Maxillary Antrolith: A Probable Cause of Chronic Sinusitis – A Case Report and Review

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Abstract
Maxillary Antrolith is a rarely found calcified mass that occurs in the maxillary sinus formed by exogenous or endogenous origin. Stones arising in the antral cavities are uncommon, and their development is similar to that of a sialolith. We report a case of 55 yr. old male who came with h/o heaviness on right cheek region, nasal discharge and headache since 1 month. On evaluating the PNS radiograph shows the radiopacity in the right maxillary sinus. Caldwell-Luc operation was done and the calcified masses (antroliths) along with antral polyps were removed. We report this case because of its rarity. The etiology, clinical and radiographic aspects and differential diagnosis of antrolith are also discussed.

Keywords: Antral polyps, antrolith, Caldwell-Luc operation, maxillary sinus, sinusitis

INTRODUCTION
Maxillary antrolith is a rarely found calcified mass that occurs in the maxillary sinus formed by exogenous or endogenous origin. Stones arising in the antral cavities are uncommon. Their development is similar to that of a sialolith as these may form around a nidus or concentrated mucus, which continues to grow because of the precipitation of calcium salts in concentric layers. The origin of the nidus of calcification may be extrinsic (foreign body in sinus) or intrinsic (stagnant mucus and fungal ball).[1,2]

Smaller antroliths are usually asymptomatic and may be discovered incidentally on routine radiography of the region. Larger ones may present as sinusitis with symptoms such as pain and discharge. This article presents a case of the patient with acute sinusitis with nasal discharge and heaviness on the right side of the face, in which the maxillary antroliths along with antral polyps are recovered during Caldwell-Luc operation.[3,4]

CASE REPORT
A 55-year-old male patient reported with heaviness on the right side of the face, nasal discharge, and foul smell during breathing for 2 months. The family and personal history was not significant. His general physical examination appeared normal without any obvious deformities or abnormalities. Oral cavity examination revealed the presence of a grossly decayed upper 2nd molar tooth on the right side. A decayed tooth was removed, and the closure of the socket was done with the help of buccal advancement flap.

After 1 month, the patient again visited us with the same complaint of heaviness on the right side of the face along with nasal discharge and headache.

On radiological examination, the X-ray paranasal sinus (PNS), Waters’ view [Figure 1] showed haziness of the right maxillary sinus. PNS revealed soft-tissue density in the right maxillary sinus. The provisional diagnosis of right-sided maxillary sinusitis was made. The patient was managed with parenteral antibiotics and planned for Caldwell-Luc operation.

All the hematological and biochemical investigations were within normal range.

Caldwell-Luc operation was done, and the multiple 4–5 small calculi (each around 0.7 mm × 0.3 mm in dimensions) were recovered along with antral polyps during Caldwell-Luc operation.

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removed along with the antral polyps [Figure 2] from the right maxillary sinus and were sent for histopathological examination, which reveals it antrolith and polyp.

The patient was started on intravenous cefuroxime 750 mg intravenous for 5 days twice a day, first dose being at the time of induction. The patient recovered in the postoperative period uneventfully.

The total of 4–5 calcareous masses which were removed from the sinus were irregular in shape and freely lying in the sinus along with the polyps and were not attached to any wall of the maxillary sinus. Thus, we concluded it to be a sinolith/rhinolith in the right maxillary sinus, rephrased as an antrolith.

**DISCUSSION**

Antroliths are uncommon calcified masses found in the maxillary antrum. These mineralized bodies have been variously described as rhinoliths, antral rhinoliths, antral stones, antral calculi, antroliths, sinoliths, maxillary sinus stones, and antrorhinoliths. The term “maxillary antrolith” was introduced by Bowerman in 1969 to facilitate their classification and description that calculi found within the maxillary sinuses.[2,4]

The pathogenesis of stone formation within a PNS is not fully understood. A maxillary antrolith is the result of complete or partial encrustation of an antral foreign body usually of endogenous but occasionally of exogenous origin. If the central core arises around body tissues, it is of endogenous origin and called true type. Tooth and tooth root, bone fragments, sequestra, dried blood clots, pus, mucus, and fungi are considered endogenous. On the other hand, if the central core originates outside the body, it is of exogenous origin and classified as false type. Exogenous nidus includes cotton cellulose, paper, bead, button, vegetable/bean pieces, fruit seeds or snuff, dental burs, dental implants, gutta-percha points, and silver points. More bizarre foreign bodies include bullets, pieces of glass, stones, wood, grasses, matchsticks, sand, and a living leech.

Ogata et al. suggested invasion of Aspergillus through the fistula after extraction of a molar tooth to be a trigger for an endogenous nucleus in the formation of antrolith.[5] Guneri et al. proposed that during the endodontic therapy, extrusion of calcium hydroxide into the periapical area may play a potential role in the development of calcified tissues within the antrum. [8] However, any material in the maxillary antra can act as a potential nucleus for the deposition of salts.[9,10]

Patients with antrolith may be asymptomatic and may be incidentally discovered on routine radiological examination. However, the majority of patients with maxillary antroliths in the literature have symptoms or clinical signs that may include pain, nasal stuffiness and obstruction, epistaxis, postnasal drip, heaviness and tenderness over the involved sinus and oroantral fistula, foul-smelling discharge, facial pain, and sinusitis.[1,5,11]

Radiographically, a dense, irregular yet well-defined mass can be identified in the antrum. They can be seen on panoramic, periapical, and Waters’ radiographs in addition to computed tomograms. They may vary in size, density, and outline. Their consistency varies from homogenous or heterogeneous density and sometimes showing alternating laminations of radiolucent and radiopaque material.[2,4,12]

Antroliths must be included in the differential diagnosis of radiopacities found in or near the maxillary sinus region. Other possible diagnoses can be supernumerary tooth, root fragments, osteoma, complex odontoma, mature cementoma, a periapical condensing osteitis, a buccal exostosis, a palatine torus, an impacted tooth, foreign bodies, and even neoplasms in cases of large calcified masses of the antral area.[9,13]

Histologically, antroliths usually show concentric rings like those seen in stones found in other parts of the body. Chemical analyses show that these calculi contain various amounts of calcium phosphate, calcium carbonate, calcium oxalate, albuminous material, magnesium phosphate, organic matter, and water. The consistency varies from hard and friable to soft, porous, or crumbly. Stones are frequently covered with granulation tissue with a rich blood supply. Color varies from black to gray, brown, or white.[2,5,14]
Normally, the mucus in the sinus plays a protective part preventing calcium salts from aggregating, but in the presence of inflammation, the ciliary clearance is affected causing stasis of secretion allowing calcium salts to be deposited around a nucleus. The management of antrolith should include surgical removal of stone by Caldwell-Luc operation or with an endoscopic sinus surgery, along with appropriate treatment of associated conditions.[5,13]

**Conclusion**

Antrolith in the maxillary sinus is still a rare entity and is a cause of associated sinusitis with nasal discharge along with heaviness over facial region. Although rare, antrolith should be considered as a differential diagnosis of radiopacity in the PNS lesion. The diagnosis was made by means of PNS radiographs, nasal endoscopy, and computed tomography scanning. Stone can be removed either by an endoscopic approach or with Caldwell-Luc operation using either local or general anesthesia. Caldwell-Luc operation is a reliable procedure for the removal of a large antrolith in the maxillary sinus as it provides better exposure, ventilation, and drainage of the sinuses.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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