650	_2	$aBone and Bones$vPeriodicals.
650	_2	$aOrthopedics$vPeriodicals.
650	_2	$aBone and Bones.
650	_2	$aOrthopedics.
650	_7	$aOrthopedic surgery.$2fast$0(OCoLC)fst01048559

650	_7	$aOrthopedics.$2fast$0(OCoLC)fst01048565
655	_2	$aPeriodical.
655	_7	$aPeriodicals.$2fast$0(OCoLC)fst01411641
776	08	$x0095-8654
785	00	$tCLINICAL ORTHOPAEDICS AND RELATED RESEARCH$w(CKB)954925391294$w(
906		$aJOURNAL

MMS IDs

Document ID:

9911121818302121

Network Electronic IDs:

9911121818302121

Network Physical IDs:

999482902802121

mms_mad_ids:

991021974301802122

mms_lc_ids:

99992913402125

Attachment 4B

MARC record

LC control no.:	sh2010104613
LCCN Permalink:	https://lccn.loc.gov/sh2010104613 (link opens in a new tab)
000	00519nz a2200169n 4500
001	sh2010104613
005	20250804140332.9
003	DLC
008	100324|| anannbabn |n ana
010	$a sh2010104613
035	$a (DLC)460600
035	$a (DLC)sh2010104613
040	$a DLC $b eng $c DLC
150	$a Orthopedics $v Periodicals
667	$a Record generated for validation purposes.
670	$a Work cat.: Acta orthopaedica Scandinavica,
999 f f	$i 6dd91cee-a6fd-452c-be0f-1ef731200a69 $s cd994a32-f7b6-4854-9409-927ebeed5163

Attachment 4C

MARC record

LC control no.:	sh 85095812
LCCN Permalink:	https://lccn.loc.gov/sh85095812 (link opens in a new tab)
000	00530nz a2200193n 4500
001	sh 85095812
005	20250804133344.9
003	DLC
008	860211i| anannbabn |b ana
010	$a sh 85095812
035	$a (DLC)sh 85095812
035	$a (DLC)92436
040	$a DLC $c DLC $d DLC
053 0	$a RD701 $b RD789
150	$a Orthopedic surgery
450	$a Operative orthopedics
550	$w g $a Orthopedics
550	$w g $a Surgery, Operative
999 f f	$i d2582f55-4a55-40b3-bd9c-1fe66278bd7e $s 2c1bacbe-c768-401b-9154-29cf4c263044

Attachment 4D

Bone and Bones MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Bone and Bones
Tree Number(s)
A02.835.232
A10.165.265
Unique ID
D001842
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D001842
Annotation
/cytol: consider also OSTEOBLASTS; OSTEOCLASTS; OSTEOCYTES; /embryol: consider also OSTEOGENESIS; /surg: consider also OSTEOTOMY or ARTHRODESIS or FRACTURE FIXATION & its specifics; differentiate from SKELETON which is almost never used: restrict SKELETON to bone arrangement as a whole & not for "skeletal" which usually means "bone" (= BONE AND BONES); inflammation = OSTEITIS; necrosis = OSTEONECROSIS;
Scope Note
A specialized CONNECTIVE TISSUE that is the main constituent of the SKELETON. The principal cellular component of bone is comprised of OSTEOBLASTS; OSTEOCYTES; and OSTEOCLASTS, while FIBRILLAR COLLAGENS and hydroxyapatite crystals form the BONE MATRIX.
Entry Version
BONE BONES
Entry Term(s)
Bone
Bone Tissue
Bone and Bone
Bones
Bones and Bone
Bones and Bone Tissue
Bony Apophyses
Bony Apophysis
Condyle
See Also
Arthrodesis
Calcification, Physiologic
Osteogenesis
Osteotomy
Consider Also
consider also terms at OSSI- and OSTE-
Public MeSH Note
/transplantation was BONE TRANSPLANTATION 1963-65; was BONE AND BONES/transplantation 1966-89
Online Note
use BONE TRANSPLANTATION to search BONE AND BONES/transplantation 1966-89

