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MANAGEMENT OF MAXILLARY SINUS MUCOUS RETENTION CYCT, A CLINICAL REPORT

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ABSTRACT
Mucous retention cyst of the maxillary sinus is a benign pathologic lesion. Most of the cases appeared asymptomatic and discovered accidentally during radiographic examinations. However, some cases present with symptoms such as; dizziness, headache, congestion, allergy, and paresthesia.
The aim of this report was to present successful conservative surgical management of a large maxillary mucous retention cyst associated with a deep pocket of a non-vital maxillary right second molar. **Case report** A 38-year-old male patient presented to the dental clinic with dull pain and suppuration around tooth #17. Clinical and radiographic examinations demonstrated generalized plaque and calculus deposits, BOP, gingival recession, and a large radiographic cystic area apical and lateral to tooth #17. A deep pocket, (PD) 15mm, was noted on #17 mesio-buccal, at this site there was suppuration, BOP, and grade II mobility. A vitality test indicated that the tooth was non-vital and symptomatic upon percussion. Following the extraction of the infected tooth, an excisional biopsy of the cystic lesion was performed. Histopathological examination confirmed the diagnosis of a mucous retention cyst. Case management involved extraction of the infected tooth, socket degranulation, and cyst enucleation. The sinus cavity was packed with gauze impregnated with bismuth subnitrate iodoform paraffin paste (BIPP). Uneventful rapid healing was observed. A cone-beam computed tomography (CBCT) scan obtained 1 year postoperatively demonstrated complete resolution of the cystic cavity. Clinically, complete soft tissue healing was evident. **Conclusion** This case highlights the successful management of a mucous retention cyst using a combination of extraction, cyst enucleation, and BIPP packing, with 12 months of follow-up showing stable results.

Key words: Maxillary sinus, Mucous retention cyst, Enucleation, Periodontitis.

INTRODUCTION
A mucous retention cyst of the maxillary sinus (MRCMS) is a benign, self-limiting lesion resulting from the leakage of mucus within the sinus mucosa due to ductal obstruction of seromucous glands [1]. The maxillary sinus is lined by a bilaminar membrane known as the Schneiderian membrane, which consists of periosteum overlying the bone and a lining of ciliated squamous epithelium responsible for removing sinus secretions [2]. Several cystic lesions can affect the maxillary sinuses, including mucous retention cysts, mucoceles, polyps, and pseudocysts [3,4]. Among these, MRCMS is the most common lesion, developing due to obstruction of the duct of a seromucous gland within the sinus mucosa [1]. This obstruction leads to the accumulation of mucus and subsequent cyst formation. The prevalence of MRCMS ranges from 1.4% to 9.6% of all sinuses [5-7]. The pathogenesis and etiology of MRCMS remain poorly understood. Proposed etiological factors include trauma, periapical and periodontal infections, [8,9] allergic and inflammatory processes of the nasal sinus mucosa,[10] chronic sinusitis, and environmental factors such as humidity [11]. Radiographically, MRCMS is usually identified as a dome-shaped, radiolucent, well-defined lesion of variable dimensions. It may be unilateral or bilateral, frequently located on the floor of the maxillary sinus, without causing damage to the sinus walls [12]. Most MRCMSs

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are asymptomatic and require no treatment. However, symptomatic cases may present with clinical signs and symptoms such as headache, fatigue, nasal obstruction, facial pain over the sinus region, postnasal drip, and nasal discharge [13]. The natural history of MRCMS varies, with lesions potentially undergoing spontaneous regression, remaining unchanged, or increasing in size [8,14,15]. Traditionally, treatment options included puncture and aspiration through the inferior meatus (located between the inferior nasal concha and the lateral nasal wall) or surgical removal via the Caldwell–Luc operation [11]. Currently, modern approaches such as endoscopic middle meatus antrostomy (MMA) and inferior meatus antrostomy (IMA) are preferred for the management of retention cysts of the maxillary sinus [16].

