DECLARATION OF ROGER LOPEZ

I, Roger Lopez, pursuant to 28 U.S.C. § 1746 and 37 C.F.R. § 1.68, hereby declare as follows:

1. I am a Translator for Morningside Translations.

2. I submit this declaration to certify the accuracy of the English translation of Chen et al., *Radiofrequency treatment of nasal posterior-under nerve ethmoidal nerve and infraturbinal for perennial allergic rhinitis under nasal endoscope*, 11:3 China J. of Endoscopy 239 (Mar. 2005).

3. I am qualified to perform Chinese to English translations and certify the accuracy of Chinese to English translations.

4. My statements are based on personal knowledge and my review of Chen et al., *Clinical observation on radiofrequency ablation treatment in perennial allergic rhinitis*, 19:5 J. Clinical Otorhinolaryngol 214 (Mar. 2005) and its Chinese to English translation. If called as a witness about the facts contained in these statements, I could testify competently based on such personal knowledge and the investigation I have conducted.

5. Attached as **Exhibit A** is a true and accurate copy of Chen et al., *Radiofrequency treatment of nasal posterior-under nerve ethmoidal nerve and infraturbinal for perennial allergic rhinitis under nasal endoscope*, 11:3 China J. of Endoscopy 239 (Mar. 2005).

6. Attached as **Exhibit B** is a true and accurate copy of an English translation of Chen et al., *Radiofrequency treatment of nasal posterior-under nerve ethmoidal nerve and infraturbinal for perennial allergic rhinitis under nasal endoscope*, 11:3 China J. of Endoscopy 239 (Mar. 2005) (hereinafter, "Chen Translation"), which I prepared based on Exhibit A and my personal knowledge of the Chinese and English languages.

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7. Chen Translation is a true and accurate translation of Chen et al., *Radiofrequency treatment of nasal posterior-under nerve ethmoidal nerve and infraturbinal for perennial allergic rhinitis under nasal endoscope*, 11:3 China J. of Endoscopy 239 (Mar. 2005) from Chinese to English.

8. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true.

9. I have been warned and am aware that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

10. I understand that by submitting this declaration I may be asked to appear for a deposition asking me questions limited to the material in my declaration. With my signature below, I agree to make reasonable efforts to make myself available for such a deposition at a reasonable place and time.

* * *

I declare under the penalty of perjury that the foregoing is true and correct. Executed on December 7, 2023 in Missouri.

Roger Lopez

Roger Lopez

Exhibit A

文章编号： 1007-1989(2005)03-0239-02

·论著·

鼻内窥镜下射频热凝鼻后下神经、筛前神经及下鼻甲治疗常年性变应性鼻炎的初步探讨*

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摘要：目的 探讨提高治疗常年性变应性鼻炎(perennial allergic rhinitis, PAR)的新方法。**方法** 将常年性变应性鼻炎患者 80 例随机分为两组，观察组 40 例，接受鼻内窥镜下射频热凝鼻后下神经、筛前神经及下鼻甲治疗；对照组 40 例，接受鼻内窥镜下射频热凝蝶腭神经治疗。将两组中期疗效进行对比。**结果** 随访半年，观察组总有效率为 100.0%（其中显效 36 例），对照组为 67.5%（其中显效 10 例）。两组总有效率，经 χ^2 检验差异有显著性（$P<0.01$）。观察组无并发症发生，对照组出现术中出血 3 例。**结论** 经鼻内窥镜下射频热凝鼻后下神经、筛前神经及下鼻甲治疗 PAR 具有疗效显著、操作简便、无副作用等优点，有较好临床应用价值。

关键词： 常年性变应性鼻炎；鼻后下神经；蝶腭神经；筛前神经；射频
中图分类号： R765.213　　**文献标识码：** A

Radiofrequency treatment of nasal posterior-under nerve, ethmoidal nerve and infraturbinal for perennial allergic rhinitis under nasal endoscope*