History Note
/transplantation was BONE TRANSPLANTATION 1963-65; was BONE AND BONES/transplantation 1966-89
Entry Combination
growth & development:Bone Development
transplantation:Bone Transplantation
Date Established
1960/01/01
Date of Entry
1999/01/01
Revision Date
2021/06/30

page delivered in 0.134s

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 4E

Orthopedics MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Orthopedics
Tree Number(s)
H02.403.810.494
Unique ID
D009985
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D009985
Annotation
specialty; ORTHOPEDIC PROCEURES is available for orthopedic therapeutic techniques
Scope Note
A specialty which utilizes medical, surgical, and physical methods to treat and correct deformities, diseases, and injuries to the skeletal system, its articulations, and associated structures.
NLM Classification #
WE 21
See Also
Orthopedic Procedures
Osteology
Entry Combination
instrumentation:Orthopedic Equipment
nursing:Orthopedic Nursing
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2019/07/05

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 4F

Bibliographic Record - OCLC Number: 1778089

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	1778089	
005	20251105200621.8	
008	Date Entered on File	'751101'
	Type of Date/Publication Status	'd' - Continuing resource ceased publication
	Date1/Beginning Date of Publication	'1953'
	Date2/Ending Date of Publication	'1962'
	Place of Publication, Production, or Execution Code	'pau' - Pennsylvania
	Frequency	'u' - Unknown
	Regularity	'u' - Unknown
	Type of Continuing Resource	' ' - None of the following
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	' ' - National bibliographic agency

010 sf 85003079 **$z** 53007647

040 DLC **$b** eng **$c** MUL **$d** NSD **$d** RCS **$d** DLC **$d** OCL **$d** NST **$d** OCLCQ **$d** MXC **$d** NL M **$d** CUS **$d** AU@ **$d** OCLCQ **$d** HEBIS **$d** GBVCP **$d** GWDNB **$d** UKMGB **$d** NOC **$d** OCLCQ **$d** OCLCO **$d** DLC **$d** OCLCF **$d** OCLCO **$d** DEBBG **$d** EUW **$d** OCLCO **$d** OCL CQ **$d** OCLCO **$d** I8M **$d** OCLCO **$d** OCLCQ **$d** OCLCA **$d** GILDS **$d** KSU **$d** OCLCO **$d** OCLCQ **$d** OCLCO **$d** OCLCA **$d** OCLCQ **$d** DCHUA **$d** TKN **$d** OCLCL **$d** OCLCQ

012 3 **$b** 3 **$e** n **$i** 8505

016 7 012154059 **$2** DE-101

016 7 983373248 **$2** DE-101

016 7 2273090-4 **$2** DE-600

016 7 391221-8 **$2** DE-600

016 7 101242526 **$2** DNLM

016 7 012396419 **$2** Uk

019 4947943 **$a** 220766516 **$a** 1078804200 **$a** 1157022635 **$a** 1157782645 **$a** 1157941296 **$a** 11924 08201 **$a** 1199937763 **$a** 1238182393

022 0095-8654 **$2** 1

023 0 0095-8654 **$2** 1
042 nsdp **$a** pcc
050 0 0 RD701 **$b** .C55
060 0 0 W1 **$b** CL761
210 1 0 Clin Orthop
222 0 Clinical orthopaedics
245 0 0 Clinical orthopaedics.
260 [Philadelphia] : **$b** [Lippincott], **$c** [-1962]
300 25 volumes : **$b** illustrations ; **$c** 26 cm
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 1 Began with: No. 1, published in 1953.
362 0 -no. 25.
555 No. 1 (spring 1953)-no. 6 (fall 1955). 1 v.; No. 7 (spring 1956)-no. 12 (fall 1958) in no. 13; No. 13-no. 18, in no. 19; No. 19-no. 24, in no. 25.
588 Description based on: No. 25, published in 1962.
650 0 Orthopedics **$v** Periodicals.
650 2 Bone and Bones.
650 2 Orthopedics.
650 6 Orthopédie **$v** Périodiques.
650 7 Orthopedics. **$2** fast **$0** (OCoLC)fst01048565
655 2 Periodical.
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
655 7 Periodicals. **$2** lcgft
655 7 Periodicals. **$2** rbgenr
776 0 8 **$i** Online version: **$t** Clinical orthopaedics (Online) **$x** 2332-3906 **$w** (DLC) 2013236800 **$w** (OCoLC)60624421
785 0 0 **$t** Clinical orthopaedics and related research **$x** 0009-921X **$w** (DLC) 53007647 **$w** (OCoLC)1554937
850 CU-AM **$a** DLC **$a** MnSU **$a** NjR
029 1 AU@ **$b** 000004480787
029 1 AU@ **$b** 000007253898
029 1 NLGGC **$b** 851924816
029 1 NZ1 **$b** 3648080
029 1 ZWZ **$b** 036649341
029 1 UKMGB **$b** 012396419

