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Cholesterol Granuloma of Maxillary Sinus: A Case Report

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Abstract:
Cholesterol granuloma(CG) are benign cysts formed as a result of inflammatory reaction to cholesterol crystals deposition. It is commonly found in the mastoid antrum and the air cells of the middle ear, but is very rarely seen in paranasal sinuses. This report presents a case of cholesterol granuloma that developed in the right maxillary sinus. Maxillary sinus CG mimics symptoms and signs of chronic sinusitis and maxillary sinus mucocoeles, which cannot be clinically and radiologically distinguished. Our case was treated with endoscopic endonasal resection and the diagnosis was confirmed on histopathological examination. This report provides insight for the diagnosis and treatment of a case of maxillary sinus cholesterol granuloma.
Key Word*: Cholesterol granuloma; Maxillary sinus; Cholesterol crystals; Chronic sinusitis; Maxillary sinus mucocoele.*

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I. Introduction

Cholesterol granuloma (CG) is an inflammatory immune response to cholesterol deposits left by the breakdown of blood vessels and cells that have been precipitated in tissues. They are benign cysts, that develops in the central skull base and is commonly seen in the mastoid antrum and air cells of the temporal bone. It presents as an expanding mass containing fluids, and cholesterol crystals, surrounded by a fibrous connective tissue capsule with fragile blood vessels which are prone to rupture[1]. Sinonasal CG clinically mimics a cystic mass or an inflammatory disease because of it non specific clinical features. Cholesterol granuloma of paranasal sinuses is a rare entity with only less than 200 cases reported worldwide.[2,3,4] . Here, we present a case of Cholesterol granuloma of the maxillary sinus.

II. Case Report

A 29 year old female presented to our hospital with complaint of right sided facial pain and headache of 1 year duration. She had no associated nasal discharge, nasal obstruction, epistaxis, facial numbness and had no other comorbidities. There was no history of any facial trauma, dental procedures in the past. Anterior rhinoscopy was essentially normal. Nasal endoscopy showed a bluish mass bulging through the posterior fontanelle on right side.

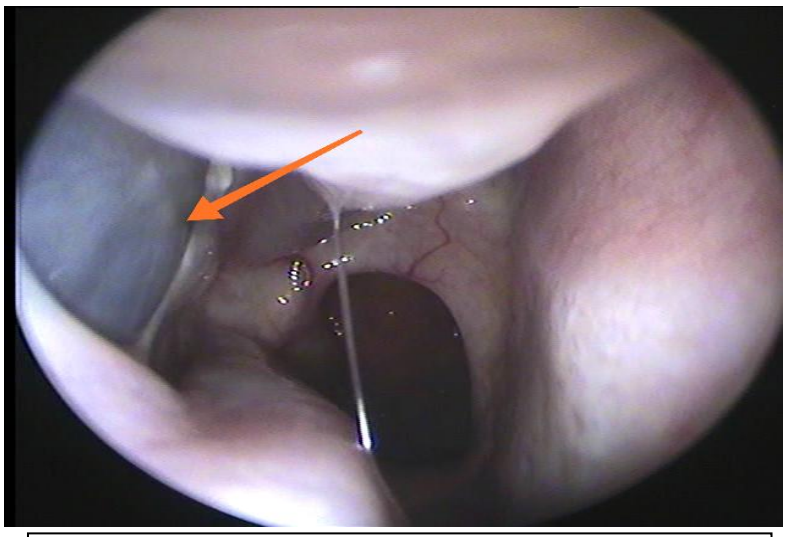

Fig 1 : Mass seen bulging from right maxillary ostium on DNE

A non contrast CT of brain and paranasal sinuses revealed homogenous soft tissue density filling the maxillary sinus on right side, with mild displacement the medial wall and uncinate process medially. No evidence of any bony erosion, sclerosis or intracranial extension were noted.