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Abstract: 【**Objective**】To study a new method for perennial allergic rhinitis(PAR). 【**Methods**】80 cases of PAR randomly divided into 2 groups receive: observation group 40 cases treated with nasal posterior-under nerve, ethmoidal nerve and infraturbinal radiofrequency under nasal endoscope; control group 40 cases treated with sphenopalatine nerves radiofrequency under nasal endoscope. 【**Results**】All the cases were follow-up half year postoperatively, The total effective rate was 100% in observation group (excellent 90%)and 67.5% in control group (excellent 25%). There was significant difference ($P<0.01$) between the group in efficacy. The complicatiom was not observed in observation group and massive intraoperation hemorrhage ($n=3$) was observed in control group. 【**Conclusions**】The method that is treating PAR with nasal posterior-under nerve, ethmoidal nerve and infraturbinal radiofrequency under nasal endoscope is highly effective, easy to perform and few complications, so it is a good way to treat PAR.

Key words: perennial allergic rhinitis; nasal posterior-under nerve; sphenopalatine nerve; ethmoidal nerve; radiofrequency

鼻腔副交感神经兴奋性异常增高，在常年性变应性鼻炎（perennial allergic rhinitis, PAR）的发病过程中起重要作用。既往采用翼管神经切断术治疗 PAR，尽管远期有效率可达 76.0%[1]，但因创伤较大，且术后可出现眼干等并发症，故应用受到一定的限制。有鉴于此，我们对该术进行改进，于 2002 年 9

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月～2003年3月，应用经鼻内窥镜下射频热凝鼻后下神经、筛前神经及下鼻甲治疗PAR 40例（观察组），并与另一组经鼻内窥镜下单纯射频热凝蝶腭神经治疗PAR 40例（对照组），进行对比，借以探讨提高治疗PAR疗效的新方法。经随访半年疗效显著。现报告如下：

1 资料与方法

1.1 一般资料

按照1997海口会议修订的“变应性鼻炎诊断标准及疗效评定标准”[2]PAR患者80例，男37例，女43例，随机分为两组：观察组40例，男18例，女22例，年龄16～60岁，病程1～20 a，症状分级记分（8.27±1.73）分；对照组40例，男19例，女21例，年龄16～60岁，病程1～18 a，症状分级记分（8.35±1.65）分。两组患者的性别经χ^2检验，年龄、病程经t检验差异均无显著性（$P>0.05$），具有可比性。

1.2 方法

观察组：患者平卧位，在鼻内窥镜直视下，用2%地卡因肾上腺素棉片行鼻腔表面麻醉，1%利多卡因5 mL加1‰肾上腺素1滴行中鼻甲后端及蝶腭孔周围黏膜浸润麻醉。然后将已调至3档的KD 618型射频电离综合治疗仪的探头直接接触鼻后下神经及筛前神经的走行及分布区域，前者的治疗是将探头置于中、下鼻甲后端之间的鼻腔外侧壁由上向下作条状热凝，长约2.5 cm，宽0.5 cm，深达骨壁；后者是将探头对鼻丘和相对应的鼻中隔前上部黏膜进行热凝，范围约1.2 cm^2，使局部组织凝固，时间除鼻中隔处为2 s外，其余均为3 s，可反复热凝，以局部黏膜呈白斑状为宜，并对下鼻甲前端及内侧面黏膜行点状热凝。

对照组：麻醉方法及功率选择同观察组，在鼻内镜下将射频探头置于中鼻甲后上方蝶腭神经孔处作热凝治疗，直径约1.0 cm，深达骨壁，以阻断蝶腭神经。治疗后给予1%麻黄素液滴鼻并口服抗生素3～5 d，以减轻黏膜反应性肿胀及预防感染。治疗期间不用抗组胺等药物，以免干扰疗效观察。所有患者治疗后1周内，隔日复查清除鼻腔渗出物及纤维素膜，防止局部粘连。于治疗后半年随访复查，复查内容包括鼻部自觉症状改善情况和鼻腔检查所见。所有患者均只进行1次治疗。