Attachment 8A

LDR	01579cas a2200517 a 4500
001	998174893406676
005	20250227142239.0
007	cr|cn#||||||||
008	961219c19969999pauqr p 0||| 0eng
010	__ | **a**sn 95005854
022	__ | **a**1083-7515**l**1083-7515**9**PY**7**(Print)
022	__ | **a**1558-1934**9**EN**7**(Electronic)
035	__ | **9**9615073
040	__ | **a**DNLM**c**DNLM
041	0_ | **a**eng
044	__ | **9**United States
060	00 | **a**W1**b**FO511RR
210	10 | **a**Foot Ankle Clin**2**DNLM
222	_0 | **a**Foot and ankle clinics
245	00 | **a**Foot and ankle clinics.
260	__ | **a**Philadelphia :**b**W.B. Saunders,**c**c1996-
300	__ | **a**v. :**b**ill.
310	__ | **a**Quarterly
336	__ | **a**text**b**txt**2**rdacontent
337	__ | **a**unmediated**b**n**2**rdamedia
338	__ | **a**volume**b**nc**2**rdacarrier
362	0_ | **a**Vol. 1, no. 1 (Sept. 1996)-
500	__ | **a**Each issue has also a distinctive title.
510	1_ | **9**1**a**MEDLINE**b**v5n1, Mar. 2000-
510	1_ | **9**1**a**PubMed**b**v5n1, Mar. 2000-
510	1_ | **a**Index medicus
530	__ | **a**Also issued online.
650	_2 | **a**Ankle Injuries
650	_2 | **a**Foot Diseases
650	_2 | **a**Foot Injuries
655	_2 | **a**Periodical
856	4_ | **u**https://www.sciencedirect.com/journal/foot-and-ankle-clinics
911	__ | **a**Electronic and print, print canceled 2018
914	__ | **a**Portico**b**Current to 2025 as of 20250227**c**ISSN_10837515
935	__ | **a**(DNLM)817489-nlmdb
995	__ | **a**AUTH**b**19961219**c**REV**d**20250227
996	__ | **a**NOTCNSR**b**20000101
998	__ | **a**ERMSLC 108649**b**20081003
999	__ | **a**AUTH
035	__ | **a**(DNLM)SR0085591(s)

035	__ | **a**(OCoLC)32877539

Attachment 8B

Bibliographic Record - OCLC Number: 32877539

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	32877539	
005	20251105200603.7	
008	Date Entered on File	'950726'
	Type of Date/Publication Status	'c' - Continuing resource currently published
	Date1/Beginning Date of Publication	'1996'
	Date2/Ending Date of Publication	'9999'
	Place of Publication, Production, or Execution Code	'pau' - Pennsylvania
	Frequency	'q' - Quarterly
	Regularity	'r' - Regular
	Type of Continuing Resource	'p' - Periodical
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	'c' - Cooperative cataloging program

010 sn 95005854

040 NSD **$b** eng **$c** NSD **$d** NLM **$d** NSD **$d** NLM **$d** OCLCQ **$d** NSD **$d** AU@ **$d** OCLCQ **$d** UKMGB **$d** OCLCF **$d** OCLCO **$d** OCLCQ **$d** OCLCO **$d** OCLCL **$d** OCLCQ

