Case Report

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Abnormal Location of Natural Maxillary Sinus Ostium

Praneeth Potluri*, Saurabh Varshney, Manu Malhotra*****

Author Affiliation: *Junior Resident **Professor & Head ***Additional Professor, Department of Otorhinolaryngology & Head Neck Surgery, All India Institute of Medical Sciences, Rishikesh, Uttarakhand 249203, India.

Corresponding Author: Saurabh Varshney, Professor & Head, Department of E.N.T., All India Institute of Medical Sciences, Rishikesh, Uttarakhand 249203, India.
E-mail: drsaurabh68@gmail.com

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Abstract

The anatomy of maxillary ostium is highly variable in size, shape and position. The endoscopic sinus surgeons should have detailed knowledge about variations of maxillary sinus opening in any endoscopic sinus surgeries as it is closely related to the orbital floor above, sphenopalatine artery posteriorly and nasolacrimal duct anteriorly.

We report a case of abnormal location of natural maxillary sinus ostium at extreme posterior tip of infundibulum, which was identified during functional endoscopic sinus surgery and managed successfully.

Keywords: Maxillary sinus Ostium; sphenopalatine artery.

Introduction

Middle meatal antrostomy (MMA) is one of the important steps during functional endoscopic sinus surgery (FESS). The final outcome of surgery is directly related to patency of the maxillary sinus ostia especially in cases of nasal polyp. Identification of maxillary ostium is necessary for performing MMA. Normally, natural ostium of the maxillary sinus drains into the inferior aspect of the infundibulum at a 45-degree angle, and it is found just below the orbital floor in the medial wall of the sinus. It usually lies halfway between the anterior and posterior walls of the sinus 4cms higher from hard palate [1]. Wigand (1994) stated it to be just superior to the midportion of insertion of inferior turbinate (supraturbinal). Kennedy *et al.* found it at the junction of anterior one third and posterior two third of middle turbinate[2]

Here we report a rare case of bilateral nasal pan polyposis with abnormal opening of principle maxillary sinus ostium in extreme posterior tip of ethmoidal infundibulum in leftostio-meatal complex. The principal maxillary sinus ostium in rightostio-meatal complex was in thenormal anatomical position.

Case Report

A 18yrs old boy presented in outpatient department with the chief complaints of bilateral nasal obstruction (left > right) since 6 months, bilateral mucoid nasal discharge, scanty, non-foul smelling and intermittent dull aching pain in the left side of nose. There was no history of epistaxis, itching in nose, excessive sneezing, disturbances of smell, headache.

On anterior rhinoscopy, there was mild deviation of nasal septum to right, and pale polypoidal tissue seen in right middle meatus, arising from right ostiomeatal complex, and on left side, pale polypoidal tissue seen filling the entire nasal cavity, soft in consistency, not bleeding on touch. Nasal patency was decreased on both sides. There was no paranasal sinus tenderness. On posterior rhinoscopy, polypoidal tissue was seen in bilateral posterior

choanae. Anterior rhinoscopy and posterior rhinoscopy findings were confirmed by diagnostic nasal endoscopy (Figure 1 & 2)

Patient had no relief of symptoms with medical treatment for 6 months. A non-contrast computerised tomography (NCCT) of nose and paranasal sinuses was done which was suggestive of B/L panpolyposis. (Figure 3, 4 & 5).

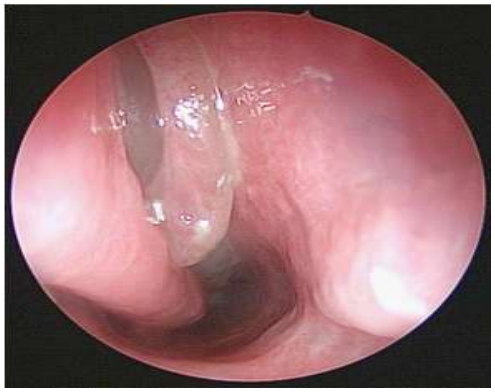

Fig. 1: Endoscopic view of right nasal cavity showing polypoidal tissue in the right ostiomeatal complex and DNS to right

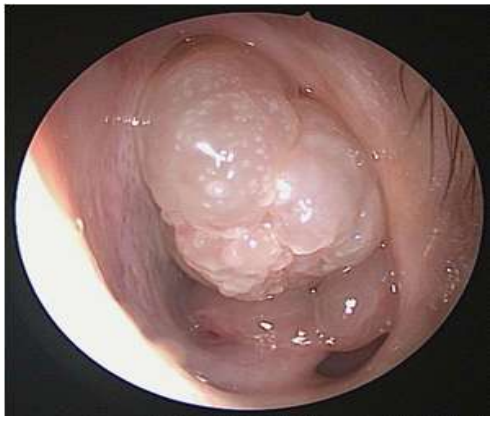

Fig. 2: Endoscopic view of left nasal cavity showing polypoidal tissue almost filling the entire nasal cavity

Fig. 3: NCCT nose and paranasal sinuses coronal view showing bilateral maxillary sinus, frontal sinus and anterior ethmoids haziness

Fig. 4: NCCT nose and paranasal sinuses axial view showing bilateral maxillary sinus haziness

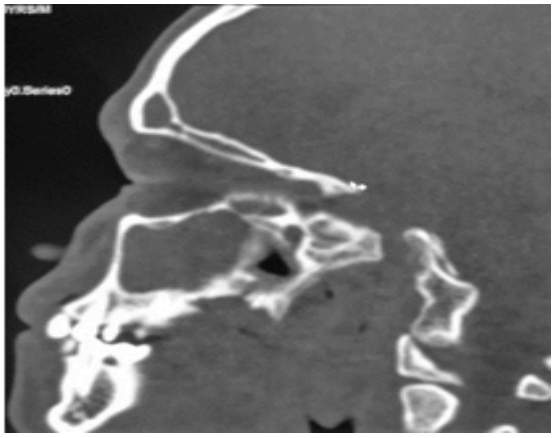

Fig. 5: NCCT nose and paranasal sinuses sagittal view showing maxillary sinus haziness

Patient was investigated and planned for FESS. During the FESS surgery, right side was uneventful. On left side, uncinectomy was performed and ethmoid bulla opened. The principle maxillary sinus ostiumcould not be identified in its normal location and wasidentified after rigorous effort, atextreme posterior tip of ethmoid infundibulum (Figure 6).