1.3 疗效判定标准

参照1997年海口会议修订的“变应性鼻炎诊断标准及疗效评定标准”[2]。

1.4 统计学处理

计量资料用均数±标准差表示，计量资料比较用t检验，计数资料比较用χ^2检验。将治疗后半年的复查结果作为中期疗效评价的依据。

2 结果

2.1 观察组与对照组术后6个月疗效对比见附表。对照组总有效率为67.5%，观察组为100.0%。两组经统计学处理，差异具有显著性。观察组疗效明显优于对照组。

附表 观察组与对照组术后半年疗效对比 例（%）

组别	例数	显效	有效	无效	总有效率
对照组	40	10（25.0）	17（42.5）	13（32.5）	67.5
观察组	40	36（90.0）	4（10.0）	0（0）	100.0

注：χ^2=13.23，P<0.01

2.2 观察组患者在接受射频热凝鼻后下神经、筛前神经及下鼻甲治疗后2～5 d，可因鼻腔黏膜反应性水肿及渗出而出现鼻塞、流涕等症状，少数患者有涕中带血丝，1周后逐渐好转。对照组3例术中发生蝶腭动脉区域出血，经内镜下射频止血治愈。全部病例随访6个月，观察组治疗后4个月复发者2例，6个月后复发者2例，但症状均较术前轻。全部病例无鼻中隔穿孔、眼干、视力下降、及鼻腔干燥等并发症发生。

3 讨论

变应性鼻炎的发病机制尽管主要是抗原抗体反应，但其三大主要症状的产生与支配鼻黏膜的感觉神经以及两种植物神经失平衡密切相关，即与副交感神经功能亢进有关。鼻腔副交感神经主要来源于蝶腭神经（其在翼腭管走行中发支随鼻后下神经入鼻腔）及筛前神经鼻内支，下鼻甲内有胆碱能微神经节及副交感神经丛[3]。采用鼻内镜下射频热凝鼻后下神经、筛前神经鼻内支及下鼻甲治疗PAR，可广泛地阻断鼻腔副交感神经来源，降低副交感神经的兴奋性，降低鼻黏膜感觉灵敏部位敏感性以及感觉——副交感神经反射，破坏喷嚏反射弧传入通路，使鼻黏膜对外界刺激敏感性下降，血管扩张减轻，腺体分泌减少，鼻黏膜肿胀减轻，从而使患者的鼻痒、喷嚏、鼻塞、流涕等症状得以缓解或消除，达到治疗

（下转第243页）

入的药物接触面增大,同时因在清除过程中,对病灶的刺激,使病灶局部充血、血流加快,便于药物吸收,可提高局部的血药浓度[4]。MDR-TB大部分病程长、症状多,病理以变质坏死,纤维增殖为主,致血管稀少,局部血循环受限,病灶部位黏膜充血水肿,局部坏死组织及分泌物增多,单纯化疗由于药物较难渗入到病灶,即使有部分血流能通过支气管—肺屏障,药物也很难达到抑制和杀灭结核杆菌的有效浓度[5],疗效常不理想,乃至久治不愈。各级支气管黏膜均有很强的吸收药物的能力,肺泡毛细血管膜为吸收药物的最佳部位,纤支镜局部注药短期内被吸收,对肺或其他部位继发的细菌感染同时产生强大杀菌作用,迅速缓解呼吸道及全身症状。相关基础研究表明,肺泡上皮Ⅱ型细胞通过其表面的氨氯吡嗪咪敏感性钠通道将Na^+从肺泡腔面转运到基底侧,再由基底膜的Na^+-K^+-ATP酶将Na^+泵入肺间质,离子的主动转运带动了肺泡内液体的吸收,肺泡上皮的离子主动转运和液体再吸收功能使肺泡正常时得以保持干燥并进行有效的气体交换[6]。当注药液充满肺泡时,正常肺泡或轻度受损的肺泡可在短期内主动转运吸收药液,不致造成肺泡内液体潴留[7]。本研究应用丁胺卡那,左氧氟沙星,异烟肼三药联合经纤支镜给药治疗MDR-TB,结果9个月痰菌阴转率85.7%,病灶吸收好转率88.1%,空洞闭合率40.5%,显著高于对照组的64.1%、66.7%、17.9%。综上所述,经纤支镜局部注药是目前治疗MDR-TB的有效方法,其有净化空洞,促使痰菌转阴,空洞闭合的作用。此疗法的开展将对减少传染源,降低结核疫情,控制结核病流行有重要作用,并有安全,无明显毒副反应,并发症少的优点,值得临床应用。

