

## ANTRAL POLYP VERSUS MAXILLARY SINUSITIS

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**Abstract**

A patient complaining of chronic dull pain in the right maxillary area showed slight haziness and small ovoid radiopacity in the right antrum, which was not extended into the choanal area in radiographic views. At operation, lots of mucoid fluid admixed myxoid soft tissues was discharged and the polypoid mucosal tissues were removed. In histological examination, the removed tissues showed a polyp by the overgrowth of dermal connective tissues exhibiting severe myxoid degeneration. Throughout the entire specimen, the inflammatory reaction was diffuse but not so remarkable to produce the mucosal thickening and necrosis. The polypoid tissues were diffusely infiltrated with neutrophils and plasma cells, but few eosinophils, resulted in the extensive myxoid degeneration together with severe vascular degeneration. Therefore, we suggest that the antral polyp is basically different in its pathogenesis and prognosis from the common maxillary sinusitis of odontogenic origin, thus the antral polyp should be carefully diagnosed when the inflamed antral lesion is recurred and diffusely degenerative with myxoid changes.

**Key words:** Antral polyp, Chronic maxillary sinusitis, Pathogenesis

## I. INTRODUCTION

Chronic maxillary sinusitis is a persistent infection of the sinuses lasting more than 3 months, and ventilator obstruction of the sinus ostium plays the key role in the pathogenesis of sinusitis<sup>1)</sup>. After the obstruction of the sinus ostium, intrasinus oxygen pressure and mucociliary activity decreases, toxic products increase, fluid accumulates into the sinus, and fluid becomes dense and prepares an appropriate environment for proliferation of aerobic and anaerobic bacteria<sup>2)</sup>. The virulence of the microorganism causing sinusitis condition of the sinus mucosa,

changes in the mucociliary clearance, and immunoresistance of the host are effective in the pathogenesis of sinusitis<sup>3)</sup>. Chronic maxillary sinusitis of dental origin is a common disease, and there were studies reporting that chronic inflammation in the maxillary sinus, had dental origin in 14~24% of cases<sup>4)</sup>. Chronic maxillary sinusitis of dental origin may be caused by the following: chronic oral antral fistula, foreign bodies (dental fillings, teeth roots, parts of broken instruments, or packing materials) pushed through the root canal or periapical granulomas or small inflammatory cysts of the molars and bicuspid, or large odontogenic cysts occupying

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total or subtotal space of the maxillary sinus<sup>4</sup>.

Diagnosing sinus diseases of odontogenic origin is based on a thorough dental and medical examination that includes the evaluation of the patient's symptoms and past medical and dental history and correlating them with the presenting physical findings<sup>5</sup>. The cause of chronic maxillary sinusitis has been described as dental, rhinogenous, or allergic, and differential diagnosis with histamine-related maxillary sinus hyperreactivity, allergic rhinitis, eosinophilia, antral polyp<sup>6</sup> should be performed<sup>7</sup>. Otolaryngological evaluation using rhinoscopy, nasal and sinus endoscopy, aspiration of sinus contents for cytological, and microbiological assessments can further assist in making the correct diagnosis<sup>5</sup>.

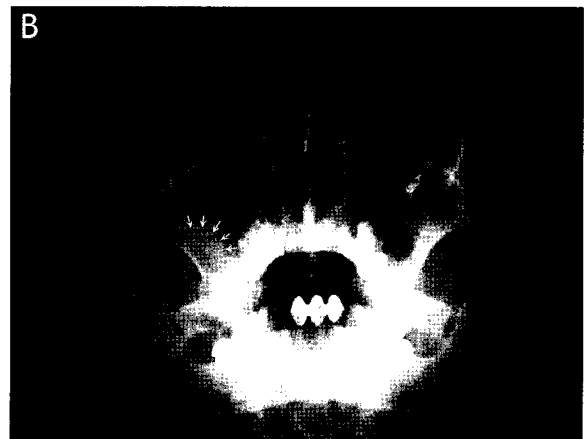
Antrochoanal polyp is a maxillary sinus polyp that originates in the maxillary sinus, passes through a sinus ostium and extends into the choana. It represents approximately 4-6% of all nasal polyps in the general population. Antrochoanal polyp is almost always unilateral and occurs most commonly in children and young adults. Nasal obstruction and nasal drainage are the most common symptoms<sup>8</sup>. Expression of the maxillary antrum with evident fullness of cheek and erosion of the lateral nasal wall, epistaxis, a