CASE REPORT

A 38-year-old Caucasian male patient presented to dental specialist clinic with a chief complaint ‘‘I feel pus coming out of my upper right tooth, and it started two months ago”. The patient had no systemic disease or significant medical history apart from seasonal allergy. His chief complaint was a dull aching pain upon mastication that began two months prior. His past dental history consisted of several extractions, scaling and root planing, and some restorations. An extra-oral examination showed facial symmetry with no swelling or abnormalities. A comprehensive periodontal evaluation revealed missing teeth (#’s 16, 36, 47), average probing depths were 3-5 mm, poor oral hygiene, generalized calculus and plaque accumulation, bleeding on probing, and gingival recession at several sites. The maxillary right second molar had a deep probing depth of 15 mm on the mesio-buccal; it was suppurating, bleeding on probing and manifested grade II mobility. Vitality tests indicated the tooth was non vital and it was symptomatic upon percussion. The panoramic radiography and cone-beam computed tomography revealed a well-defined, radiopaque, thick solitary lesion with dimension 30x30x20 mm in the maxillary right sinus and it extended through an opening of the alveolar ridge into the oral cavity mesial to the second molar (Fig.1). The provisional diagnosis was a mucocele. The differential clinical diagnosis includes localized periodontitis, acute periodontal abscess, polyps and lateral periodontal cyst. The final diagnosis was a mucous retention cyst of right maxillary sinus.

Figure 1. (A) Panoramic view from pre-operative CBCT. (B) Close-up view

Clinical Outcomes

Surgical intervention

The treatment plan was decided complete enucleation and open packing with bismuth iodoform paraffin paste (BIPP). Surgery was performed under local anesthesia using 4% articaine with, 1:100,000 adrenaline (Septodont Saint-Maur-des-Fosses Cedex, France). It involved extraction of #17. Aspiration of the cystic area was performed with a disposable sterile 20-ml syringe and a 15-G needle and revealed a mucinous gel content with citrine yellow coloration (Fig. 2). An excisional biopsy of the lesion was performed. Enucleation of the cyst occupying the right maxillary sinus and curettage of the surrounding granulomatous tissue was completed. An oroantral communication was seen at the time of surgery

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as the cyst had displaced the floor of the sinus vertically and circumferentially. The enucleated cystic cavity was packed with (BIPP) impregnated gauze (Aurum Pharmaceuticals LTD, Rumford, Essex, UK) to act as a surgical dressing and promote healing of the exposed bone (Fig. 3). The BIPP pack was removed after 4 weeks and it was noted that the bony walls of the residual cavity had started granulating in with connective tissue. The large residual cavity (30x 30 mm) communicated with the oral cavity via the extraction socket. The patient was given a 20 ml syringe and a blunt 15-G needle and advised to irrigate the cavity with normal saline after every meal. One dose of Augmentin (875 mg), 600 mg ibuprofen and decongestant were prescribed. Uneventful healing was observed following BIPP use. At postoperative follow-ups at 3, 6, and 12 months, the surgical site exhibited complete soft tissue healing. A CBCT at 12 months confirmed eradication of the cystic cavity and complete bone fill (Figs 4, 7, 8).

Histopathological finding

Histopathological examination of the biopsy specimen revealed a cystic cavity lined by ciliated pseudostratified columnar epithelium. The underlying connective tissue was loose, rich in delicate blood vessels, and contained focal areas of intense mononuclear inflammatory infiltrate. The cyst demonstrated features of chronic inflammation, including mucin spillage, calcification, fibrosis, and ulceration of the epithelial lining, accompanied by granulation tissue. The findings confirmed an inflamed benign maxillary sinus epithelial cyst, consistent with a long-standing mucous retention cyst, with no evidence of malignancy (Figs 5, 6).