012 **$i** 9612 **$k** 1 **$l** 1 **$m** 1

016 7 9615073 **$2** DNLM

016 7 SR0085591 **$2** DNLM

016 7 008533515 **$2** Uk

019 1063258787

022 0 1083-7515 **$2** 1

023 0 1083-7515 **$2** 1

032 016368 **$b** USPS

037 **$b** W.B. Saunders Company, Periodicals Fulfillment, Orlando, FL 32887-4800 **$c** $99.00

042 nsdp **$a** pcc

060 0 0 W1 **$b** FO511RR

082 1 0 616 **$2** 12 **$1** https://id.oclc.org/worldcat/ddc/E3JgrcHwDwT3D4ty3F7FPPcp7d

210 0 Foot ankle clin.
222 0 Foot and ankle clinics
245 0 0 Foot and ankle clinics.
260 Philadelphia : **$b** W.B. Saunders, **$c** ©1996-
300 volumes : **$b** illustrations
310 Quarterly
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 0 Vol. 1, no. 1 (Sept. 1996)-
500 Each issue has also a distinctive title.
530 Also issued online.
650 0 Ankle **$x** Wounds and injuries **$v** Periodicals.
650 0 Foot **$x** Diseases **$v** Periodicals.
650 0 Foot **$x** Wounds and injuries **$v** Periodicals.
650 2 Ankle Injuries.
650 2 Foot Diseases.
650 2 Foot Injuries.
650 6 Pied **$x** Lésions et blessures **$v** Périodiques.
650 6 Cheville **$x** Lésions et blessures **$v** Périodiques.
650 6 Pied **$x** Maladies **$v** Périodiques.
650 7 Ankle **$x** Wounds and injuries. **$2** fast **$0** (OCoLC)fst00809687
650 7 Foot **$x** Diseases. **$2** fast **$0** (OCoLC)fst00931290
650 7 Foot **$x** Wounds and injuries. **$2** fast **$0** (OCoLC)fst00931336
655 2 Periodicals.
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
776 1 **$t** Foot and ankle clinics (Online) **$x** 1558-1934 **$w** (DLC) 2005213173
850 DNLM
856 4 1 **$u** http://www.foot.theclinics.com/
029 1 AU@ **$b** 000011867824
029 1 AU@ **$b** 000053310029
029 1 GEBAY **$b** 6488074
029 1 NLM **$b** 9615073
029 1 ZWZ **$b** 040343863
029 1 UKMGB **$b** 008533515

Attachment 8C

MARC record

LC control no.:	sh 85050368
LCCN Permalink:	https://lccn.loc.gov/sh85050368 (link opens in a new tab)
000	00610nz a2200205n 4500
001	sh 85050368
005	20250804133017.2
003	DLC
008	860211i| anannbabn |a ana
010	$a sh 85050368
035	$a (DLC)sh 85050368
035	$a (DLC)48716
040	$a DLC $c DLC $d DLC
053 0	$a RC951
150	$a Foot $x Diseases
450	$a Foot diseases
550	$a Podiatry
670	$a MESH $b (Foot diseases)
681	$i Example under $a Pathology; $i and under reference from $a Diseases of the heart, [foot, etc.]
999 f f	$i b71949d9-1f49-445e-8d48-16b6a937c4f6 $s 95a88f92-1815-4402-9af9-59dff3a2ec37

Attachment 8D

MARC record

LC control no.:	sh 85050397
LCCN Permalink:	https://lccn.loc.gov/sh85050397 (link opens in a new tab)
000	00474cz a2200169n 4500
001	sh 85050397
005	20250804133017.6
003	DLC
008	860211i| anannbabn |n ana
010	$a sh 85050397
035	$a (DLC)sh 85050397
035	$a (DLC)48745
040	$a DLC $c DLC $d DLC
053 0	$a RD563
150	$a Foot $x Wounds and injuries
681	$i Example under $a Wounds and injuries
999 f f	$i 5f5f9368-84b3-40dc-9f8c-8b144ff7483b $s 3229dade-bbc2-4261-8f92-52ba570c0fa7