huge antrochoanal polyp per mouth, sudden presentation of a polypoid mass filling the oral cavity up to the incisors, and obstructive sleep apnea with subnormal growth velocity were reported<sup>9</sup>. Juvenile angiofibroma, encephalocele, nasopharyngeal malignancies, grossly enlarged adenoids and turbinates and nasal polyposis should be kept in mind in differential diagnosis<sup>8</sup>.

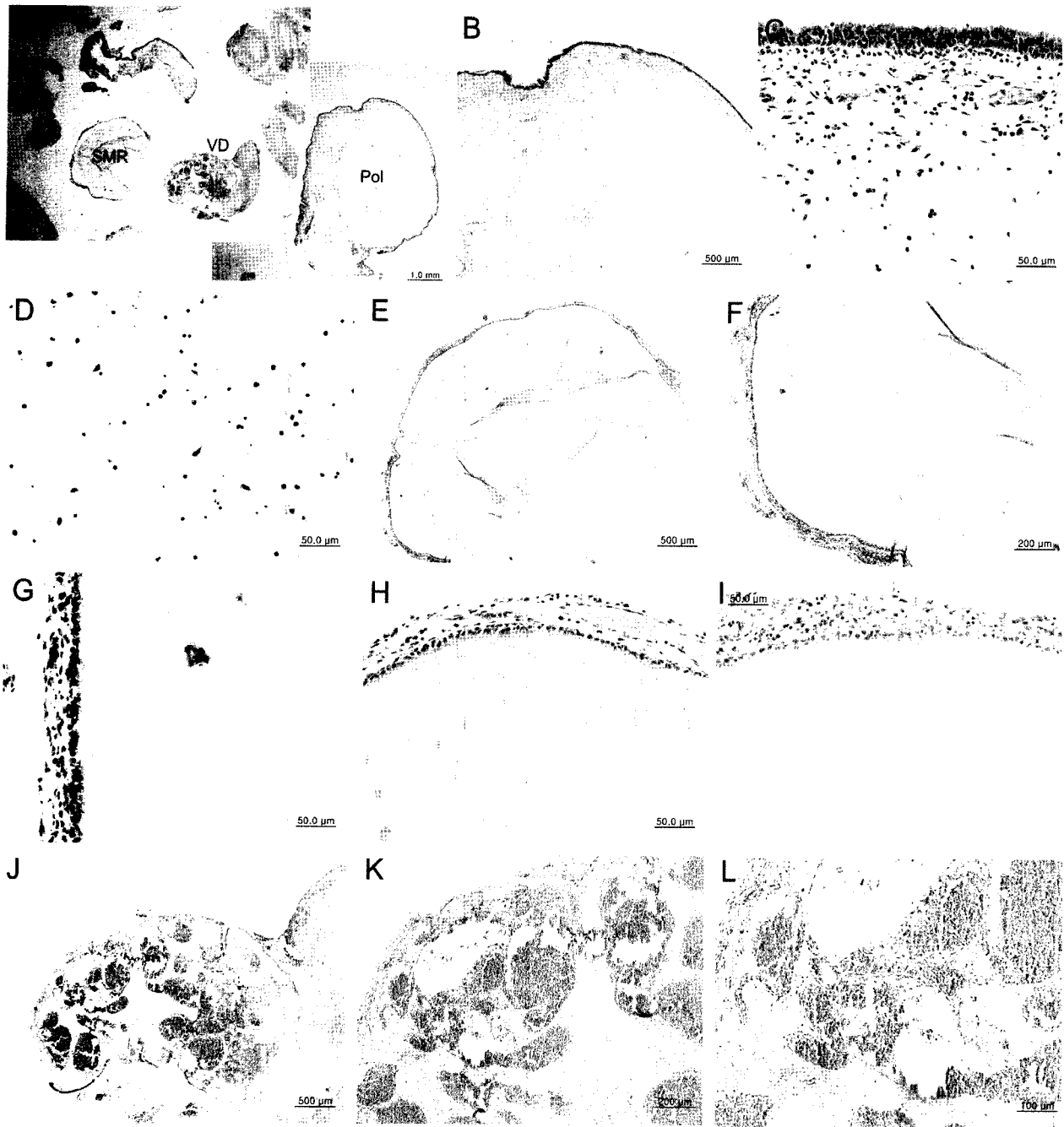
The current case presentation was aimed at microscopic evaluation of antral polyp and emphasis the differential diagnosis between chronic maxillary sinusitis of odontogenic origin and antral polyp of nasal origin with the reviews of literatures.

