



Nasal Septal Mucocele, Presenting as Nasal Midline Mass

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Abstract

Introduction: Pneumatization of paranasal sinuses has a variable course. The clinical significance of nasal septal pneumatization is still unknown. There are multiple reports of nasal septal pneumatization as an anatomical variation. But mucocele formation in these cells is a very rare finding. We have seen less than 10 reported cases in literature and here we present another patient with nasal obstruction and headache with this diagnosis.

Case Report: A 27 year old man referred us complaining of nasal obstruction and frontal headache years after septoplasty. A nasal septal mass was seen in exam and imaging. The cystic mass treated through endonasal approach.

Conclusion: Generally nasal obstruction, pain and septal mass are presenting symptoms and signs. An expansible fluid filled mass is seen in bony nasal septum in imaging. Transnasal endoscopic marsupialization is the treatment of choice.

Keywords: Nasal septum; Pneumatization; Mucocele; Marsupialization

Introduction

Mucoceles of sinonasal tract are relatively common findings [1]. Histologically they are benign lesions, but their gradual expansion can cause local destruction and injury of surrounding structures [2-4]. Presentation depends on anatomical site of origin and nearby structures. Clinically proptosis and displacement of the orbit are the most common presentations [5]. Nasal obstruction is a rare symptom and commonly is seen in maxillary sinus mucoceles [6]. A large mucocele produces a classic radiographic appearance of an enlarged, distorted sinus with a large bony defect representing a breakthrough into the adjacent structures. Not all mucoceles are classic, and there are many with subtle bone erosion. Bone remodeling, gradual pressure atrophy and erosion of the bone by the enlarging soft-tissue mass of mucocele, produces the expansile appearance on CT scanning [7]. Erosion of lamina papyracea, orbital rim and skull base are common CT findings in huge mucoceles [5]. Mucoceles are typically seen on MRI as hypointense or less frequently as hyperintense images on T1-weighted and hyperintense on T2-weighted MR scans. Because of variable protein content within long-standing mucoceles, signal intensity can be highly variable on both T1-weighted and T2-weighted MR sequences [7].

Fronto-ethmoidal mucoceles are the most common. Maxillary and sphenoid mucoceles is seen less commonly [2,3]. Mucocele of other areas of sino-nasal tract is very rare and recently mucocele of the nasal septum has been reported and we found less than 10 cases in literature.

Case Presentation

Our patient was a 27-year-old man complaining of nasal obstruction and frontal headache since four years ago. He had a history of previous septoplasty and turbinoplasty procedures 5 years ago because of septal nasal deviation and hypertrophy of inferior turbinates. After a period of improvement postsurgically, nasal obstruction gradually has returned. Past medical history was insignificant. Physical examination revealed slight septal deviation and septal-middle turbinate synechia. There was bulging in dorsal septum bilaterally. During endoscopic examination, a submucosal mass more prominent in left side was detected in anterosuperior septum, which had firm and bony consistency.

Paranasal sinus CT scan in axial and coronal views showed an expansile cystic mass with homogenous hypodense appearance lying in between bony septum and inferior skull base, below the nasal bones and eroding left nasal bone. The dimensions were 25 mm × 15 mm × 10 mm. Paranasal sinuses were clear. There was no crista galli pneumatization and we did not see any bony defect or erosion in other areas of skull base. In T1 and T2 weighted images, the mass was

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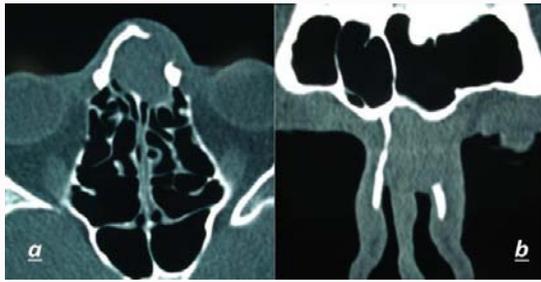


Figure 1: CT without contrast in axial (a) and coronal (b) views. There is an expansile mass in upper part of nasal septum with remodeling and bony defect in left side.