Attachment 7C

Foot Diseases MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Foot Diseases
Tree Number(s)
C05.360
C17.800.321
Unique ID
D005534
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D005534
Annotation
skin disease on foot = FOOT DERMATOSES; neoplasms of foot: coordinate FOOT DISEASES with appropriate neoplasm terms
Scope Note
Anatomical and functional disorders affecting the foot.
Entry Version
FOOT DIS
Date Established
1966/01/01
Date of Entry
1999/01/01
Revision Date
2016/04/26

page delivered in 0.19s

Connect with NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

Web Policies
FOIA
HHS Vulnerability Disclosure

NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 7G

Ankle Injuries MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Ankle Injuries
Tree Number(s)
C26.558.100
Unique ID
D016512
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D016512
Annotation
consider also TARSAL BONES /inj
Scope Note
Harm or hurt to the ankle or ankle joint usually inflicted by an external source.
Entry Version
ANKLE INJ
Entry Term(s)
Ankle Sprains
Injuries, Ankle
Syndesmotic Injuries
NLM Classification #
WE 882
Previous Indexing
Ankle/injuries (1966-1991)
Public MeSH Note
92; was ANKLE/injuries 1966-91
Online Note
use ANKLE INJURIES to search ANKLE/injuries 1966-91
History Note
92; was ANKLE/injuries 1966-91
Date Established
1992/01/01
Date of Entry
1991/05/31
Revision Date
2013/07/08

Attachment 7H

Foot Injuries MeSH Descriptor Data 2025

Details | Qualifiers | MeSH Tree Structures | Concepts

MeSH Heading
Foot Injuries
Tree Number(s)
C26.558.300
Unique ID
D018409
RDF Unique Identifier
http://id.nlm.nih.gov/mesh/D018409
Annotation
general or unspecified; prefer specifics; consider also /inj with specific sites of foot
Scope Note
General or unspecified injuries involving the foot.
Entry Version
FOOT INJ
Entry Term(s)
Injuries, Foot
Turf Toe
Previous Indexing
Foot/injuries (1966-1994)
Public MeSH Note
95; was FOOT/injuries 1966-94
Online Note
use FOOT INJURIES to search FOOT/injuries 1966-94
History Note
95; was FOOT/injuries 1966-94
Date Established
1995/01/01
Date of Entry
1994/06/28
Revision Date
2016/02/26

Connect with NLM
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
Web Policies
FOIA
HHS Vulnerability Disclosure
NLM Support Center
Accessibility
Careers

NLM | NIH | HHS | USA.gov

Attachment 14A

MARC Bibliographic Record

LEADER		03064cas a2200793 a 4500
001		991021975490902122
005		20251105213014.0
006		m o d
007		cr cnu||||||||
008		021023c19939999moubr pso 0 a0eng c
010		$a 2002213269
016	7_	$a2102633-6$2DE-600
016	7_	$aSR0076946$2DNLM
016	7_	$a012433868$2Uk
022		$a1542-2224
023	0_	$a1067-2516$2j
029	1_	$aAU@$b000024168319
029	1_	$aAU@$b000043709187
029	1_	$aAU@$b000043829991
029	1_	$aAU@$b000044932653
029	1_	$aAU@$b000045723703
029	1_	$aNZ1$b16239705
029	1_	$aNZ1$b7257189
029	1_	$aOCLCS$b31565