## II. CASE REPORT

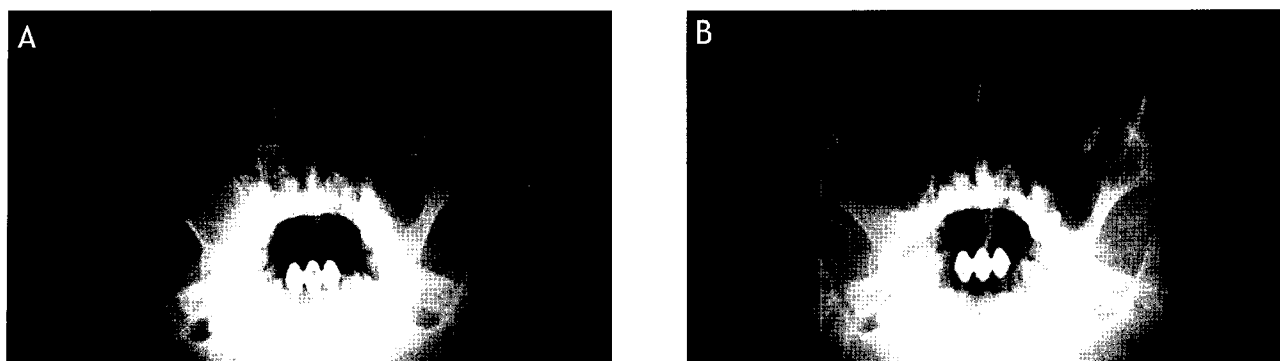
A 57 years old female was complaining of chronic dull pain in the right maxillary area. She had received an operation for maxillary sinusitis at the same site of the present lesion 7 years ago, and recently she felt nasal congestion and bad smelling from nasal passage. In the radiological observation of pantomogram and Water's view (Fig. 1), the radiopaque haziness of right antrum was minimal. The polypoid mass was found in the lower posterolateral wall of antrum, but not



**Fig. 1.** Radiological features at initial diagnosis. A: Pantomogram, the radiopaque haziness of right antrum was minimum. Note the absence of right upper premolar and molars by the extraction in the previous operation two months ago, and the patient has a history of functional endoscopic sinus surgery 5 years ago. B: Water's view, a polypoid mass (arrows) was found in the lower posterolateral wall of right antrum, which was not extended to the choanal area.