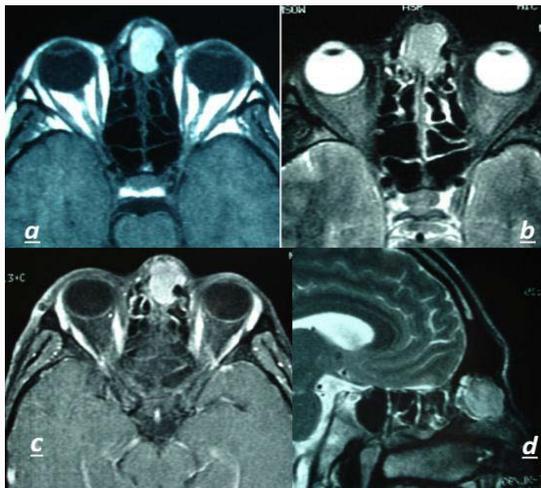


Figure 2: MRI of the patient: axial T1W (a), axial T2W (b), axial with contrast (c) and sagittal T2W (d) views of the lesion.

moderately hypersignal and hyposignal respectively and there was no enhancement after intravenous injection except than peripheral area. In MR examination, we did not find intracranial communication (Figures 1-3).

Based on clinical and especially imaging findings we could rule out some important differential diagnoses such as neoplasm, polyp, fungal infections or intracranial connection and we went for surgical exploration for correction of airway and establishment of final diagnosis.

Endoscopic approach was chosen for surgery. Under general anesthesia, on the left side of the septum, mucosa was incised on the antero-inferior border of the mass and a posteriorly based mucosal flap was elevated. The bone of the anterosuperior part of the septum



Figure 3: Views of coronal MRI in T1W (a), T2W (b) images and after IV contrast (c). There is no increased enhancement of lesion after contrast injection. Peripheral enhancement is evident (image c).

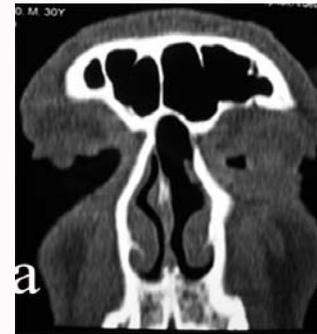


Figure 4: Postoperative view of mucocele cavity. The space, which previously was occupied by the mass, is now clear and pneumatized, connecting with the left side of the nasal cavity.

was so thin; it fractured with slight freer elevator pressure. A white thick fluid expelled which was sent for culture. The cavity was large and covered by mucosa with no septation or solid mass while inspecting by 70-degree endoscope. Left nasal bone seemed eroded and by pressing the left nasal bone externally, the movement could be detected internally. The cavity was irrigated. Left bony wall of cavity was removed completely. After trimming septal mucosal flap, the cavity marsupialized to the nasal space. Histologic examination revealed respiratory mucosa with chronic inflammatory infiltration. Culture result was negative. Retrospectively, our patient was a case of perpendicular plate mucocele in anterosuperior part of nose. Our patient's complaints were improved after surgery. CT scan showed the cavity connecting to nasal space completely, fully pneumatized and no signs of recurrence, 6 months postoperatively and the previously eroded bone seemed to begin ossification (Figure 4). After 2 years, he had no symptoms and mucocele cavity was connected freely to the nasal space in endoscopic examination.

Discussion

Pneumatization of paranasal sinuses has variable course; it may extend sinus borders into pterygoid plates, crista galli, uncinate process, middle turbinate, nasal bony septum and greater wing of sphenoid [8,9]. The Pneumatization has two stages. During primary pneumatization stage, ethmoid cells invade frontal, maxillary and ethmoid bones. In secondary pneumatization, these epithelialized structures extend through adjacent bony structures, which happen mainly in postnatal growth [10].

In recent years, because of extensive use of CT examination of sinonasal system and increasing familiarity with anatomical details of this area, interest in evaluation of clinical significance of extra-sinus pneumatization has increased. In this background, there is

