Intranasal Antrostomy with Nasoantral Window-Plasty

(Kim’s Antrostomy)

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ABSTRACT

The author, since 1969, has established and had experience with an ideal antral window operation as a simple type of intranasal surgery using a double flap mucous-plasty in the treatment of chronic maxillary sinusitis. This intranasal antrostomy with nasoantral window-plasty is an ideal technique in sinusitis cases with mildly infamed and reversible conditions, without polyoid and highly thickened mu cosa of the maxillary antrum, and has provided satisfactory surgical results with the following advantages:

1. It prevents the postoperative occurrence of unpleasant complications such as cheek swelling, dental and labial numbness, obstruction of the nasolacrimal passage due to over-curettage, osteomyelitis and postoperative cheek cyst as in cases following radical surgery.

2. The technique of two mucosal flaps taken from the nasal cavity and the maxillary antrum covers the up- and down-margin of the window and can prevent postoperative bony bleeding and reclosing of the window due to over-granulation, and consequently can keep the nasoantral window permanently open for free drainage.

3. The operation is very simple and conveniently performed under local anesthesia and requires minimal hospitalization.

4. There is minimal reaction, and minimal injury to the mu cosa which rapidly returns to normal function.

5. High antroscopic visibility, to determine the status of the antral interior at all times during the surgery and the postoperative treatment, is provided.

6. In consideration of excretory function, ventilation and directional ciliary beating of the antral mucosa, the author believes that this intranasal antrostomy with nasoantral window-plasty is ideal and a better procedure than other simple antrostomies and better than Boeninghaus’s single flap-plasty in the choice of different plastic techniques of the mucosal flap, and also this operation can proceed to a radical antral procedure.

INTRODUCTION

In our daily otolaryngologic clinics in Korea we see a large number of cases of paranasal sinusitis. About one third of the patients coming to the clinic have nasal diseases, and one half of that number have paranasal sinusitis, and most of these have maxillary sinusitis.

We are frequently asked by these patients whether the sinusitis will recur after operation, and whether the operation can really heal the
sinusitis. Furthermore we often surprised to find normal mucous membrane in the patient who has undergone operation. Therefore we are reminded of the difficulties of correct diagnosis and of treatment of sinusitis.

Physically, the normal mucous membrane of the maxillary sinus is continuous with that of the nasal fossa, although thinner and containing fewer glands. It is composed of a pseudo-stratified ciliated columnar epithelium resting on a thin and delicate basement membrane and tunica propria consisting of fibrous connective tissue which superficially is arranged somewhat loosely, while deeper it is more compact and blends with the periostium. The glands are found in the tunica propria and are most numerous near the ostium of the antrum of Highmore. The ciliary motion, which is more prominent near the ostium, maintains a constant direction flow towards the natural ostium even when an artificial antrostomy by surgery for the antral opening has been made.

For a long time many scholars and doctors have tried to contrive a surgical technique to maintain normal drainage and ventilation of the paranasal sinuses by preserving normal mucous membrane, even though it is difficult to differentiate the pathology in the nasal cavity and the paranasal sinuses.

Maxillary antrostomy which started in Europe was primarily to make an opening into the maxillary antrum, but the purpose of conservative surgery is to keep the opening in function as permanently as possible by preserving the mucous membrane of the maxillary antrum. From this basic concept, many surgical procedures have been attempted and developed by Mikulics, Shahimiam, Goodyear, McNaught, Boeninghaus, John Hunter, Denker, Watsuji, Hajek, Ballenger, Canfield, Sturmann, Halle, Scott-Brown and by many other scholars and doctors since the later part of the 19th century. Thus today, it has become an established trend to preserve the mucous membrane of the maxillary antrum when the pathology is mild. In order to prevent an early closure of the opening of the antral window, which is often the cause of recurring maxillary sinusitis, the author has attempted to develop a new surgical procedure for chronic maxillary sinusitis which is intranasal antrostomy with nasoantral window-plasty and is also called Kim’s antrostomy. Now the author will try to explain this new method of antrostomy.

**DIAGNOSIS AND INDICATIONS**

It is hard to say in one word which cases need radical surgery and which cases need antrostomy as a conservative measure. A correct diagnosis requires confirmatory findings from pathology, radiology and the excretory function of the maxillary sinus at the antrum of Highmore.

The author has decided on the indications as follows:

First, cases in which the mucous membrane can be functionally reversible.

Second, cases which do not heal satisfactorily with medical management and where the sinusitis easily recurs after medical treatment is stopped.

Third, cases in which radiological and morphological abnormalities are not found, pathology is mild, polypoid and hypertrophic mucous changes or polyps are not found, duration is relatively short, and the cases are fresh in that no surgery has been performed before on the maxillary antrum.

