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## The change of cilium's function and the ostiomeatal complex mucosal

Li Ruiyu<sup>1\*</sup>, Ma Xueyu<sup>2</sup>, Li Meng<sup>3</sup>, Guo Kaoshan<sup>1</sup>, Hou Jinjie<sup>1</sup>, Wu Liping<sup>4</sup>

1 Institute for Integrated Traditional and Western Medicine, Second Affiliated Hospital,  
Xingtai Medical College, 054000, Xingtai, Hebei, (CHINA)

2 Department of Education Science Teaching, Xingtai University, 054000, Xingtai, Hebei, (CHINA)

3 Department of Health, Hotan Detachment of the Xinjiang Armed Police Corps, 848011, Hotan, Xinjiang, (CHINA)

4 Department of Clinical Laboratory, Xingtai People's Hospital, 054000, Xingtai, Hebei, (CHINA)

E-mail: liruiyu651021@163.com

### ABSTRACT

Objective: Talk about the change of cilium's function and the ostiomcatal complex mucosal ultrestructure after maxillary sinus cyst operation treatment and nonoperational treatment methods: choose 63 patients and divided them into 2 groups. then cut down the tumor. Then inject the medicine and observe the patient of the two groups use some methods to observe the changes. Results: in surgical treatment group, nasal mucosa cilia propagation velocity is  $4.08 \pm 1.26$  mm/min. In the other group, the space is  $8.23 \pm 2.13$  mm/min. The difference is obvious between the two groups. According to the electronic microscope cilium is less and chaos arranged, parts of cells come off, local edema, minor Neutrogena. and goblet cells. In cross-section contains: 9+2 microtubules in contrast group, cilium is cilia-arrangement and thickness, abundant and intensive. 9+2 microtub is clearly built. Conclusion: nonoperational treatment doesn't affect the transfer rate of cilia propagation velocity and cilium's physical function.

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### KEYWORDS

Nasal endoscopic surgery;  
Maxillary;  
Non-surgical;  
Cilia transmission rate.

### INTRODUCTION

Maxillary sinus cyst is a kind of common disease in otolaryngology department, it maybe caused by mucus gland obstruction, gland secretion retention, or due to inflammation or allergic reaction, causing the capillaries with the seepage flow of slurry storage and sub mucosa connective tissue, and gradually expands to form. Its main symptoms include headache, facial discomfort and sometimes cause bad eyesight. With the development of Minimally invasive surgery and Functional endoscopic

sinus surgery, the traditional Caldwell-Luc operation has been replaced by nasal endoscopic surgery. Endoscopic treatment of maxillary sinus cyst is by far the most commonly used surgical method, but still has some local mucosal damage and impact<sup>[1,3,10]</sup>. We integrated a non-surgical therapy and obtained national invention patent, the clinical application of equal effect with the operation. This thesis is to discuss he influence of the changes in ultra structure and function of cilia through observing two methods in curing the local mucous membrane of the nasal passages complex.

## MATERIAL AND METHODS

### General information

63 cases are collected in this group., which were the patients suffered from maxillary sinus cyst from October, 2009 to October, 2012. they were divided into two groups: the first is Nasal endoscopic surgery group (treatment group) including 34 cases, of which 22 cases are men and 12 cases are women. their Ages ranged from 12 to 46., average  $25.5 \pm 2.2$  years old; Unilateral lesions in 30 cases, bilateral lesion in 4 cases; 26 patients with history of headache, fullness in head, blurred vision, etc, 8 cases of patients without any symptoms. The other group is Non surgical group (control group) including 30 cases, of which 20 cases are males and 10 are females, 14 to 49 years old, average age  $31.8 \pm 9.7$ , unilateral lesions in 28 cases, bilateral lesions in 2 cases; 25 patients, head bilges, blurred vision, such as history, 5 cases without any symptoms; All patients with pre-operative conventional line sinus coronal CT Scan confined.

### Operation method in treatment group

General anesthesia. 10% cotton piece convergence of ephedrine nasal. The Messer—Klinger<sup>[7]</sup> operation 0 degrees under nasal endoscopic (produced in Tonglu, Hangzhou) resection of lateral ham ate process, open and expand maxillary sinus natural openings. Such as the screen bubbles influence open resection screen bubble front wall of maxillary sinus natural openings. Completely stop the bleeding.

Then choose the appropriate Long mucosa forceps to tear in addition to the theca Sal, shave their root cyst mucosa, net absorption, and try to keep the normal mucosa. Located in the bottom wall of maxillary sinus cyst or inside capsule wall by direct removal of maxillary sinus natural mouth not easily, use electric cutter (Med-Tronic XPS 3000) resection of cyst. After operation, flush the sinus cavity with physiological saline, fill the nose with Vaseline gauze. It is useful to inject 5d antibiotics to protect from injection after the treatment of the operation. Then draw off the nasal gauze string little by little after 48 hours. You should clean the nasal cavity once a day in the following three days. We can determine the times of further consultation according to the condition of the nasal cavity. After the operation,

you'd better wash the nasal cavity using normal saline at both the fifth day and the fourteenth day once.

### None-operation group (Comparison Group)

According to the place of sinus cavity in the sinus cavity, adopt surface anesthesia or local anesthesia; generally puncture at the second incisor through inferior nasal meatus or labiogingival groove. The purpose is to put the puncture needle into the cyst part extracting cyst fluid and inject our invented patented drugs (cyst fluid 2ml, drugs for curing sinus cavity 1ml). According to the amount of cyst fluid, the main component of the drugs is the super oxidation of iodine atom.