029	1_	$aOCLCS$bOP-4455
029	1_	$aUKMGB$b012433868
029	1_	$aZWZ$b083136029
029	1_	$aDKDLA$b820120-katalog:9910109786605765
035		$a(DE-599)ZDB2102633-6
035		$a(DE-599)2102633-6
035		$a(OCoLC)50849610
035		$a(CONSER) 2002213269
035		$a(CKB)954927726566
035		$a(EXLCZ)99954927726566
037		$bMosby, 6277 Sea Harbor Dr., Orlando, FL 32887c162.00 (Institut
040		$aNSD$beng$cNSD$dOCLCQ$dPIT$dSBH$dNSD$dOCLCQ$dVRC$dUQ1$dOCLCQ$dOPE
042		$apcc$ansdp
060	00	$aW1$bJO652S
082	10	$a617$213$1https://id.oclc.org/worldcat/ddc/E3YM8MMTVgYPgDmxF4cHh8
130	0_	$aJournal of foot and ankle surgery (Online)
222	_0	$aJournal of foot and ankle surgery$b(Online)
245	14	$aThe journal of foot and ankle surgery.
260		$aOrlando, FL :$bMosby
300		$a1 online resource
310		$aBimonthly
336		$atext$btxt$2rdacontent

337		$acomputer$bc$2rdamedia
338		$aonline resource$bcr$2rdacarrier
362	1_	$aPrint began with v. 32, no. 1 (Jan./Feb. 1993).
500		$aRefereed/Peer-reviewed
588	1_	$aVol. 64, no. 4 (Jul./Aug. 2025) (ScienceDirect, viewed July 31,
650	_0	$aAnkle$xSurgery$vPeriodicals.
650	_0	$aFoot$xSurgery$vPeriodicals.
650	_2	$aAnkle$xsurgery
650	_2	$aFoot$xsurgery
650	_6	$aPied$xChirurgie$vPériodiques.
650	_7	$aAnkle$xSurgery.$2fast$0(OCoLC)fst00809686
650	_7	$aFoot$xSurgery.$2fast$0(OCoLC)fst00931326
650	_7	$aChirurgie orthopédique.$2rasuqam
650	_7	$aPied.$2rasuqam
650	_7	$aCheville.$2rasuqam
655	_2	$aPeriodical
655	_7	$aPeriodicals.$2fast$0(OCoLC)fst01411641
655	_7	$aPeriodicals.$2lcgft
655	_7	$aPériodique électronique (Descripteur de forme)$2rasuqam
655	_7	$aRessource Internet (Descripteur de forme)$2rasuqam
710	2_	$aAmerican College of Foot and Ankle Surgeons,$eissuing body.
776	08	$x1067-2516

780	00	$tThe Journal of foot surgery$w(CKB)954927674396
906		$aJOURNAL

MMS IDs

Document ID:

9911025879602121

Network Electronic IDs:

9911025879602121, 9913567518002121

Network Physical IDs:

mms_lc_ids:

991016482763302125

mms_mad_ids:

991021975490902122

mms_osh_ids:

991004596210102126

mms_sf_ids:

991015536223602130

mms_st_ids:

991013519966702131

mms_ww_ids:

991015831233202133

mms_plt_ids:

991013837562802128

Attachment 14B

Bibliographic Record - OCLC Number: 27182191

LDR	Record Status	'c' - Corrected or revised
	Type of Record	'a' - Language material
	Bibliographic Level	's' - Serial
	Type of Control	' ' - No specified type of control
	Encoding Level	' ' - Full level
	Descriptive Cataloging Form	'a' - AACR2
001	27182191	
005	20251105200619.6	
008	Date Entered on File	'921230'
	Type of Date/Publication Status	'c' - Continuing resource currently published
	Date1/Beginning Date of Publication	'1993'
	Date2/Ending Date of Publication	'9999'
	Place of Publication, Production, or Execution Code	'mdu' - Maryland
	Frequency	'b' - Bimonthly
	Regularity	'r' - Regular
	Type of Continuing Resource	'p' - Periodical
	Form of Original Item	' ' - None of the following
	Form of Item	' ' - None of the following
	Nature of Entire Work	' ' - No specified nature of entire work
	Nature of Contents	' '
	Government Publication	' ' - Not a government publication
	Conference Publication	'0' - Not a conference publication
	Original Alphabet or Script of Title	'a' - Basic Roman
	Entry Convention	'0' - Successive entry
	Language Code	'eng' - English
	Modified Record	' ' - Record is not modified
	Cataloging Source Code	'c' - Cooperative cataloging program