For these three groups, the author would like to recommend this new method of forming the nasoantral window to preserve the antral
ciliary mechanism and to maintain free drainage through the window. This operation will reversibly normalize the ciliary function of the antral mucous membrane. At the same time two mucous membrane flaps serve to prevent early closure of the window of this antrostomy.

PREMEDICATION

When surgery is decided upon, clean up the nasal cavity by douche and give 1.5 gr Nembutal, 100 mg Demerol HCl, and if necessary give an additional 50–100 mg Demerol HCl immediately before the operation to make the patient heavily sedated which allows the patient to be aroused but not to feel much pain during the operation. At the same time there is also an additional pretreatment of inserting a cotton pledget soaked 10 per cent cocaine in 1/1000 adrenalin solution or 2 per cent pontocaine in 1 per cent ephedrine solution into the nasal cavity, particularly into the inferior nasal meatus between the inferior nasal concha and lateral wall of the meatus. The author prefers the later combined method because the nasal reaction is more mild.

ANESTHESIA

In most adult cases, the before mentioned treatment is sufficient, but operation with the additional injection of 2 per cent xylocaine into the nasal mucous membrane in the surgical field is more desirable because it minimizes bleeding, thus providing better viewing of the surgical field. In the case of children, however, an endotracheal general anesthesia is needed.

PATIENT POSTURE

In general the operation can be performed in the sitting position, but the normal dorsal position is needed when general anesthesia is given.

SURGICAL TECHNIQUE

Although many techniques have been developed, a common objective has been the making of a permanent and adequate opening of the nasoantral window in order to improve the antral ventilation and excretion, and to increase the reversibility of the antral mucous membrane.

The author's technique is as follows:
First remove the cotton pledge from the nasal cavity. Dilate the anterior nares and expose the inferior nasal meatus as a dissector is indicated by using a nasal speculum as shown in Fig. A. Expose the surgical field in the lateral portion of the inferior nasal meatus by inserting a heavy dissector and pushing up the inferior concha for making a widened and well visualized operative field as shown in Fig. B, H and I.

The next step in the traditional methods of Canfield-Sturmann and Halle were to perforate an opening through the lateral wall of the nasal cavity directly into the maxillary sinus by using a trocar, but the author’s method is different and is shown in Fig. C, D and J.

That is: Make an incision anteriorly in the lateral mucous membrane along the dermo-mucosal line, elevate both mucous membrane and periostium and expose the lateral bony wall as when a submucous resection for the nasal septum is done. Then, superiorly to the junction of inferior concha, inferiorly to the nasal floor, posteriorly close to the natural ostium of the maxillary antrum thereby shifting them toward the nasal septum, insert and dilate the Killian’s nasal speculum deeply into the newly exposed field. Next, chisel out the lateral bony wall by using a chisel and stanze, elevate the antral mucous membrane, and make a window about
2×1.5 cm, round and smooth margined without damaging the antral mucous membrane, as shown in Fig. E, F, G and K. Next, curette out, especially antero-inferiorly, the bony margins of the window by using the stanze and curette in order to ensure smooth flow of antral content into the nasal cavity after the nasoantral window is completed.

Then using a #11 blade, make two vertical incisions on anterior and posterior ends of both the nasal and antral mucous membrane through the bony window. Then cut the upper part of the antral mucous membrane and lower part of the nasal mucous membrane, thereby making two mucosal flaps. Reflect the antral flap on the basal floor of the nasal cavity, and reflect the nasal flap covers on the upper margin of the window as shown in Fig. L. During these procedures the operator must be careful not to injure the opening of the naso-lacrimal duct and the septal mucous membrane.

Finally examine the maxillary antrum through the newly completed nasoantral window and then replace the inferior concha back to the original position as shown in Fig. M.

Usually postoperative packing is not necessary. If bleeding is troublesome, the window may be packed with vaseline gauze for 24–48 hours.

**DISCUSSION**

A common concern in antrum operations through the traditional method has been the fear of recurrence of the sinusitis due to early reclosure of the operated window, but the author’s method helps to ensure the permanent opening as the window through this simple intranasal surgery of nasoantral double-flap window-plasty, and this is an improvement over Boenninghaus's single-flap plasty.

Because, in this method, the mucous membrane covers both superior and inferior bony margins of the window, it prevents the formation of granulation and epithelial overgrowth from the margin of the operative window, which is the cause of the reclosure of the window.

At the same time, the antral mucous membrane is reflected into the nasal floor, instead of reflecting nasal mucous membrane into the antral base as in Boenninghaus's method. This helps to make a smoother and more complete excretion of the pathologic antral contents, considering the direction of ciliary beating from the maxillary antrum into the nasal cavity.

This antrostomy also is more easily adoptable due to the recent development of microsurgery. Therefore this author would like to recommend the trial of this intranasal antrostomy with nasoantral window-plasty before doing the traditional radical surgery for chronic maxillary sinusitis.

**REFERENCES**


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