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(赵梓屹　编辑)

(上接第240页)

PAR的目的。翼管神经作为支配鼻黏膜的主要副交感神经,切断后能够良好地控制变应性鼻炎的流涕及鼻塞症状已被国内外学者证实[1,4]。而鼻后下神经是来源于蝶腭神经节的翼管神经节后纤维及上颌神经感觉纤维,故切断该神经除能达到与翼管神经切断术相似的疗效,同时亦能较好地缓解喷嚏、鼻痒症状,而且,鼻后下神经内不含有支配泪腺的副交感神经纤维,故不会像翼管神经切断术那样引起眼干症状[5]。筛前神经既含有三叉神经第一支的感觉神经纤维,同时又接受来源于动眼神经核的副交感神经纤维,故切断该神经对缓解鼻部三大症状也能起到一定的作用。下鼻甲黏膜射频热凝术的作用机制,作者认为除了下鼻甲体积缩小及鼻腔通气得到改善外,还与下鼻甲内微神经节及副交感丛遭受破坏,使乙酰胆碱释放减少有关[6]。

本研究观察组与对照组术后6个月疗效对比差异具有显著性,说明射频热凝鼻后下神经、筛前神经及下鼻甲治疗PAR明显优于单纯热凝蝶腭神经的方法,其远期疗效有待进一步观察。该方法具有疗效显著、操作简便、无副作用等优点,值得临床采用。

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(赵梓屹　编辑)

Exhibit B

Article No.: 1007-1989(2005)03-0239-02

• Article •

Preliminary study on radiofrequency thermocoagulation of the posterior inferior nerve, anterior ethmoidal nerve, and inferior turbinate under nasal endoscopy for the treatment of perennial allergic rhinitis *

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Abstract: Objective To study a new method for improving the treatment of perennial allergic rhinitis (PAR). **Method** Eighty patients with perennial allergic rhinitis were randomly divided into two groups. The observation group included 40 patients who received radiofrequency thermocoagulation of the posterior inferior nerve, anterior ethmoidal nerve, and inferior turbinate under nasal endoscopy; the control group included 40 patients who received radiofrequency thermocoagulation of the sphenopalatine nerve under nasal endoscopy. The mid-term efficacy between the two groups was compared. **Results** The patients were followed up with for half a year, and the total effective rate in the observation group was 100% (36 patients achieved significant efficacy), while the control group achieved 67.5% (10 patients achieved significant efficacy). The total effective rate between the two groups showed significant differences ($P< 0.01$) according to the x^2 test. There were no complications in the observation group, while there were 3 cases of intraoperative bleeding in the control group. **Conclusion** Radiofrequency thermocoagulation of the posterior inferior nerve, anterior ethmoidal nerve, and inferior turbinate under nasal endoscopy for the treatment of PAR has advantages such as significant therapeutic effects, simple operation, and no side effects, with high clinical application values.

Keywords: Perennial allergic rhinitis; Posterior inferior nasal nerve; Sphenopalatine nerve; Anterior ethmoidal nerve; Radiofrequency
Chinese Library Classification No.: R765.213 **Document Code:** A

Radiofrequency treatment of nasal posterior-under nerve, ethmoidal nerve and infraturbinal for perennial allergic rhinitis under nasal endoscope *

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(Department of Otolaryngology, the People's Hospital of Guangxi Zhuang Autonomous Region, Nanning, Guangxi 530021, P.R. China)

Abstract:[Objective] To study a new method for perennial allergic rhinitis (PAR). **[Methods]** 80 cases of PAR randomly divided into 2 groups receive: observation group 40 cases treated with nasal posterior-under nerve, ethmoidal nerve and infraturbinal radiofrequency under nasal endoscope; control group 40 cases treated with sphenopalatine nerves radiofrequency under nasal endoscope. **[Results]** All the cases were follow-up half year postoperatively. The total effective rate was 100% in observation group (excellent 90%) and 67.5% in control group (excellent 25%). There was significant difference ($P< 0.01$) between the group in efficacy. The complication was not observed in observation group and massive intraoperation hemorrhage ($n = 3$) was observed in control group. **[Conclusions]** The method that is treating PAR with nasal posterior-under nerve, ethmoidal nerve and infraturbinal radiofrequency under nasal endoscope is highly effective, easy to perform and few complications, so it is a good way to treat PAR.

