Di yi jun yi da xue bao = Academic journal c
DUP - General Collection
W1 T11001J
v. 25, no. 7
July 2005

Index Medicus (IM) Reference
(CA) Reference
(AJ) Reference

ISSN 1000-2588
CODEN DJUXEX

Core Journal of Comprehensive Medicine and Health in China

Statistical Source Journal of Chinese Scientific and Technological Articles

Journal of Core Database Source of China Science Citation Databases

Source journal of Comprehensive Evaluation Database of Chinese Academic Journals

# DI-YI JUNYI DAXUE XUE BAO

## Journal of First Military Medical University

Journal of First Military Medical University

Vol. 25 No. 7 Vol. 25, No. 7

7

2005

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**Shock research in China attracted international attention**

Professor Zhao Kesen was invited to give a speech at the International Conference on Rheology

At the “12th International Conference on Biorheology and the 5th International Conference on Clinical Hemorheology”, which was ended on June 2 in Chongqing, Professor Zhao Kesen, a Chinese representative, gave an academic report on “Hemorheological Events in Severe Shock”, which caused a great sensation among hundreds of international and domestic representatives participating in the conference.

In this report, a large number of data, images, and recordings were used to explain that the reason for the difficulty in restoring microcirculation low perfusion flow in severe shock is due to the blockage of capillaries by white blood cells, which makes it difficult for drugs to reach the already blocked capillaries and exert their effects. Restoring the reduced pulse pressure and pulsating blood flow during shock can flush out the white blood cells that have been blocked, restoring capillary perfusion. The traditional Chinese medicine polydatin plays the aforementioned role. When investigating the mechanism of shock induced intractable hypotension, it was found that the activation of potassium ion channels in the vascular smooth muscle, which leads to hyperpolarization of the cell membrane, is an important reason for the decreased response of blood vessels to contractile drugs. Potassium channel antagonists can restore vascular reactivity, and vasopressors can be used to treat intractable hypotension in shock, and as a result, he was the first to publish an article on “A New Approach to Use of Vascular Reactive Restorers in the Treatment of Severe Shock” in the internationally renowned journal “Shock”. After giving the report, several members of the National Academy of Sciences and Engineering, as well as several scholars, congratulated Professor Zhao. The President of the Conference, Professor Qian Xu, a member of the National Academy of Sciences and Engineering, held Professor Zhao's hands and said, “Your work was well done, and the report is also good.” Smith Shanbai, an academician of the National Academy of Engineering expressed sincere congratulations and cited Professor Zhao's work eight times in the subsequent conference reports.

Zhao Kesen is a doctoral supervisor of the Department of Pathology and Physiology at Guangzhou Southern Medical University (formerly the First Military Medical University) and one of the founders of the International Federation of Shock Societies (IFSS). Professor Zhao graduated from Harbin Medical University in 1959 and studied at the University of California, San Diego, USA, under the guidance of Professor Zweifach, the father of microcirculation. He is currently a member of the Academic Degrees Committee of the State Council, the Chairman of the Shock Professional Committee of the Chinese Society of Pathology and Physiology, a member of the International Federation of Shock Societies, and a member of the Asian Microcirculatory Alliance. He established China's first shock microcirculation key laboratory and trained a group of outstanding masters and doctoral talents, including Chief Scientists of the State Program 973 and winners of the National Outstanding Talent Foundation. He’s even won honorary titles such as Outstanding Instructor in Military Academies and First Generation Scientific and Technological Master in the General Logistics Department.

Extracted from *Science and Technology Daily*, June 10, 2005

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**Editor in Chief:** WANG Zheng-ai
**Executive Editor:** DUAN Yong-hui
**English Editors:** SONG Jian-wu, CHEN Wang-zhong
**Executive Technical Editor:** WEN Cai-hong
**Executive Proofreader:** CHEN Wang-zhong
**Basic parameters of this journal:** CN44-1152/R*1981*m* A4*160*zh+en*P*¥10:00*1500*55 *2005-7

**Journal of First Military Medical University**
**Volume 25 Number 7 July 2005**
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**Executive Editor:** DUAN Yong-hui
**English Editors:** SONG Jian-wu, CHEN Wang-zhong
**Executive Technical Editor:** WEN Cai-hong
**Executive Proofreader:** CHEN Wang-zhong

# Use of suture-free zipper in thyroid surgery

Hou Yizhao (Pinghai Center Health Center, Huidong County, Guangdong Province, Guangdong 516363 China)

**Abstract: Objective** To introduce a new non-invasive method for closing the thyroid surgical incision. **Method** A 12 cm long MEDISIP skin suture-free zipper manufactured by ATRAX was used to close the thyroid surgical incision, and its effect was observed. **Result** Fifteen patients underwent this method to close the surgical incision, all without infection, achieving beautiful wound healing, with small scars, and ideal results. **Conclusion** The suture-free zipper method is worth promoting and using in the suturing of thyroid surgical incisions.

**Keywords:** Thyroid gland; Surgical incision; Seam-free zipper

**Chinese Library Classification Number:** R653 **Document Code:** B **Article No.:** 1000-2588(2005)07-Inside Back Cover-01

In order to solve the issue of scars left by conventional silk suture incisions, especially due to factors such as delicate and exposed skin on the neck and face, rich blood circulation, and increased activity, the treatment of surgical wounds on the neck and face can have issues regarding cosmetic effects [1]. It is essential that there are no obvious scars left on the face after surgery, and the dots and lines should be coordinated. Therefore, from October 2001 to May 2004, a clinical study was conducted in our hospital on the non-invasive closure effect of thyroid surgical incisions using the new technique of suture-free zippers, and ideal results were achieved. Now a report is given as follows:

## 1 Data and methods

1.1 Clinical data

Fifteen patients underwent thyroid surgery, including 5 males and 10 females, aged between 20 and 60 years old. Two patients were diagnosed with primary hyperthyroidism and 13 patients with thyroid adenoma, with a disease course of 3 to 5 years.