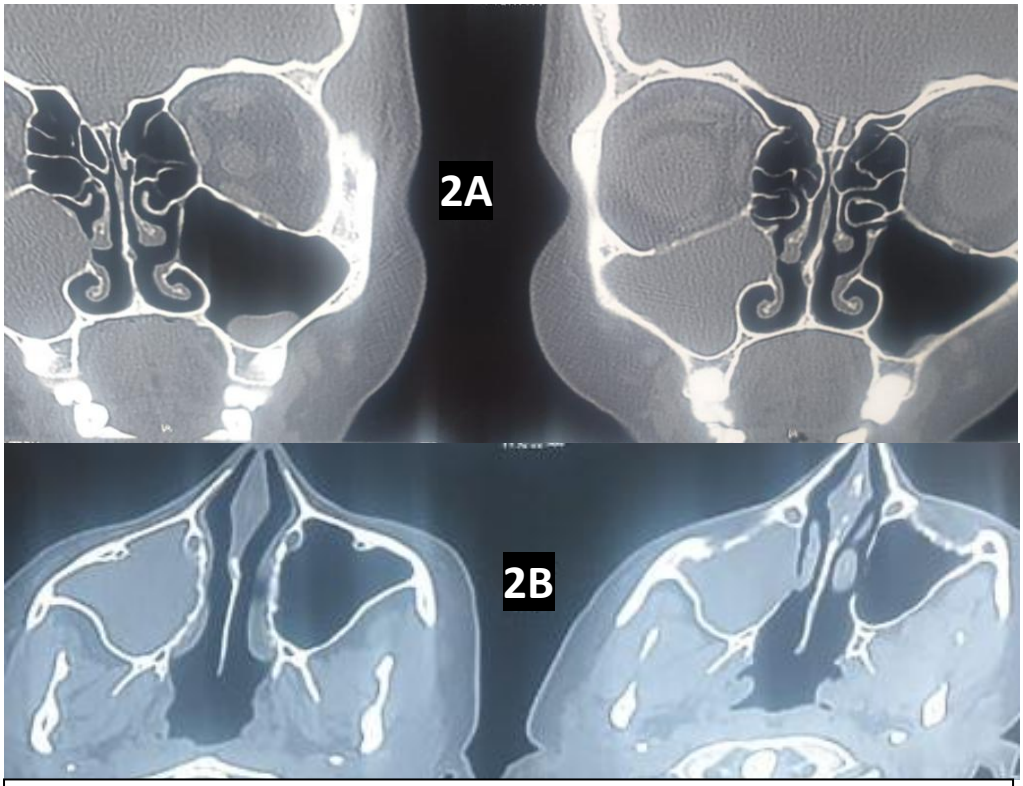

Fig 2: CT-Coronal view (2A) and Axial view (2B) : showing well-marginated, expansile, soft tissue density in the right maxillary sinus passing through a widened maxillary sinus ostium

The patient underwent endoscopic resection of the cystic mass from the right maxillary antrum under general anaesthesia. Glistening clear fluid was noted within the cyst She had an uneventful postoperative period.

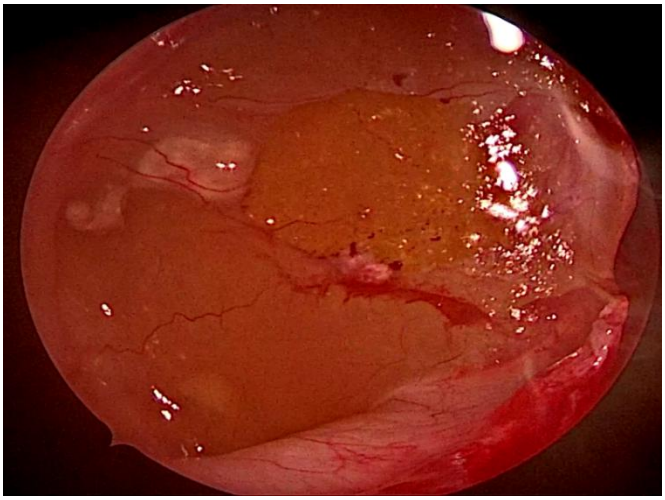

Fig 3: Intra operative picture of glistening clear fluid within the cyst

Histopathological examination reported respiratory epithelial lining with subepithelial region showing multiple cystic spaces filled with cholesterol clefts surrounded by multinucleated giant cells and foamy histiocytes compatible with cholesterol granuloma