## THE OBSERVATION INDEX AND TEXT METHOD

The Position and the Time to Take Nasal Mucosa: Two groups all around the postoperative 3 months from the maxillary sinus. Mucosal collect immediately after put in 25% glutaraldehyde solution. Stoves in the 4! refrigerator.

### Specimen collection method

After cleaning up nasal sections with the method that Ni Yan Li sac charm test<sup>[4]</sup> and others introduce, put sac charm crystalline particles with diameter of 5cm in surface of mucosa in front of the back of the inferior turbinate about 0.5 cm. The slender swab should be interposed gently from external nostril to retropharyngeal space, then measure the distance between the location of saccharin and the posterior pharyngeal wall space. The time from putting saccharin to taste sweet is the mucociliary transport time and the quotient is the Mucociliary transport rate.

### Election-microscopy Observation

Glutaraldehyde fixation is 2.5%, and potassium acid is 1%. Stained with both urine acetate and load citrate and embedded with Epon-x12 resin, then cut by LKB-2008 ultra microtome, finally watched through H-600 electron microscope.

### Statistical method

Use spss11.0 statistical software to analyze the results, measurement date is expressed by mean standard deviation ( $\bar{x} \pm s$ ); mean comparisons between groups uses "t" test.

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## RESULTS

**Nasal endoscopy surgery groups 3 months later after surgery**

There is a big difference between the treatment groups and the control groups on the results of saccharin test ( $P < 0.05$ ).

**TABLE 1 : Results of saccharin test ( $\bar{x} \pm S$ )**

Groups	n	MTR (mm/min)
Three months after surgery	34	4.08±1.26
Control	30	8.23±2.31※

Vscontrolgroup: ※ $P < 0.05$

**Election-microscopy observation**

The number of cilia of the treatment groups is obvious less and ranged in a mess after 3 months. Some cell parts of the cilia are fallen. There are some are edematous in the interstitial intermediate in which we can see a few neutrophils and goblet cells. Some "9+2" microtubules structure are appearing on the cross-section of the cilia. However the cilia of the control groups are ranged in alignment, thickness and all in the same direction. Also the cilia are plentiful and concentrated.

## DISCUSS

**Anatomy of maxillary sinus and operation effect**

The normal nasal and sinus mucosa are pseudo stratified ciliated columnar epithelium, whose every cell has 50-300 cilia. And the characteristics of normal ciliated cross section are 9 peripheral micro tubules winding two central micro tubes, which will compose the so-called type of "9+2". And every pair of peripheral micro tubules also has internal and external dyne in arm.

The rate of the cilia transmission is 6 to 11 mm/min<sup>[8]</sup>. After nasal mucosa cilia movement direction is direct from the front to rear nostril. Sinus mucosa cilia movement direction is from the week of sinus cavity wall to the natural sinus. It is this kind of swinging which has direction and rhythm that can eliminate the microorganisms, allergen and other stimulating factors that go into the nasal cavity.

Maxillary sinus nasal cilia and mucus transport always clear direction towards natural, even inferior meat us Windaus that open, transfer and clear direction will

not change its mucus. maxillary sinus surgery in nasal Middle meat us is the base of maxillary sinus in Endoscopic Sinus Surgery Operation, minimal impact on its anatomical structure and physiological function.

However, because of the dissection characteristics - the aditus ant rum is high and behind and the limitation of present operation apparatus, this operation way can't handle with any area of maxillary sinus. Especially when the maxillary sinus gasifies obviously, it is difficult to observe and deal with some parts that from objectively through the ostium of middle nasal meat us, such as the anterior maxillary sinus wall, the anterior lacrimal crypt, the alveolus crypt and so on<sup>[5,6,11]</sup>.

**Nasal endoscopic surgery with nonoperational treatment of maxillary sinus cyst preliminary observation**

Due to mucosal regeneration after nasal endoscopic surgery, inflammatory reaction may have to change the bone wall and mucous the epithelium associated physiological barrier function. Thus affect the mucous repair and regeneration<sup>[2]</sup>. As minimally invasive surgery and functional nasal endoscopic development and application. traditional ke a land types has been gradually replaced by a nasal endoscopic surgery.

Nasal endoscopic surgery still can appear the nasal mucous membrane is dry, damage the nasolacrimal duct. such as the limited view of factors affecting local mucosal function<sup>[9]</sup>, in how to solve the pain of maxillary sinus cyst both clinically and discomfort. And does not damage the physiological function of local mucosa, is our efforts direction. We use of iodine atoms in the many years of experience of super oxidation treatment of maxillary sinus cyst curative effect is distinct and obtained national invention patent. so we use currently accepted smaller injury nasal endoscopic surgery treatment of maxillary sinus cyst.

We used the experiences about are and achieved the national fame. so we used the operation to cure the disease. and compare technology, the results that after operation the 3 months' speed is 4.08±1.26 mm/min. and nonoperational is 8.23±2.31 mm/min. There is a big difference electronic microscope observation after 3 months of nasal endoscopic surgery group number visible cilia, arrangement is disorder falls off part of cillratel cells, interstitial edema of visible part, can be

found in a small amount of neutrophils and goblet cells. Cilia cross-sectional has visible pair of the "9+2" microtubule structure, visible in the control group after 3 months cilia arranged neatly, even thickness, in the same direction, and rich dense cilia. "9+2" microtubule structure is clear, mitochondria structure is normal. Results show that the nonsurgical group in cilia transfer rate is the number of cilia arranged in the surgical group and other factors are more obviously, the preliminary view of nonoperative superior endoscopic sinus surgery, is the ideal therapy for medial maxillary sinus cyst.

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