1.2 Materials

The suture-free zipper was a MEDISIP skin suture-free zipper manufactured by Shanghai ATRAX, in Lot No. 041103, with a length of 12 cm. It is mainly used for closing surgical incisions, and has the advantages of convenient use, tight closure of incision, small postoperative scar, toxicity free, and no adverse reactions such as allergies.

1.3 Methods

After the thyroid surgery was completed and the subcutaneous tissues were sutured, the area around the incision was disinfected using 75% alcohol, and the skin to be bonded was flattened with gauze. The bottom of the zipper was folded outward in half, the uneven adhesive paper was removed from one side of the zipper, and the zipper was glued flat to the skin, so that the zipper teeth on this side was 0.5 cm from the edge of the incision. The zipper ends should be kept about 1-12 cm longer than the two ends of the incision. The other end of the zipper was bonded in the same way. The toothed forceps were used to align the incision edges while the other surgeon pulled the zipper together.

1.4 Efficacy observations

The closure time, postoperative incision infection rate, average hospital stay, and incision scar formation were observed as the indicators of efficacy.

## 2 Results

Among the 15 patients undergoing thyroid surgery, there was no postoperative incision infection or incision dehiscence. The average time to close the incision was 2.5 minutes, and the average hospital stay was 4 days. In the follow-up at 4 weeks after the surgery, the incision scars were small.

2.1 Typical cases

Patient 1, a male aged at 35 years old born in Pinghai, Huidong, was admitted to our hospital on December 13, 2001 with a left anterior cervical mass as the chief complaint for half a year. Half a year ago, the patient unintentionally discovered a red jujube-sized mass on the left anterior cervical area, with no pain and no sweat, with symptoms as palpitation, weakness, irritation, excessive eating, and easy hunger. The symptoms were not managed. For half a year, the tumor slightly increased, and the patient came to our hospital for ultrasonic B and thyroid function examination, which showed a left thyroid adenoma and ruled out hyperthyroidism.

Patient 2, a female aged at 21 years old born in Pinghai, Huidong, was admitted to our hospital in July 2003 due to the finding of an anterior cervical mass for half a month as the chief complaint. Before admission, the patient underwent ultrasonic B, electrocardiogram, chest X-ray, and thyroid function examination in another hospital, which showed a right thyroid cystadenoma, and ruled out other diseases such as hyperthyroidism.

The two typical patients mentioned above underwent adenoidectomy under cervical plexus anesthesia on the second day after admission, and the surgical process was smooth. ATRAX's 12 cm MEDISIP skincare suture-free zipper was used to close the incision. The incision healed well after the operation. The patients were discharged on the 4th day after surgery. The patients were followed up at 4 weeks and 1 year after the surgery, which showed that the incision scar was small, beautiful, and flat, with no tension.

## 3 Discussion

For many years, conventional silk suture has been used as the main method for intermittent suturing of the entire skin layer in surgical incision. However, there are disadvantages such as poor skin alignment, serious suture reaction, the need to remove the suture after surgery, large scar on the incision, and impact on aesthetics. There are reports [2, 3] that ZT mastic has achieved good results in clinical medical applications such as cosmetic surgery and the treatment of pediatric inguinal hernia. Therefore, based on the inspiration from ZT mastic, we investigated the clinical use of MEDISIP suture-free zipper instead of conventional surgery using silk suture to close the incision, to study its promotion and use in thyroid surgical incision suturing, and observe the clinical efficacy in 15 patients, achieving satisfactory clinical results, which was highly favored by doctors and patients. Our experience in clinical use is that: This method is simpler to operate, saves time, and has more obvious advantages compared to the conventional intermittent suture of full layer of skin using silk suture when the incision is longer. As it was only in contact with the surface of the skin and there was no stimulation from foreign objects caused by suture within the skin, it was easy to use and had no adverse reactions such as no toxicity. Moreover, the skin margin was tightly aligned and the gap was small, so the scar after the incision healing was not obvious, and it was especially suitable for cosmetic surgery. In addition, it was not required to remove the suture and change the dressing for the incision, which shortened the patient's hospital stay and improved the patient compliance. In the process of use, we hold that there are the following valuable experiences to learn from: ① It is better to use a straight incision, with a curvature of no more than 15 degrees; ② The length of the zipper should be 1-2 cm longer than both ends of the incision; ③ The distance between the teeth of the zipper on both sides and the edge of the incision is 0.5 cm to avoid causing the incision to flip inward or outward; ④ When suturing subcutaneous tissues, it is necessary to maintain the incision on both sides on the same plane. If the above points can be well noted and handled during surgery, the clinical effect will be more ideal.

**Received on:** May 6, 2005

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(Editor in charge: Chen Wangzhong)

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| **Journal of First Military Medical University** | | **Journal of First Military Medical University** |
|---|---|---|
| **July 2005 Volume 25 Number 7** | | **July 2005 Volume 25 Number 7** |
| **Monthly, Founded in 1981** | | **Monthly, Founded in 1981** |
| **Sponsored by:** | First Military Medical University | **Sponsored by** First Military Medical University |
| **Edited and published by:** | Editorial Department of Journal of First Military Medical University, Guangzhou 510515 China | **Edited and published by** Editorial Department of Journal of First Military Medical University |
| **Tel.:** | (020)61648175 | **Tel.:** (020)61648175 |
| **Fax:** | (020)61648176 | **Fax**: (020)61648176 |
| **Website:** | www.jfmmu.com | **Http**://www.jfmmu.com |
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| **Editor-in-chief:** | LI Kang | **Chief Editor:** LI Kang |
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| **Printed by:** | Huashan Printing Factory | **Printed by** Huashan Printing Factory |
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| **Domestic Subscription:** | Local Post Offices | Domestic: Local Post Offices |
| **Foreign Subscription:** | China National Publications Export Trading Corporation (P.O. Box. 782, Beijing, China) | Foreign: China National Publications Export Trading Corporation (P.O. Box. 782, Beijing, China) |
| **China Periodical Register Number:** | CN44-1152/R | **China Periodical Register Number:** CN44-1152/R |
| **Post Office Code Number:** | 46-10 | **Post Office Code Number:** 46-10 |
| **Domestic Subscription Rate:** | RMB 10.00 | **Foreign Subscription Rate:** USD 5.00 |
| **Publication Date:** | July 20, 2005 | **Publication Date:** July 20, 2005 |
| **Advertisement License:** | Sui Interim Advertisement Review (2000) No. 169 | |