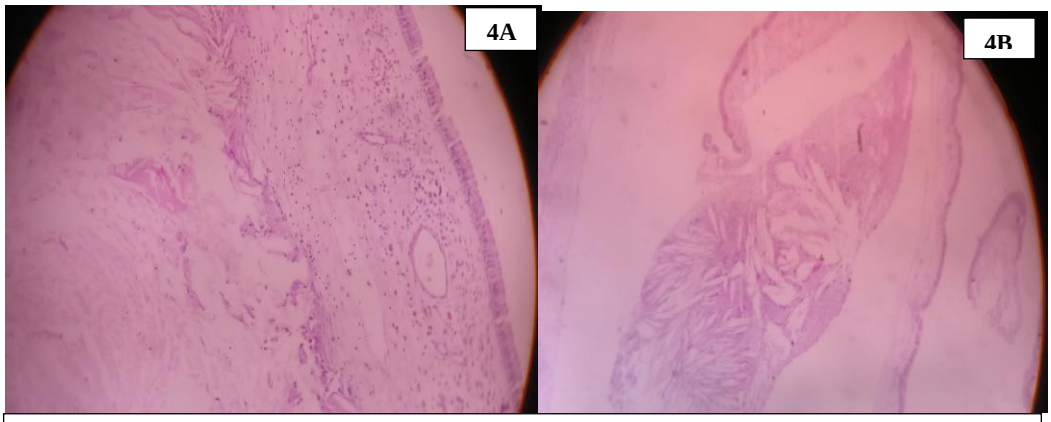

Fig 4(A &B): Respiratory epithelial, cystic spaces with cholesterol clefts, giant cells and macrophages: seen on Histological examination

III. Discussion

Cholesterol granuloma are benign cystic lesion, that arise as a result of inflammatory giant cell reaction to cholesterol crystals that are formed when normal aeration and drainage of an air cell become occluded. CG was first described in the peritoneum in 1893 and has there after been reported in numerous locations including the mastoid bone, middle ear cavity, petrous apex, paranasal sinuses, orbitofrontal bone,and petroclival region[4,5,6]. The pathogenesis of maxillary sinus CG is still unclear and its occurrence has been reported secondarily to bleeding, inadequate lymphatic drainage, poor ventilation, trauma, surgery, sinusitis, and odontogenic lesions[7]. It has conventionally been explained by the 'Obstruction–vacuum' and 'Exposed marrow' hypotheses[5]. Obstruction-vacuum theory is a hypothesis that explains the development of cholesterol granulomas of the petrous apex and paranasal sinus. The mucosal swelling can create ventilation obstruction and air trapping. The then generated negative pressure may cause extravasation of transudate and blood [8]. Hematoma thus formed from the mucosal bleeding would not be absorbed, resulting in its conversion to cholesterol crystals. The deposited cholesterol crystals act as an irritant which attracts foreign body giant cells and causes fibrosis [9]

Cholesterol granuloma of the maxillary sinus symptomatically mimics chronic sinusitis. The common presenting symptoms are nasal obstruction, headache, facial pain and pain surrounding the eyes[10].

CT and MRI remains the investigation of choice. Maxillary sinus CG CT typically shows an expansile well-marginated, homogenous lesion with thinned out overlying bone, especially medial wall. This may be dehiscent when the lesion is large[11]. MRI scan helps differentiate it from mucocoeles. T1 and T2 weighted images in CG shows hyperperintense signal due to cholesterol component and methemoglobin with occasional hypointense rim due to hemosiderin, and thinned adjacent bone, whereas T1 images in mucocoele shows hypointense signal.[11,12]

Differential diagnosis of cholesterol granuloma should include allergic and inflammatory sinusoidal diseases, mucoceles, pyomucoceles,and sinusoidal odontogenic and non- odontogenic cysts and tumors[13]. Definitive clinical diagnosis is difficult, and it is confirmed over histopathological exam.

Histologically, cholesterol granulomas are composed of yellowish-brownish fluid which contains cholesterol crystals, multinucleated giant cells, red blood cells and blood breakdown products, hemosiderin. This is surrounded by a fibrous connective tissue capsule with fragile blood vessels which are prone to rupture, thus preventing resolution [14].

Endoscopic Sinus Surgery is the mainstay treatment for maxillary sinus CG. The use of endoscopic techniques for this disease was first described by Marks and Smith[14] in 1995. Complete excision of cyst is possible via extended middle meatus antrostomy using angled telescope and giraffe forceps. Cadwell-Luc approach is also an alternative technique[15]. Prognosis of paranasal sinus CG is good and recurrences are rare with effective treatment[10].

IV. Conclusion

Cholesterol granuloma of maxillary sinus are rare. Definitive diagnosis of CG is obtained only on histopathological examination, as the clinical and radiological findings mimic chronic sinusitis. Complete excision of cyst through wide endoscopic middle meatal antrostomy is the treatment of choice.

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