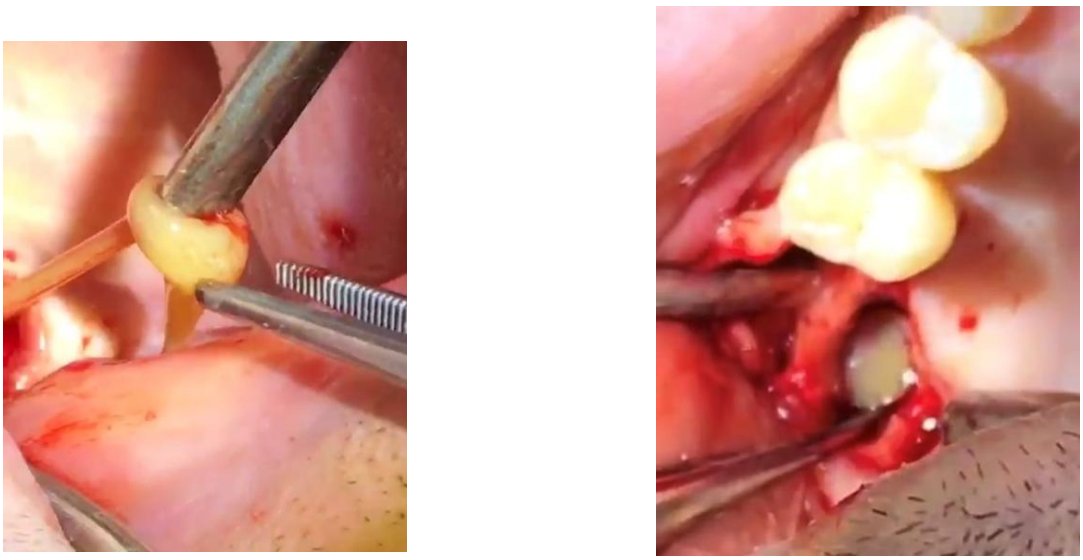

Figure 2. Clinical presentation of mucinous gel content with citrine yellow coloration

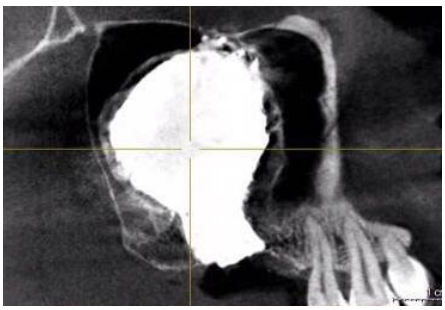

Figure 3. After extraction, enucleation and BIPP application

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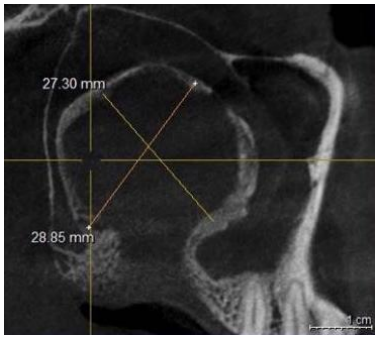

Figure 4. Three months post-operative CBCT

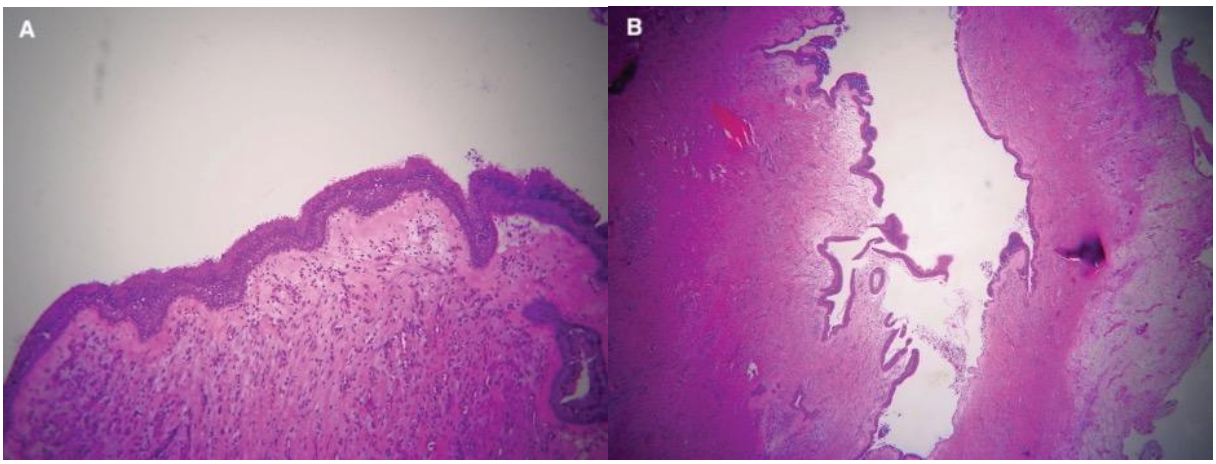

Figure 5. (A) H&E stain X 25 magnification, histopathological features of the mucous retention cyst include cystic space surrounded by a columnar pseudo-stratified epithelial layer, supported by a layer of loosely packed connective tissue. Additionally, a mononuclear inflammatory infiltration was observed in the underlying tissue. (B) H&E stain X 100 magnification, general view of the epithelial lining