# Nasal endoscopy combined with multiple radiofrequency for perennial allergic rhinitis

FANG Chao-xin, ZHEN Shao-shao (Department of Otorhinolaryngology, Central Hospital of Kaiping, Kaiping 529300, China)

**Abstract: Objective** To evaluate the therapeutic effects of nasal endoscopic surgery combined with multiple radiofrequency in the treatment of perennial allergic rhinitis. **Methods** Sixty-three patients with perennial allergic rhinitis whose symptoms failed to be controlled by medication received nasal endoscopic surgery for submucous resection of the nasal septum combined with radiofrequency ablation of the bilateral sphenopalatine foramen, anterior ethmoidal nerve, and inferior nasal concha. **Result** At 1 month after operation, the rate of excellent recovery was 92.1% (58/63), the efficacy rate was 7.9% (5/63), and the total efficacy rate was 100%. At 1 year after operation, the rate of excellent recovery was 88.9% (56/63), the efficacy rate was 7.9% (5/63), the rate of no efficacy was 3.2% (2/63), and the total efficacy rate was 96.8% (61/63). At 2 years after operation, the rate of excellent recovery was 82.6% (52/63), the efficacy rate was 12.7% (8/63), the rate of no efficacy was 4.8% (3/63), and the total efficacy rate was 95.2% (60/63). Compared with patients in the control group who underwent only nasal endoscopic surgery for submucous resection of the nasal septum, the total efficacy rate ($P < 0.01$ for excellent recovery + Efficacy) at 1 and 2 years after the surgery was significantly improved, with statistical significance. **Conclusion** Nasal endoscope combined with radio frequency may achieve good therapeutic effects on perennial allergic rhinitis with less adverse effects.

**Key words:** perennial allergic rhinitis; nasal endoscope; radiofrequency technique

**[Chinese Library Classification No.]** R765.11 **[Document Code]** A **[Article No.]** 1000-2588(2005)07-0876-02

## Nasal endoscopy combined with multiple radiofrequency for perennial allergic rhinitis

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**Abstract: Objective** To evaluate the therapeutic effects of nasal endoscopic surgery combined with multiple radiofrequency in the treatment of perennial allergic rhinitis. **Methods** Sixty-three patients with perennial allergic rhinitis whose symptoms failed to be controlled by medication received nasal endoscopic surgery for submucous resection of the nasal septum combined with radiofrequency ablation of the bilateral sphenopalatine foramen, anterior ethmoidal nerve, and inferior nasal concha. **Result** One month after operation, the rate of excellent recovery was 92.1% (58/63), efficacy rate of 7.9% (5/63), and total efficacy rate of 100%, which was 88.9% (56/63), 7.9% (5/63), and 96.8% (61/63) 1 year after operation, respectively, with 2 patients (3.2%) of the patients failed to respond to the treatment. Two years after the operation, the excellent rate, efficacy rate, and total effective rate was 82.6% (52/63), 12.7% (8/63), and 95.2% (60/63), respectively, with 3 patients failed to obtain good recovery. **Conclusion** Nasal endoscope combined with radio frequency may achieve good therapeutic effects on perennial allergic rhinitis with less adverse effects.

**Key words:** perennial allergic rhinitis; nasal endoscope; radiofrequency technique

There are many surgical treatments for perennial allergic rhinitis, but a single treatment method has a higher rate of long-term recurrence. From March 1998 to January 2003, various methods such as nasal endoscopic surgery for submucous resection of the nasal septum combined with radiofrequency ablation of the sphenopalatine foramen, anterior ethmoidal nerve, and inferior nasal concha were used in our department for the treatment of 63 patients with perennial allergic rhinitis. After some time, patients were followed up, and the results were good. Now a report is given as follows.

## 1 Data and Methods

### 1.1 Clinical data

Sixty-three patients were admitted to our hospital, including 41 males and 22 females, aged at 19-60 years, with an average age of 30.5 years and a disease course of 1-3 years. All the patients complied with the diagnostic criteria for perennial rhinitis [1], and were accompanied by deviated nasal septum. They all received systemic and local treatment with antihistamines and corticosteroids, but the efficacy was not satisfactory. The 63 patients were randomly selected as the treatment group according to the admission period, and another 20 patients with the same disease who underwent nasal septum surgery alone were selected as the control group. The patients in both groups were inpatients.

**Received on:** January 4, 2005
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### 1.2 Treatment methods

The patients in the treatment group were put in the supine position and treated with 2% dicaine and 1/1000 adrenaline cotton pad for surface anesthesia and contraction of the nasal mucosa. Under nasal endoscopy, the SHP-I five-organ radiofrequency therapy instrument (manufactured by Guangzhou Medical Instrument Factory) was firstly used, with the Level 3 intensity selected, and the firing head aligned with the sphenopalatine foramen on both sides, to carry out radiofrequency at the anterior upper part of the nasal septum on both sides (the radiofrequency points on both sides were staggered by 5 mm to prevent perforation of the nasal septum), and at the anterior upper part of the lateral wall of the nasal cavity, the nasal ridge, and the anterior part of the inferior nasal turbinate (for those with severe hypertrophy of the inferior turbinate, partial resection of the inferior turbinate was performed). It was advisable to have a white ring around the radiofrequency head. The anterior part of the inferior turbinate could undergo radiofrequency at 3-5 points, and the nasal ridge and lateral wall of the nasal cavity could be cut to the periosteum using a radiofrequency knife. Further submucosal resection of the nasal septum was performed, and uncinate process resection, sinus opening, lateral part resection of the middle turbinate or nasal polypectomy were performed for those who had hypertrophy of the uncinate process, sinusitis, hypertrophy or polypoid lesion of the middle turbinate, or nasal polyps. After the surgery, both nasal cavities were filled with expanded sponges, and the fillers were removed 48 hours later. For the patients in the control group, only submucosal resection of the nasal septum was performed.