Key words:perennial allergic rhinitis; nasal posterior-under nerve; sphenopalatine nerve; ethmoidal nerve; radiofrequency

Abnormal increase in excitability of the nasal parasympathetic nerve plays an important role in the pathogenesis of perennial allergic rhinitis (PAR). In the past, pterygoid canal neurotomy was used to treat PAR. Although the long-term effective rate could reach76.0%[1] due to severe trauma and the possibility of postoperative complications such as dry eyes, its use was limited to some extent. In view of this, we made improvements to this surgery. From September 2002 to March 2003, 40 patients with PAR (observation group) were treated with radiofrequency

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thermocoagulation of the posterior inferior nasal nerve, anterior ethmoidal nerve, and inferior turbinate under nasal endoscopy, and comparison was made with another group (control group) of 40 patients with PAR treated with only radiofrequency thermocoagulation of the sphenopalatine nerve under nasal endoscopy in order to study the new method to improve the therapeutic effect of PAR. After six months of follow-up, the therapeutic effect was significant. Now, a report is given as follows:

1 Data and Methods

1.1 General data

According to the revised "Diagnostic Criteria and Efficacy Evaluation Criteria for Allergic Rhinitis"[2] at the 1997 Haikou Conference, there were 80 patients with PAR, including 37 males and 43 females. They were randomly divided into two groups: the observation group having 40 patients, including 18 males and 22 females, aged at 16-60 years old, with a disease course of 1-20a and a symptom grading score of (8.27 ± 1.73) points, and the control group having 40 patients, including 19 males and 21 females, aged at 16-60 years old, with a disease course of 1-18a and a symptom grading score of (8.35 ± 1.65) points. The gender of the patients in the two groups was tested using x^2, and there was no significant difference in age and course of disease by the *t* test ($P > 0.05$), showing that there was comparability.

1.2 Methods

Observation group: The patients were put in the supine position and subjected to nasal surface anesthesia using 2% tetracaine adrenaline cotton pads under direct nasal endoscopy, and 5 mL of 1% lidocaine added with 1 drop of 1‰ adrenaline was used for mucosal infiltration anesthesia around the posterior middle turbinate and the sphenopalatine foramen. Then, the probe of the KD 618 radiofrequency ionization comprehensive therapy instrument, which had been adjusted to Level 3, was directly contacted with the route and distribution area of the posterior inferior nasal nerve and the anterior ethmoidal nerve. The treatment for the former involved placing the probe on the lateral wall of the nasal cavity between the posterior end of the middle and inferior turbinate, making a strip-shaped thermocoagulation from the top to the bottom with a length of about 2.5 cm, a width of 0.5 cm, and a depth up to the bone wall; the treatment for the latter involved thermocoagulation using the probe on the nasal ridge and the corresponding anterior upper mucosa of the nasal septum with a range of approximately 1.2 cm², allowing the local tissues to coagulate for 3 seconds, except for 2 seconds for the nasal septum. Repeated thermocoagulation was allowed, with the local mucosa appearing as white patches. Spot-like thermocoagulation was also performed on the anterior and medial mucosa of the inferior turbinate.

Control group: The anesthesia method and power selection were the same as those for the observation group. Under nasal endoscopy, the radiofrequency probe was placed at the posterior upper sphenopalatine nerve foramen above the middle turbinate for thermocoagulation treatment, with a diameter of about 1.0 cm and a depth up to the bone wall to block the sphenopalatine nerve. After treatment, 1% ephedrine solution was given to drop into the nasal cavity, and oral antibiotics were administered for 3-5 days to reduce mucosal reactive swelling and prevent infection. During the period of treatment, antihistamines and other drugs were not used to avoid interfering with the observation of the therapeutic effects. Within one week after treatment, all the patients underwent a follow-up examination every other day to remove nasal exudates and cellulose membranes to prevent local adhesions. Follow-up examination was carried out half a year after treatment concerning the improvement of nasal symptoms and the findings from nasal examination. All the patients were treated only once.