**Fig. 2.** Photomicrographs of the antral polyp. Measuring bar in each panel directly indicates the magnification. A : Low magnification of whole microsection. Note the polypoid mass (Pol), sacculus mucous retention (SMR), and hemorrhagic vascular dilatation (VD). B-D: Polypoid mass. B : Distended polyp with inner myxoid degeneration. C : High magnification showed the intense infiltration of neutrophile into the subepithelial area, and diffuse infiltration of plasma cells and macrophages into the deep connective tissue. D : High magnification of the myxoid lesion, note the sparse vasculature and diffuse infiltration of plasma cells but not eosinophiles. E-I: Saccular mucous retention lesion. E : the thin secular mucosa contained a big round mucoid material. F-G : High magnification showed mucoid retention by the active production of mucoid materials by the secretory mucosa cells. H : H&E stain. I : PAS stain. The mucoid materials were weakly positive for PAS reaction. J-L : Hemorrhagic vascular dilatation lesion, note the severe vascular dilatation with bloody congestion, but rare inflammatory cell infiltration around the vessels.



**Fig. 3.** Sequential postoperative Water's views. A: Postoperative 1 month, mucosal swelling was decreased around ostium and through the lateral wall of right maxillary sinus mucosal swelling was increased. B: Postoperative 4 months, linear radiopacity of soft tissue shadow was seen at the base of sinus cavity, which was not parallel to the ground level.

extended into the choana area. However, the whole right antrum was slightly expanded compared to the left antrum.

During the operation a good amount of mucinous material was discharged from the antrum with many fragments of soft mucosal tissues in grayish white color. The antral mucosa was relatively thin and well detached from the antral wall. The removed tissue showed a polypoid growth of antral mucosa in grayish white color admixed with bloody materials. In microscopic observation, the polyp was covered with a ciliated columnar epithelium partly exhibiting the squamous metaplasia, and was composed of a myxoid stromal connective tissues diffusely infiltrated with neutrophils and plasma cells (Fig. 2A, B). The inflammatory infiltration of neutrophils was usually localized at the subepithelial area, but eosinophiles were rarely detected (Fig. 2C). The underlying stromal tissue was much degenerative with diffuse infiltration of plasma cells and macrophages, and also showed a lot of dilated capillaries (Fig. 2D).

A portion of vascular congestion with the dilated vessels was found in the base of the polypoid tissues (Fig. 2J-L). However, the basal lamina of the dilated capillaries was continuous with the degenerative and myxoid stroma. There also appeared a portion of saccular mucosa containing a mucinous pool (Fig. 2E-G) which was weakly stained by PAS (periodic acid Schiff) stain (Fig. 2I). The

active secretion of mucoid materials was characteristic in the secretory mucosal epithelium of antrum, but no goblet cell was found. Additionally, the features of severe inflammatory infiltration of small round cells producing suppurative necrotic exudates and the thickening of the mucosa by stromal fibrosis, which were frequently seen in the chronic maxillary sinusitis, were not found in this case (Fig. 2).

The patient was hospitalized for 6 days, and antibiotics (Cefazolin sodium 1g : 3 times/day, Isepamicin sulfate 200mg : 3 times/day, Metronidazole 500mg twice/day) were continued postoperatively through intravenous injection. And after discharge, Augmentin® (Potassium clavulanate 125mg, Amoxicillin sodium 250mg) and 275mg naproxen sodium were administered 3 times per a day for 7 days, and after 7 days interval, same antibiotics and analgesics were continued for 21 days.

Water's views were taken at postoperatively 1 month and 4 months (Fig. 3). At the postoperative 1 month mucosal swelling around the right ostium was decreased, but mucosal swelling was seen around the lateral wall of right maxillary sinus. At the postoperative 4 months linear radiopaque line of soft tissue shadow was seen but this line was not parallel to the ground level.

After discharge, the patient was followed up on 6 times for more than 3 months. At 1 month postoperative, the patient complained nasal

bleeding of right side, and the oral examination showed the intraoral swelling of right buccal mucosa. Then, needle aspiration was performed and bloody exudate was discharged. 6 days later, the nasal bleeding was stopped.

There appeared no significant complain until 4 months of postoperation except the intermitent nasal discharge of exudate, which was stopped soon after.