### 1.3 Evaluation criteria for efficacy

The efficacy was evaluated according to the evaluation criteria for allergic rhinitis [1].

### 1.4 Statistical processing

The efficacy between the two groups was compared using the *t* test.

## 2 Results

Patients in the experimental group experienced worsening of nasal congestion and runny nose at 1-3 days after the surgery. On the 4th day, the symptoms were gradually relieved as the white pseudomembrane was cleared. After 3-4 weeks, the symptoms disappeared. No complications such as perforation of the nasal septum, decreased olfactory function, and dry nose and eyes were observed.

All the patients were followed up for 2 years, and no antihistamines or corticosteroids were used for treatment during the observation period.

One month after the surgery: The rate of excellent recovery was 92.1% (58/63), the efficacy rate was 7.9% (5/63), and the total efficacy rate was 100%; in the control group, the rate of excellent recovery was 40% (8/20), the efficacy rate was 50% (10/20), the rate of no efficacy was 10% (2/10), and the total efficacy rate was 90% (9/10).

One year after the surgery: The rate of excellent recovery was 88.9% (56/63), the efficacy rate was 7.9% (5/63), the rate of no efficacy was 3.2% (2/63), and the total efficacy rate was 96.8% (61/63); in the control group, the rate of excellent recovery was 30% (6/20), the efficacy rate was 40% (8/20), the rate of no efficacy was 30% (6/20), and the total efficacy rate was 70% (7/10).

Two years after the surgery: The rate of excellent recovery was 82.6% (52/63), the efficacy rate was 12.7% (8/63), the rate of no efficacy was 4.8% (3/63), and the total efficacy rate was 95.2% (60/63); in the control group, the rate of excellent recovery was 20% (4/20), the efficacy rate was 40% (8/20), the rate of no efficacy was 40% (8/20), and the total efficacy rate was 60% (6/10).

According to statistical analysis, there was a significant difference in the total efficacy rate between the two groups at 1 and 2 years after the surgery ($P < 0.01$).

**3 Discussion**

Numerous studies have shown that the parasympathetic nerves in the nasal cavity include the parasympathetic fibers of the pterygoid canal nerves and anterior ethmoidal nerves, independent cholinergic ganglia in the inferior turbinate mucosa, and some neurovascular peptides (vasoactive peptides and substance P) in the unmyelinated sensory nerve fiber endings of the nasal cavity, which regulate the vascular dilation and contraction of the nasal mucus membrane and the secretion of glands [2-4]. The treatment of perennial allergic rhinitis mainly relies on medication, but for cases with abnormal nasal structures, medication alone often has poor efficacy. Reasonable surgical interventions should be carried out based on the specific structural characteristics. Due to the complex innervation of the nasal mucosal nerves, radiofrequency technique was used to process multiple parts in the nasal cavity. In two cases, the radiofrequency ablation of sphenopalatine foramen was used to block the posterior parasympathetic fibers of the sphenopalatine nerve, and the medial and lateral branches of the anterior ethmoidal nerve were damaged by radiofrequency ablation of the anterior upper part of the nasal septum and the lateral wall of the nasal cavity [3, 5]. In addition, the inferior turbinate contains cholinergic nerves and their parasympathetic plexus [6], so 3-5 points were selected for radiofrequency ablation at the anterior part of the inferior turbinate.

The use of radiofrequency technique completely blocks the parasympathetic pathway of the nasal mucosa, reduces the vascular tension, reduces glandular secretion, and thus achieves the therapeutic purposes [7]. Pterygoid canal neurotomy alone or/and anterior ethmoidal neurotomy or inferior turbinate treatment preserves 1-2 parasympathetic pathways in the source and distribution of parasympathetic nerves in the nasal mucosa. However, due to the presence of allergic reaction arcs, the postoperative effect is poor and the recurrence rate is high [8, 9]. For the patients in this group, all the nasal mucosal parasympathetic pathways, including the posterior ganglionic fibers of the sphenopalatine nerve, the parasympathetic fibers of the anterior ethmoidal nerve, and the cholinergic ganglia within the inferior turbinate mucosa were blocked. The allergic reflex arc was completely relieved, thus achieving stable and reliable results.

In addition, after correcting the deviation of the nasal septum, the imbalance stimulation of bilateral nasal cavities is eliminated, the sensory-parasympathetic reflex is reduced, and the nasal ventilation and drainage are improved, which is beneficial for the benign prognosis of the disease. Through the joint action of multiple links, the therapeutic effect of perennial allergic rhinitis is significantly improved.

The case study of this experimental group has demonstrated the following advantages: (1) Accurate localization of the surgical area, especially the precise effect of nerve blockade, while avoiding accidental injury to the adjacent important tissues. (2) It is easy to identify and eliminate other nasal symptoms that affect the therapeutic effect, such as hypertrophy of the uncinate process, hypertrophy of the middle turbinate, polypoid lesion, sinusitis, nasal polyps, etc. (3) Radiofrequency therapy is the use of high-frequency electromagnetic waves to coagulate and denature tissue proteins. The temperature at the radiofrequency ablation site is low (60-80°C). Without the damage from high temperature to the surrounding tissues, it will not cause acute perforation of blood vessels and massive bleeding [10]. There is no carbonization, vaporization, or smoke generation, the surgical field is clear, and it is easy for continuous operation.