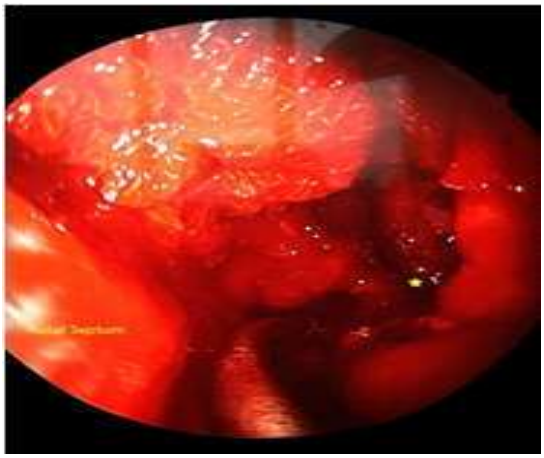

Fig. 6: Intra operative picture showing abnormal position of maxillary sinus opening

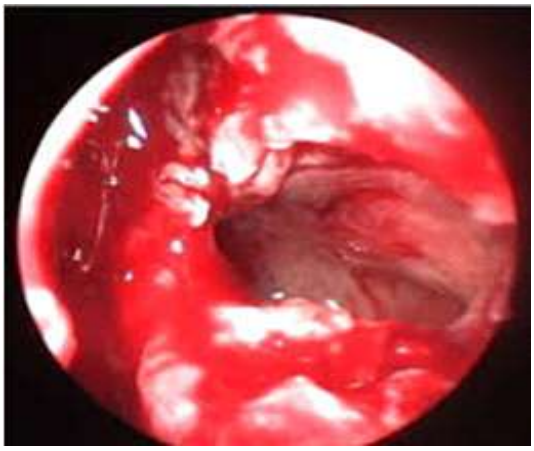

Fig. 7: Endoscopic picture showing abnormal position of maxillary sinus opening (3rdPost operative day)

MMA was performed which was followed by severe haemorrhage due to trauma to branch of sphenopalatine artery as the principle maxillary sinus ostium was located at posterior tip of ethmoid infundibulum. Haemostasis was attained using adrenaline packing and gel foam. Anterior ethmoidectomy, partial middle turbinate reduction and posterior ethmoidectomy was done, entire diseased polypoidal mucosa was removed. Conventional nasal packingwas done with soframycin soaked ribbon gauze. Pack was removed after 48hours, postoperative period was uneventful. (Figure 7) Patient was discharged on 3rd day of surgery and is under regular follow up.

Discussion

The anatomy of maxillary ostium is highly variable in size, shape and position. The primary maxillary ostium may be found at any point along the course of the ethmoid infundibulum. Van alyea reported the maxillary sinus ostia in the superior third of the infundibulum in 10%, the middle third in 25%, and the inferior third in 65% of cases [3]. Lang et al. (1982) divided ethmoidal infundibulum into four parts by drawing three lines at equal distances. Maxillary sinus ostium located in anterior division in 22% cases, second division in 28% cases, third division in 48% cases and posterior division in 2% cases [4]. Our case falls into the posterior division and hence was rare.

Locating the natural maxillary ostium is paramount to avoid false surgical ostium formation which can lead to mucociliary recirculation and failure of surgery [5]. Maxillary sinus ostium is clearly visible after performing uncinectomy. If maxillary ostia is not visualised, palpate the lateral wall of nose using maxillary cannula. Cannula should be passed along the superior attachment of inferior turbinate keeping the direction of cannula tip antero inferiorly. While doing this, cannula usually slips into and engages into the natural maxillary ostium. 30^0/ 70^0 endoscope is preferred to visualise the ostium [2].

In some cases of chronic rhinosinusitis, due to pathological inflammation, there will be closure of natural maxillary ostium [6] and accessory maxillary sinus ostium is seen in 30% of patients with chronic rhinosinusitis [7]. So, in cases where natural maxillary sinus ostium is not identified in normal position, accessory ostium needs to be ruled out. The rate of anatomical variations in nasal structures is reported to be between 64.9 and 80% [8].

Middle meatal antrostomycan be done in two ways. One way in posterior direction by resection of posterior fontanelle and another way isin anteroinferior direction by resection of anterior fontanelle. Sphenopalatine artery enters the lateral wall of nose through sphenopalatine foramen posterior to maxillary ostium. Excessive widening of ostium in posterior direction leads to injury to sphenopalatine artery or its branches. Especially in cases where the anatomical location of natural maxillary ostium is in posterior division of infundibulum, chances of injury to sphenopalatine artery or its branches are higher during MMA which happened in our case.

Conclusion

Although maxillary sinus ostium location in posterior division is rare, its identification is important both preoperatively and intraoperatively, because during MMA in these cases, chances of injury to sphenopalatine artery are high which can lead to severe bleeding.

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