little information about nasal septal pneumatization and its clinical significance in English references. In most articles, pneumatization of nasal septum has been considered as an anatomical variant in sinus and nose anatomy. This finding has a different prevalence from 0.5% to 18%. Lang stated that septal pneumatization is not common and it may occur through frontal sinus and is accompanied by crista galli pneumatization. Krmpotic-Nemanic has reported septate septal sinus. He showed that sometimes sphenoid could project into septum. Schwartz detected septal sinus in 2% of cases in his radiologic study [11]. Due to Chao the incidence of septal pneumatization in patients with sinusitis is 2% [8], while Lei reported it to be 18% and it may affect anterior or posterior part of perpendicular plate [9]. In contrast to pneumatization of nasal septum, septal mucocele is a very rare finding. We found only 7 reported cases in literature search and present patient is the eighth. Gall and Witterick presented a case report of bilateral nasal obstruction and midline nasal mass whom had undergone surgery 20 years to 30 years ago and they marsupialized it endoscopically as a septal mucocele in 2002 [12]. This was the first report of septal mucocele. The authors believed that mucocele formation was traumatic in origin due to sequestration of mucosa in septum after first surgery. Herman and Jahnke reported a case of left facial pain and a septal mass [13]. In 2004 Lei et al., reported a 32-year-old patient with progressive septal mass, underwent endoscopic surgery [9]. They related mucocele formation to obstructed pneumatization of nasal septum. Aynali et al. reported a giant septal mucocele in a patient with rhinoplasty history [14]. Safavi Naini reported a case of septal mucocele without history of surgery [15]. Hong et al. reported a case of septal mucocele treated endoscopically [16]. Huang et al. evaluated the incidence of nasal septal cellulitis in CT, which was 19 out of 173. In all of these cases the cellulitis was in the ethmoid bone located in upper part in 8 and in middle part of septum in the rest. Septal mucocele was present just in one [17]. Considering epithelial coverage of the cavity, it is probable that its mucosa is involved in sinonasal pathologies especially inflammatory processes. Theoretically epithelium of this cavity can be a source for benign or malignant tumors.

Mucocele is an epithelial-lined, mucus-containing sac completely filling sinus cavity and is capable of expansion. Frontal and fronto-ethmoid areas are the most common places, which is probably due to complexity of drainage in these regions. Other less common sites are: sphenoid and maxillary sinuses. Particular comorbidities were reported with mucocele: chronic rhinosinusitis, sinonasal trauma, polyposis, cystic fibrosis, granulomatous diseases and osteoma [18]. In one study 38.6% of mucocele cases had previous history of sinus surgery [19]. Patients with history of sinus surgery have increased susceptibility for mucocele formation.

In some cases, mucocele has been reported in association with tumors of sino-nasal tract, so in every case of mucocele, tumor should be ruled out. MRI with IV contrast is useful in this way and is recommended for diagnosis of solid components [3].

Our patient had complained of nasal obstruction since long time ago. So if we imagine that septal pneumatization is an evolutionary process, obstruction of the ostium of this cell may be due to prolonged nasal mucosal inflammation or iatrogenic, secondary to surgical procedure. These two factors are among important causes of mucocele formation. Since the appearance of mucocele is due to obstruction of the orifice accompanied by inflammation, there may be a time lag between effect of these factors and beginning of

symptoms [18]. We think septal mucocele is related to obstruction of septal pneumatization because of trauma or in an inflammatory background and consequently enlarges as an expansile mass in the bone in contrast to nasal septal cyst that is a rare complication of septoplasty because of entrapment of nasal mucosa in submucosal space [20]. It seems that mucosal sequestration in nasal septum is not an acceptable explanation for evolving mucocele in a bony cavity as in our case. Septal mucocele must be differentiated from some midline nasal cystic masses such as encephalocele, meningocele, epidermoid, dermoid, septal abscess and finally nasal septal cyst. Classically in T1 weighted MR, mucocele presents as a hypointense mass which is hypersignal in T2 weighted MR. Though as our case, these views may change according to water and protein content of the mucocele (increasing signal in T1 if protein is dominant) [21]. Van Tassel and colleagues reported two basic MRI patterns of mucocele in their study: either moderate to marked hypointensity in T1 and T2 weighted images or moderate to marked signal hyperintensity on T1 and T2 weighted images that correlate with inspissated or hydrated content respectively.

The most efficacious way of treatment is creating a large communication between mucocele cavity and nasal space as in other mucoceles [19]. It is probable that some part of bony erosion could be reversible as in our case, which postoperative CT shows ossification in left nasal bone.

Conclusion

Nasal septal mucocele is a rarely reported entity. We found 7 cases in literature and it seems that our case is the eighth reported case. Obstructive symptoms and pain are common presentations. It should be considered in differential diagnosis of midline nasal masses. Endoscopic marsupialization is the treatment of choice.

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