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# Research on Comprehensive Intervention for Population with Community Chronic Non-Communicable Diseases

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**Abstract: Objective** To control the risk factors of chronic non-communicable diseases in community population and reduce the incidence rate of chronic non-communicable diseases by implementing community-based comprehensive population intervention measures. **Method** Based on the baseline survey of community population health, a monitoring system is established for chronic non-communicable diseases, health education and promotion are promoted, and intensified intervention and drug intervention are implemented for high-risk populations and current patients. **Result** The lifestyle of the community population has been improved, with lower levels of hypertension and hyperglycemia, and a significant reduction in cardiovascular and cerebrovascular events. **Conclusion** Comprehensive intervention measures for community population are effective ways to control chronic non-communicable diseases in the community, and have a wide range of application prospects.

**Keywords:** Community; Chronic non-communicable diseases; Intervention

**Chinese Library Classification No.:** R184 **Document Code:** A **Article No.:** 1000-2588(2005)07-0878-02

Xiaohuangpu Community in Shunde District is located in the center of the Pearl River Delta, with a community area of 6.6 square kilometers and a population of 7,497. In 1999, a baseline health survey was conducted among middle-aged and above residents in the community, showing a high level of risk factors for various cardiovascular and cerebrovascular diseases among the residents [1]. Chronic non-communicable diseases, mainly cardiovascular and cerebrovascular diseases, have become major diseases threatening the health and life of the residents. In this study, graded interventions on chronic non-communicable diseases were conducted among the community residents from 2001 to 2004, for the purpose of evaluating the effects of implementing disease intervention and control measures in the community in preventing and treating chronic non-communicable diseases.

## 1 Subjects and Methods

1.1 Subjects

Residents who have resided in Xiaohuangpu Community for more than 5 years and are over 35 years old.

1.2 Research methods

1.2.1 *Improve the organizational structure and establish a monitoring system* Led by the town government, assisted by the neighborhood committee, the town hospital and Xiaohuangpu community health service station jointly formed a community health service leading team and working team, and formulated the relevant policy documents to promote the implementation of the work. A community computer information monitoring system for chronic non-communicable diseases was established, and the various chronic non-communicable diseases were filed separately for easy tracking and follow-up.

1.2.2 *Population survey* In 2001, a baseline survey on the health of the entire population was conducted, and on this basis, a 3-year community intervention and control program for chronic non-communicable diseases was carried out. In 2004, an outcome survey was conducted, and the general information on the survey subjects was provided (Table 1). The survey content included a questionnaire on medical history and lifestyle, blood pressure, height, weight, chest circumference, hip circumference, blood lipid and blood sugar, electrocardiogram, chest X-ray, and examinations of surgery and medicine to screen chronic non-communicable diseases and related risk factors, and carry out comparison before and after intervention. At the same time, personal and family health records were established. Its quality control was guided by experts from the Department of Epidemiology, Institute of Cardiovascular Diseases, Guangdong Provincial People's Hospital, who participated in the investigation. The quality control and data entry personnel received pre-investigation training and assessment.

**Table 1. General information of community survey subjects**

| | Population at baseline | Population at outcome | Follow-up rate (%) |
|---|---|---|---|
| Male | 1,676 | 1,378 | 82.2 |
| Female | 2,407 | 2,133 | 88.6 |
| Total | 4,083 | 3,511 | 85.9 |

1.2.3 *Personnel training* The relevant personnel of the town hospital and the medical staff of the Xiaohuangpu community health service station received strengthened training, developed into general practitioners and community medical professionals, to establish a team that mastered the investigation, monitoring, and intervention methods of chronic non-communicable diseases.

1.3 Intervention methods

1.3.1 *Health education* Health education and health promotion were carried out for the whole population, and board newspapers, leaflets, health lectures, health hotlines, hypertension and diabetes homes and other forms of education were used to guide the change from unhealthy lifestyles.

1.3.2 *Intensive intervention for risk factors in high-risk populations* Individuals with a blood pressure level between SBP of 130-139 mmHg and/or DBP of 85-89 mmHg, family history of positive coronary heart disease, stroke, hypertension, body mass index (BMI) > 25, excessive alcohol consumption, smoking habits, fasting blood glucose levels between 6-7 mmol/L, and dyslipidemia were required to quit smoking and limit alcohol consumption, have a reasonable dietary structure, such as limiting salt and sugar, reducing fat and calorie intake, and engage in regular aerobic exercise, such as walking, shadow boxing, jogging, weight loss, etc.

1.3.3 *Control and management of current patients* Conventional drug intervention were carried out for individuals with hypertension (SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg) [2], diabetes (FBS ≥ 7.0 mmol/L and/or postprandial blood glucose ≥ 11.1 mmol/L) [3] and abnormal blood lipids (TC ≥ 5.72 mmol/L and/or TG ≥ 1.70 mmol/L and/or LDL-C ≥ 3.64 mmol/L and/or HDL-C ≤ 0.91 mmol/L) [4], those who failed to reach the standard after doing exercises and controlling diet, and patients with coronary heart disease and stroke, unless drug intervention was used, and antihypertensive, hypoglycemic, lipid-lowering, anticoagulant, and vasodilator drugs were selected according to different situations, and regular follow-up was carried out

**Received on:** March 11, 2005

**Fund Project:** Supported by Guangdong Provincial Medical Research Foundation (A2001856)

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once every 1-3 months.

1.4 Statistical Analysis

The SPSS 11.5 statistical software by Windows was used for data processing.

**2 Results**

After the interventions, the community residents changed their unhealthy behaviors and shifted towards a healthy lifestyle. The rate of behaviors such as regular exercise was increased, and the rate of compliance with medication advice was increased (Table 2), which was significantly higher than those before the interventions ($P < 0.05$). However, smoking, drinking alcohol, and overweight had no significant difference before and after the interventions ($P < 0.05$). The intake of salt and edible oil was decreased, and the intake of fat and fewer calories was somewhat decreased.