010 sn 92006834

040 NSD **$b** eng **$c** NSD **$d** CAS **$d** NST **$d** WAU **$d** EYM **$d** NLM **$d** HUL **$d** SYS **$d** OCLCQ **$d** PIT **$d** NSD **$d** OCLCQ **$d** CLU **$d** ITD **$d** OCLCQ **$d** AU@ **$d** UKMGB **$d** OCLCQ **$d** OCLCO **$d** OCLCQ **$d** OCLCF **$d** OCLCO **$d** OCLCA **$d** DLC **$d** OCLCA **$d** OCLCQ **$d** O CLCL **$d** OCLCQ

012 **$i** 9304 **$j** 0 **$k** 1 **$l** 1 **$m** 1

016 7 9308427 **$2** DNLM

016 7 SR0076946 **$2** DNLM

016 7 012433868 **$2** Uk

016 7 012116839 **$2** Uk

019 221526201 **$a** 995484954 **$a** 1053978593 **$a** 1063456326 **$a** 1089787521

022 0 1067-2516 **$2** j

023 0 1067-2516 **$2** j

030 JFSUEI

032 922540 **$b** USPS

037 **$b** Williams & Wilkins, 428 E. Preston St., Baltimore, MD 21202

042 nsdp **$a** pcc
050 4 RD560
060 0 0 W1 **$b** JO652S
082 1 0 617 **$2** 12 **$1** https://id.oclc.org/worldcat/ddc/E3YM8MMTVgYPgDmxF4cHh8XGcP
210 0 J. foot ankle surg.
222 4 The Journal of foot and ankle surgery
245 0 4 The Journal of foot and ankle surgery.
260 Baltimore, MD : **$b** Williams & Wilkins, **$c** ©1993-
300 volumes : **$b** illustrations ; **$c** 28 cm
310 Bimonthly
336 text **$b** txt **$2** rdacontent
337 unmediated **$b** n **$2** rdamedia
338 volume **$b** nc **$2** rdacarrier
362 0 Vol. 32, no. 1 (Jan./Feb. 1993)-
500 Title from cover.
500 Published: Baltimore, MD : Data Trace Pub., <1998->
530 Also issued in online version.
550 "Official journal of the American College of Foot and Ankle Surgeons."
650 0 Ankle **$x** Surgery **$v** Periodicals.
650 0 Foot **$x** Surgery **$v** Periodicals.
650 2 Ankle **$x** surgery.
650 2 Foot **$x** surgery.
650 7 Ankle **$x** Surgery. **$2** fast **$0** (OCoLC)fst00809686
650 7 Foot **$x** Surgery. **$2** fast **$0** (OCoLC)fst00931326
655 2 Periodical.
655 7 Periodicals. **$2** fast **$0** (OCoLC)fst01411641
710 2 American College of Foot and Ankle Surgeons. **$1** https://id.oclc.org/worldcat/entity/E39QH7JmqhfHftRmw3VbPc3FhR
776 1 **$t** Journal of foot and ankle surgery (Online) **$x** 1542-2224 **$w** (DLC) 2002213269 **$w** (OCoLC)50849610
780 0 0 **$t** Journal of foot surgery **$x** 0449-2544 **$w** (DLC)sn 79006255 **$w** (OCoLC)3711674
850 DNLM **$a** MiU **$a** MoSW-M **$a** WaU
856 4 1 **$u** http://www.sciencedirect.com/science/journal/10672516
856 4 1 **$u** http://www.jfas.org
891 3 3 **$9** 853 **$8** 1 **$a** v. **$b** no. **$u** 06 **$v** r **$i** (year) **$j** (month/month) **$w** b **$x** 01
891 4 0 **$9** 863 **$8** 1 **$a** <33> **$i** <1994> **$x** provisional
029 1 AU@ **$b** 000009838820
029 1 AU@ **$b** 000023036808
029 1 AU@ **$b** 000053142085
029 1 NLGGC **$b** 106063979
029 1 NLM **$b** 9308427
029 1 NZ1 **$b** 3847676
029 1 ZWZ **$b** 04030227X
029 1 UKMGB **$b** 012116839