1.3 Evaluation criteria for efficacy

References were made to the "Diagnostic Criteria and Efficacy Evaluation Criteria for Allergic Rhinitis" revised at the 1997 Haikou Conference.[2]

1.4 Statistical processing

The measurement data were expressed as mean ± standard deviation, the comparison of measurement data was performed using the *t* test, and the comparison of numeration data was performed using the x^2 test. The follow-up results after half a year of treatment were used as the basis for mid-term efficacy evaluation.

2 Results

2.1 The comparison of the therapeutic effects between the observation group and the control group at 6 months after the surgery is shown in the table below. The total effective rate of the control group was 67.5%, while that of the observation group was 100.0%. The two groups showed significant differences after statistical analysis. The therapeutic effect of the observation group was significantly better than that of the control group.

Table Comparison of therapeutic effects between the observation group and the control group at half a year after the surgery, in number of patients (%)

Group	Number of patients	Significant	Effective	Ineffective	Total effective rate
Control group	40	10 (25.0)	17 (42.5)	13 (32.5)	67.5
Observation group	40	36 (90.0)	4 (10.0)	0 (0)	100.0

Note: $x^2 = 13.23$, $P < 0.01$

2.2 After receiving radiofrequency thermocoagulation of the posterior inferior nerve, anterior ethmoidal nerve, and inferior turbinate for 2-5 days, the patients in the observation group might experience symptoms such as nasal congestion and runny nose due to reactive edema and exudation of the nasal mucosa. A small number of patients might have bloody streaks in their nasal mucus, which were gradually improved after 1 week. Three patients in the control group experienced intraoperative bleeding in the sphenopalatine artery area, which was cured using endoscopic radiofrequency hemostasis. All the patients were followed up with for 6 months. In the observation group, there were 2 cases of recurrence at 4 months after treatment and 2 cases of recurrence at 6 months after treatment, but the symptoms were milder than those before the surgery. All the patients had no complications such as nasal septal perforation, dry eyes, decreased vision, or nasal dryness.

3 Discussions

Although the pathogenesis of allergic rhinitis is mainly antigen-antibody reactions, the occurrence of its three main symptoms is closely related to the imbalance of the sensory nerves innervating the nasal mucosa and the two types of vegetative nerves, that is, it is related to parasympathetic hyperfunction. The parasympathetic nerves in the nasal cavity mainly originate from the sphenopalatine nerves (which branch into the nasal cavity along with the posterior inferior nasal nerves in the pterygopalatine canal) and the medial branch of the anterior ethmoidal nerves. In the inferior turbinate, there are cholinergic nerves and parasympathetic nerve plexus.[3] The use of radiofrequency thermocoagulation of the posterior inferior nasal nerve, anterior ethmoidal nerves, and inferior turbinate under nasal endoscopy for the treatment of PAR can widely block the source of the parasympathetic nerves in the nasal cavity and reduce the excitability of the parasympathetic nerves, the sensitivity of the nasal mucosa to sensitive areas, and the sensory-parasympathetic reflex. This can disrupt the sneezing reflex arc input pathway, reduce the sensitivity of the nasal mucosa to external stimuli, reduce vascular dilation, reduce the gland secretion, and reduce the swelling of the nasal mucosa, which can thereby alleviate or eliminate symptoms such as nasal itching, sneezing, nasal congestion, and runny nose in…