**Table 2. Changes of risk factors and lifestyle among the residents (%)**

| Item | Baseline | | Outcome | |
|---|---|---|---|---|
| | Male (%) | Female (%) | Male (%) | Female (%) |
| Smoking | 58.4 | 4.7 | 55.8* | 4.1* |
| Alcohol intake | 66.1 | 16.2 | 65.3* | 15.8* |
| Overweight | 20.8 | 21.4 | 17.6* | 19.7* |
| Dyslipidemia | 49.6 | 35.7 | 36.2** | 19.6** |
| Hypertension | 20.1 | 11.5 | 15.9** | 6.2** |
| Hyperglycemia | 5.3 | 5.8 | 2.8** | 2.1** |
| High salt diet | 52.7 | 50.3 | 46.3** | 41.8** |
| Regular exercise | 8.7 | 38.6 | 26.1** | 46.4** |
| Medication on time | 38.2 | 49.7 | 59.3** | 72.4** |

With the baseline compared to the outcome, * $P > 0.05$, ** $P < 0.05$

After intervention, there was a significant decrease in hypertension, high blood sugar levels, and abnormal blood lipid levels in women, and there was a significant difference compared to those before intervention ($P < 0.05$), while there was no significant difference in abnormal blood lipid levels in men before and after intervention ($P > 0.05$). A monitoring system for cardiovascular and cerebrovascular disease incidences and deaths was established and put into routine operation. According to the monitored results, from 2001 to 2004, the incidence of cardiovascular and cerebrovascular events such as myocardial infarction, angina pectoris, and stroke showed a decreasing trend, and the mortality rate was decreased (Figure 1).

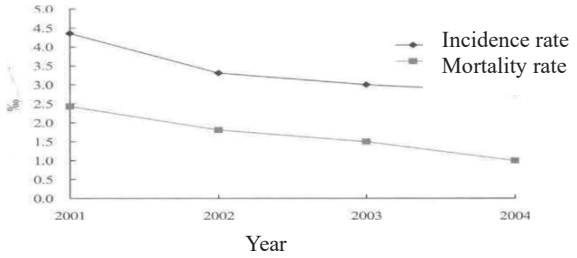


**Figure 1. Monitored results of incidence and death of community cardiovascular and cerebrovascular events**

**3 Discussion**

In the 1990s, deaths from cardiovascular diseases accounted for about one-third of the total mortality rate in China. According to the forecast by the World Health Organization, non-communicable diseases will account for 79% of the causes of death in China by 2020, with cardiovascular and cerebrovascular diseases ranking in the first place[1].

Community intervention is a huge social project, and comprehensive intervention for populations with chronic non-communicable diseases through the community first relies on the improvement of the organizational structures. This community is led by the government, with the participation of the relevant units and departments, assisted by the Xiaohuangpu neighborhood committee, and with the town hospital as the main force. The Xiaohuangpu community health service station specifically executes various tasks, and leaders and staff of the relevant departments form leading and working teams. A specialized office is established within the town hospital to formulate the relevant policy documents and implementation plans, forming a supportive implementation environment and management model related to the intervention and control of chronic non-communicable diseases. The baseline survey of community residents' health is the basis. In the past three years, systematic community intervention has been carried out in Xiaohuangpu Community, and patients have mastered 72.0% of the relevant knowledge about hypertension, diabetes, coronary heart disease and stroke. The disease management rate reached 69.0%.

The results of this study show that community intervention for chronic non-communicable diseases is effective and cannot be replaced with other methods. Some cities in China, such as Beijing and Tianjin, have also achieved good results in reducing the incidence rate and mortality after carrying out hierarchical management of population risk factors and chronic non-communicable diseases as well as treatment supervision for patients in urban sub-districts [5, 6]. This study also supports the above results. In addition, a health network management system covering the entire community plays an important role in disease intervention and control for the residents.

The intervention of chronic non-communicable diseases is a challenging systematic project that requires the joint support of individuals, families, governments, health departments, and various sectors of society. The implementation of this project shows that community intervention and control of chronic non-communicable diseases is an effective approach. As an intervention project, it is still difficult to observe many effects within 3 years, which requires finding more sensitive indicators for evaluation. In addition, how to ensure the long-term and sustainable intervention of chronic non-communicable diseases is also a challenging and long-term task.

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(Editor in charge: Wu Jinya)

# Value of Low Anastomosis with Bracing and Binding Method in Anus-preserving Surgery for Low Rectal Cancer

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**Abstract: Objective** To evaluate the value of low anastomosis with bracing and binding method in anus-preserving surgery for low rectal cancer. **Method** 629 cases were selected from 929 cases of low rectal cancer for anus-preserving surgery. The surgical methods included double stapler anastomosis ($n$ = 101) and transanal colon-rectum bracing and binding (anal) anastomosis ($n$ = 528). Surgical resection scope: Same as Miles surgery, except for the residual anal rectum (anal), levator ani muscle, anal medial and lateral sphincter, adipose tissue of the ischiocecal fossa, and perianal skin. **Result** The anus-preserving rate of low rectal cancer was 67.69%. After the radical surgery, 584 cases were followed up for more than 5 years. Five-year survival rate: 75% in the stapler group and 76.59% in the bracing and binding group. Local recurrence rate: 5% in the stapler group and 3.2% in the bracing and binding group. Surgical complications: 4% of anastomotic leakage in the stapler group; 2.5% of anastomotic leakage in the bracing and binding group. There was no significant difference in the 5-year survival, local recurrence rate, and postoperative complications between the two anus-preserving methods ($P > 0.05$). **Conclusion** In low rectal cancer, those for whom the incisional colon-rectal (anal) anastomosis could be achieved while ensuring radical resection and postoperative defecation function can be selected as indications for anus-preservation. The choice of anus-preserving surgery is to use stapler technique if the anastomosis is in the pelvic cavity, and to use the bracing and binding anastomosis if the anastomosis is from the upper edge of the puborectal muscle to the intermuscular sulcus. Transanal bracing and binding anastomosis can replace stapling to complete ultra-low and colon-rectal (anal) anastomosis, and there is no difference in the prognosis of patients between the two anastomosis methods.