### III. DISCUSSION

The present case showed the clinical features similar to the chronic maxillary sinusitis, so that the Caldwell-Luc operation had been done, and many soft myxomatous tissue fragments were removed from the antrum with a large amount of mucinous fluid. The microscopic sections of the myxomatous tissues revealed multiple polypoid tissues rather than the typical features of maxillary sinusitis. Although both of the antral polyp and maxillary sinusitis are all involved with chronic inflammatory reaction, the antral polyp is usually caused by different factors, i.e., allergy, vascular changes, systemic disorders, etc., which is conspicuously comparable to the maxillary sinusitis<sup>4,10,13</sup>. Consequently, the antral polyp is able to be recurred more frequently than the maxillary sinusitis<sup>12,14,15</sup>. Therefore, it would be necessary to distinguish the antral polyp from the maxillary sinusitis as clearly as possible to treat the disease in best.

In the present study, we diagnosed this lesion as an antral polyp rather than antrochoanal polyp which is frequently extended to the choana and nasopharynx, because this polyp was localized at the deep inner wall of antrum, lower posterolateral wall near the upper third molar. However, a lot of mucinous pooling was found in the clinical and pathological findings. Depend on the pooling of mucinous materials the pantomograms taken several times before the operation showed a variation of radiological haziness in the right antrum of the patient. Both of the pantomograms and Water's view showed no polypoid mass in the choanal area, and this finding was also confirmed during the operation. Therefore, we finally diagnosed the

present lesion as an antral polyp rather than an antrochoanal polyp.

Antrochoanal polyp can be defined as a soft tissue lesion originating from the maxillary sinus with the pedicle attached to the inner wall of the maxillary antrum, emerging from the natural of the accessory ostium and extending to the choana through the nasal cavity<sup>6,12,16,17</sup>. The antrochoanal polyp is supposed to be arisen from chronic inflammatory processes rather than allergic reaction<sup>16</sup>. As the complete removal of the polyp in the antrum is essential to minimize recurrence,<sup>18,19</sup> the Caldwell-Luc operation was regarded as necessary in the antrochoanal polyp, even in children<sup>20-22</sup>. The patient of the present case had received an operation for maxillary sinusitis 7 years ago with unidentified method, however, the antral polyp occurred with minimum inflammatory reaction. Actually in the nasal polyp it is known that two types of polyps, middle meatus polyp and antrochoanal polyp, should be distinguished each other due to the different pathogenesis and prognosis between them. Many middle meatus polyps were clinically related to the allergic episode and showed a lot of eosinophiles infiltrated into the myxoid polypoid tissue, while the antrochoanal polyp showed diffuse myxoid degeneration mainly infiltrated with neutrophiles and plasma cells in the lack of eosinophiles, and also showed the degeneration of vascular wall, resulted in the dilated vasculatures.

The present case showed the extensive myxoid degeneration in the stromal tissues of the antral polyp, mainly infiltrated with neutrophiles and plasma cells but not eosinophiles. The hemorrhagic vascular dilatation was also found in the base of the polypoid tissue, and in the center of the polypoid tissue there was only a few capillaries remained, which almost lost their integrity of basal lamina by the degenerative change continuous with the adjacent myxoid degeneration. From these findings, the present case basically belongs to the antrochoanal polyp, but its location is limited in the inner antral mucosa exclusively the choanal area. Thus, we finally diagnosed this case as an antral polyp.

Conclusively, we demonstrated a case of antral polyp which showed similar clinical features of chronic maxillary sinusitis. The antral polyp continuously induced the mucous retention in the right antrum, and produced the dull pain mimicking the chronic maxillary sinusitis. The antral polyp is basically different in its pathogenesis and prognosis from the common maxillary sinusitis, thus the antral polyp should be carefully diagnosed when the inflamed antral lesion is recurred and diffusely degenerative with myxoid change. And more, the mucosal status likely the antral polyp should be carefully considered in the case of the antral mucosa elevation technique for maxillary dental implant.

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