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the contact surface of the drug is increased, and, due to the stimulation of the lesion during the clearance process, the local congestion and blood flow of the lesion are accelerated, which facilitates drug absorption and can increase the local blood drug concentration.[4] Most MDR-TB cases have a long course of disease and multiple symptoms. The pathology is mainly characterized by degeneration, necrosis, and fiber proliferation, resulting in sparse blood vessels, limited local blood circulation, mucosal congestion and edema at the lesion site, and an increase in local necrotic tissues and secretions. Using only chemotherapy makes it difficult for drugs to penetrate the lesion, and even if some blood flow can pass through the bronchopulmonary barrier, it is difficult for drugs to reach effective concentrations that inhibit and kill tuberculosis bacteria,[5] and the therapeutic effect is often not ideal, and the disease even persists for a long time. The bronchial mucosa at all levels has a strong ability to absorb drugs, and the alveolar capillary membrane is the optimal site for drug absorption. Drugs locally injected through fiberoptic bronchoscopy are absorbed in a short period of time, producing a strong bactericidal effect on secondary bacterial infections on the lungs or other parts and quickly alleviating respiratory and systemic symptoms. The related basic studies have shown that alveolar epithelial type II cells transport Na^+ from the alveolar surface to the basal side through their surface amiloride hydrochloride hydrate sensitive sodium channel, and then pump Na^+ into the pulmonary interstitium through the Na^+-K^+-ATPase of the basal membrane. The active transport of ions drives the absorption of liquid in the alveoli. The active transport and liquid reabsorption functions of the alveolar epithelium enable the alveoli to remain dry and undergo effective gas exchange during normal conditions.[6] When the injection fluid fills the alveoli, the normal alveoli or slightly damaged alveoli can actively transport and absorb the drug fluid in a short period of time without causing fluid retention in the alveoli.[7] In this study, amikacin, levofloxacin, and isoniazid were used in combination with fiberoptic bronchoscopy to treat MDR-TB. The 9-month sputum negative conversion rate was 85.79%, lesion absorption improvement rate was 88.1%, and cavity closure rate was 40.5%, which were significantly higher than 64.1%, 66.7%, and 17.9% in the control group. In summary, local drug injection through fiberoptic bronchoscopy is currently an effective method for treating MDR-TB, which has the effect of purifying cavities, promoting sputum bacteria to turn negative, and closing cavities. The development of this therapy will play an important role in reducing the source of infection, reducing the epidemic condition of tuberculosis, and controlling the prevalence of tuberculosis. It has the advantages of safety, no obvious toxic and side effects, and few complications, and is worthy of clinical use.

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…patients, achieving the objective of treating PAR. The pterygoid canal nerve, as the main parasympathetic nerve innervating the nasal mucosa, can effectively control the symptoms of watery nasal discharge and congestion in allergic rhinitis after being cut off, which has been confirmed by domestic and foreign scholars.[1,4] The posterior inferior nasal nerve is derived from the postganglionic fibers of the pterygoid canal nerve and the sensory fibers of the maxillary nerve in the sphenopalatine ganglion. Therefore, cutting off the nerve can not only achieve a similar therapeutic effect as that of the pterygoid canal nerve cutting surgery, but also effectively alleviate symptoms of sneezing and nasal itching. Moreover, the posterior inferior nasal nerve does not contain parasympathetic nerve fibers that innervate the lacrimal gland, so it will not cause dry eye symptoms like those of pterygoid canal nerve cutting surgery.[5] The anterior ethmoidal nerve contains both the sensory nerve fibers of the first branch of the trigeminal nerve and the parasympathetic nerve fibers originating from the oculomotor nucleus. Therefore, cutting off this nerve can also play a certain role in alleviating the three major nasal symptoms. In the opinions of the authors, the mechanism of radiofrequency thermocoagulation of the inferior turbinate mucosa is not only related to the reduction of inferior turbinate volume and improvement of nasal ventilation, but also to the destruction of the microganglia and parasympathetic plexus in the inferior turbinate, resulting in a decrease in acetylcholine release.[6]

In this study, there was a significant difference in the efficacy between the observation group and the control group after 6 months of surgery, indicating that radiofrequency thermocoagulation of the posterior inferior nasal nerve, anterior ethmoidal nerve, and inferior turbinate for the treatment of PAR is significantly superior to the method of thermocoagulation of the sphenopalatine nerve only, but with further observation needed for its long-term efficacy. This method has the advantages of significant therapeutic effect, simple operation, and no side effects, and is worthy of clinical use.

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