**Keywords:** Rectal cancer; Low; Anus-preserving; Surgery

**Chinese Library Classification No.:** **Document Code: A** **Article No.: 1000-2588(2005)07-0880-02**

Rectal cancer is one of the common malignant tumors, ranking in the fourth position in the incidence rate of malignant tumors in China. More than 70% of rectal cancers are low rectal cancers (below the peritoneal reflexion) [1]. In recent years, due to the promotion and use of double stapler technique (DST), the rate of anus-preserving surgery for low rectal cancer has been increased, and the range of indications for anus-preserving surgery for rectal cancer has been widened. How to reasonably choose the surgical indications for preserving the anus in low rectal cancer and choose the best reconstruction method is an issue worth investigation. The following report is given based on our experience and methods of preserving the anus in low rectal cancer.

## 1 Clinical data

### 1.1 General data

From February 1992 to May 2005, 929 cases of low rectal cancer were surgically treated, and 629 cases were selected for anus-preserving surgery. There were 332 males and 296 females, aged at 54 ± 4.8 (16-84) years old. Among them, 204 cases had a distance of 4 cm from the lower edge of the tumor to the anal edge, 107 cases had a distance of 4-6 cm, and 90 cases had a distance of 6-8 cm. Among them, 528 cases of anus-preserving surgery underwent the bracing and binding method and 101 cases of anus-preserving surgery underwent the double stapler technique. There was no statistically significant difference in gender, age, tumor location, pathological type, and Dukes staging between the two groups.

### 1.2 Clinical pathological data

In terms of the general types, there were 107 cases of raised type, 78 cases of discoid type, 352 cases of localized ulcer type, 76 cases of infiltrative ulcer type, and 6 cases of diffused infiltrative type; Histological classification: There were 52 cases of papillary adenocarcinoma, 196 cases of well differentiated adenocarcinoma, 319 cases of moderately differentiated adenocarcinoma, 33 cases of poorly differentiated adenocarcinoma, and 19 cases of mucinous carcinoma. Modified Dukes staging in China [2]: There were 8 cases of Stage A0, 30 cases of Stage A1, 194 cases of Stage A2, 56 cases of Stage B1, 92 cases of Stage C1, 96 cases of Stage C2, and 9 cases of Stage D3.

### 1.3 Scope of excision for anus-preserving surgery

On the basis of total mesorectal excision (TME), upper and lateral lymph node dissection and soft tissue resection were performed to the same extent as that of Miles surgery. Resection of the proximal intestinal tract and mesentery 15 cm above the upper edge of the tumor, as well as 1-5 cm at the distal end of the tumor was carried out. During the surgery, lateral lymph node dissection was performed for those who were diagnosed with pararectal lymph node metastasis, tumor occupation of the intestinal cavity for ≥ 1/2 circumference, or invasion of the lateral rectal ligament. The anal rectal canal, levator ani muscle, medial and lateral anal sphincter, adipose tissue of the ischiorectal fossa, and perianal skin were preserved. In some cases, the medial sphincter was removed and the lateral sphincter was preserved (i.e., the Bacon technique). There were 12 cases of combined left hemihepatectomy, 6 cases of right hemihepatectomy, and 18 cases of combined posterior uterovaginal wall hysterectomy (posterior pelvic dissection).

### 1.4 Colorectal (anal) anastomosis method

For the anastomosis method, the bracing and binding method and the double stapler technique were used. The tumor and rectal canal were fully freed, a pair of right angle forceps was placed at a distance of 1-5 cm from the lower edge of the tumor, and the anal canal and rectal cavity were disinfected and rinsed using 2% LIRCON cotton balls. Bracing and binding method: Transanal bracing and binding anastomosis method: Cut off the proximal colon at a distance of 15 cm from the upper edge of the tumor, place the sponge sac bracing anastomosis tube about 8 cm inside the opening of the side of the colon, bind with a double #7 silk suture, and fix with a single #7 silk suture. Cut off the distal rectum at the lower edge of the right-angle forceps, fully expand the anus, and suture the entire layer with #2 intestinal suture at a distance of 0.5-1.0 cm from the rectal or anal canal end in a loop using the purse-string technique. The anus was braced with the anastomosis tube and the opening of the side of the colon was protruded through the pelvic anal canal, making the suture and ligation relatively attached, sutured, and fixed to support the anastomosis tube. At about 10 days after the surgery, the anal bracing anastomosis tube fell off. Double stapler anastomosis technique: The stapler was nailed into the anal side, and purse-string suturing was carried out for the side opening with a purse-string suturing device. The diameter of the stapler was 33-35 mm, and the anastomosis was completed with the stapler.

### 1.5 Follow-up and statistical methods

The 5-year survival rate was calculated using the life table method. The 629 patients in the bracing and binding group were followed up for 3-150 months, among whom 44 were not available for follow-up, with a follow-up rate of 93.0%. All the data were analyzed using the SPSS 12.0 statistical software package. The $t$ test was used for mean comparison, the $x^2$ test was used for numeration data, the survival rate was calculated using the life table method, and the log rank test was used for survival curve comparison.

## 2 Results

**Received on:** April 19, 2005

The anus-preserving rate of low rectal cancer in this study was 67.6%, with 2 deaths in the surgery, including 1 case of death due to lung infection and 1 case of death due to heart failure. Anus-preserving surgery for low rectal cancer was completed in 518 cases using a bracing anastomosis tube, with the anastomotic plane below the dentate line in 55 cases, at 0-2 cm above the dentate line in 372 cases, and at over 2 cm above the dentate line in 91 cases. Double staplers were used to complete the anastomosis in 100 cases, with the anastomosis plane at 0-2 cm above the dentate line in 72 cases and at over 2 cm in 28 cases.

Surgical complications: Anastomotic leakage occurred in 4% of the patients in the stapler group, and anastomotic leakage occurred in 2.5% of the patients in the bracing and binding group. The 5-year survival rate was calculated using the life table method: 75% in the stapler group and 76.5% in the bracing and binding group; Local recurrence rate: 5% in the stapler group and 3.2% in the bracing and binding group. There was no significant difference in the 5-year survival rate, local recurrence rate, and surgical complications between the two groups ($P > 0.05$).

**3 Discussion**

3.1 Selection of indications for anus-preserving surgery for low rectal cancer

It is feasible to actively implement anus-preserving surgery for low rectal cancer on the premise of ensuring radical treatment [3]. The pathological type, depth of infiltration, distance from the dentate line, and pelvic lymph node metastasis are objective indicators that determine the indications for anus-preserving surgery. The degree of obesity, muscle strength, pelvic width, residual rectal length, and anastomosis level of patients are factors that affect the completion of anus-preserving surgery.

On the premise of not affecting radical surgery, combined with the technical level of the surgeon and considering the patient's postoperative quality of life, the indications for anus-preserving surgery are selected. In low rectal cancer, ensuring no infiltration of cancer cells at the lower incisal margin, no possibility of recurrence in the pelvic soft tissues or lymph nodes, maintaining the integrity of partial anal and rectal rings, and having good postoperative defecation function can be absolute indications for anus-preserving surgery. After anus-preserving surgery for rectal cancer, follow-up treatment should be strengthened, with regular follow-up of blood CEA, digital rectal examination, pelvic CT, MRI, and attention to the presence of anastomoses, pelvic lymph nodes, soft tissue recurrence, and liver metastasis. After comparing the postoperative results in this study, there was no statistically significant difference in the 5-year survival rate and local recurrence rate between the absolute anus-preserving group and the relative anus-preserving group.

3.2 Selection of surgical procedures for anus-preserving

There are many methods for preserving the anus in rectal cancer, and in addition to transabdominal resection and anastomosis, there is transabdominal and anal, transabdominal and vaginal, transabdominal and sacral, transabdominal and pubic, and transabdominal posterior resection and anastomosis. Regardless of the surgical procedure used, it is necessary to complete the incisional colon-rectal (anal) anastomosis. The selection of anastomosis methods should be simple, complete, economical, minimally invasive, in line with anatomical physiology, and easy to promote and master, with no postoperative complications.

The double stapler technique is one of the ideal methods, which widens the range of indications for anus-preserving surgery in low rectal cancer and can complete low and ultra-low anterior resection surgery (colon-rectal anal anastomosis within 2 cm from the dentate line). However, narrow pelvis, large tumor, and obesity often affect the completion of surgery. Sometimes it is difficult to complete the anastomosis from the upper edge of the puborectal muscle to the plane of the intermuscular sulcus using a double stapler, and the anastomosis plane for low rectal preserving surgery is often within this range. The anal bracing anastomosis tube can be used through the anal ring ligation colon-rectum (anal) method to complete the anastomosis from the upper edge of the puborectal muscle to any plane of the intermuscular sulcus, without being affected by the pelvic width, patient obesity, muscle strength, or rectal stump length. The bracing anastomosis tube has the function of anastomosis, dilation, hemostasis, drainage, and preventing anastomotic leakage, avoiding preventive transverse colostomy without residual anastomotic needles and sutures, resulting in early recovery of defecation function after the surgery. Bracing and binding anastomosis can solve the issue of ultra-low level anastomosis technique, which is simpler and easier to operate than staplers, and has a low incidence of anastomotic leakage.

3.3 Surgical treatment of low rectal cancer - radical and functional issues

Professor Yu Baoming [4] proposed that the success rate of anus-preserving surgery is currently a standard of measure of the quality of a of rectal surgeon. The 5-year survival rate in the data in this study demonstrates that different anastomosis methods have no significant difference in the prognosis of rectal cancer patients, provided that the anus-preserving surgery for low rectal cancer does not affect radical surgery.

The National Cancer Center Japan reported [5] that the anus-preserving rate for low rectal cancer was 51%. In this study, the anus-preserving rate was 67.6%, and the distance from the dentate line was 0-2 cm in 17.4%, 2-4 cm in 71.9%, and over 4 cm in 94.1%, respectively. It indicates that the distance between the lower edge of the tumor and the anal edge cannot be used as a single factor to determine whether to preserve the anus.

Regarding the length of the lower cutting edge of rectal cancer, we adhere to the principle of no cancer cell infiltration at the cutting edge and no peri-intestinal lymph node metastasis. The results demonstrate that the length of the lower cutting edge is not significantly related to the 5-year survival rate and the local recurrence rate. Patients who have penetration in the deep muscular layer of the intestinal wall should undergo total mesorectal excision. If the scope of pelvic soft tissue resection goes beyond the rectal stump, it should be removed in a "W" shape to prevent recurrence in the anastomotic site and surrounding soft tissues. If the rectal cancer invades the posterior wall of the uterus and vagina, and organ resection is feasible for radical treatment, anus-preserving surgery can be performed. For patients with simultaneous liver metastasis in the rectal cancer, the implementation of anus-preserving surgery is not influenced by the condition that local radical resection is feasible. Extended pelvic dissection on the side of low rectal cancer can effectively prevent metastasis to the lymph node. The postoperative defecation function is related to the length of the residual rectum. The puborectal muscle plays an important role in forming defecation and controlling defecation, and attention should be paid to repairing the puborectal muscle.

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