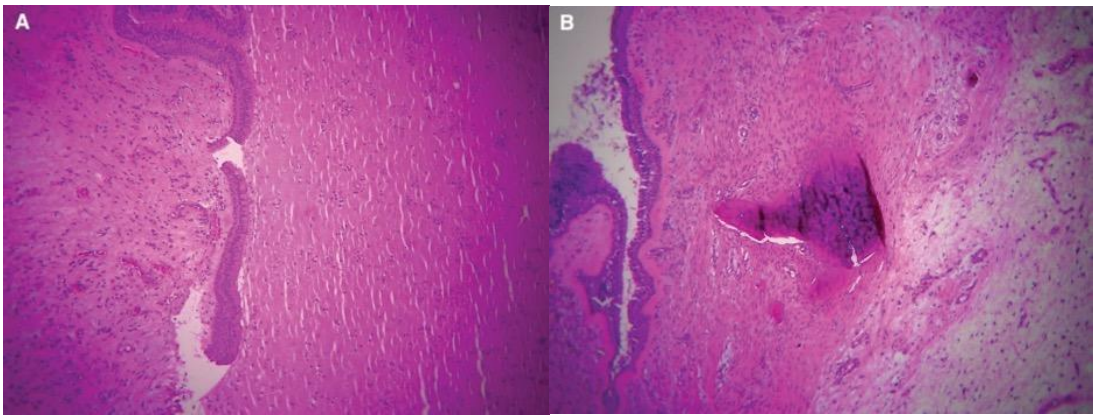

Figure 6. (A) H&E stain X 100 magnification, notice the mucin spillage. (B) H&E stain X 100 magnification, notice the calcification

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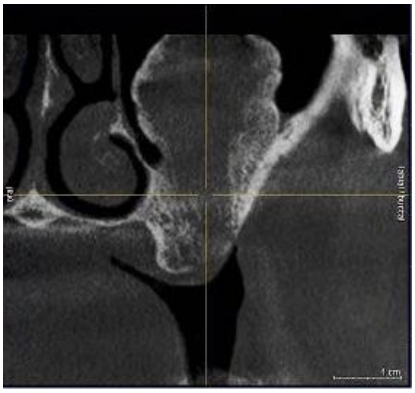

Figure 7. Six months post-operative CBCT with bone fill of the cystic site

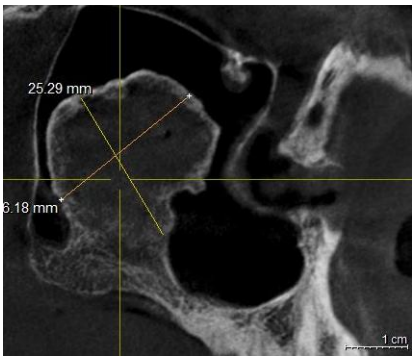

Figure 8. 12 months post-operative CBCT with bone fill of the cystic site

DISCUSSION

Veltrini et al. reported that periapical and periodontal disease of maxillary molars may be an important risk factors for sinusitis and MRCMS [7]. With respect to MRCMS, a long term follow-up study by Wang JH et al. demonstrated that out of 40 patients, 27 presented with at least one symptom, including nasal obstruction (52.5%), nasal discharge (37.5%), postnasal drip (35%), and headache (2.5%)[8]. In this case report, patient at site #17 had a periodontal disease associated with bone loss, deep pocketing, suppuration, swelling and the tooth was non-vital. In addition, there was a well-defined, radiopaque, thick solitary lesion with dimension 30x30x20 mm that occupied almost two thirds of the maxillary sinus and extended through an oroantral communication at the mesial of the second molar.

Cone-beam computed tomography (CBCT) utilization is considered a standard of care with respect to diagnosing MRCMS and examining the paranasal sinuses, because limitations of panoramic radiographs include lack of 3-dimensional imaging[9]. A differential diagnosis for a patient with MRCMS should be done, since other injuries may produce sinus radiographic radiolucency or opacity, such as apical radicular cyst, sinonasal polyp, neoplasm, odontogenic tumor, keratocyst, and dentigerous cyst [10]. The presence of a bony rim or sclerotic area around a cystic lesion on CBCT images may contradicts the diagnosis of a mucous retention cyst. This finding suggests a possible different pathological process, such as the bony rim or sclerotic area indicates a reaction of the adjacent bone to the presence of the lesion, which is not typically seen in mucous retention cysts. Therefore, final diagnosis usually depends on the histopathological examination. Considering the etiology of a cyst, it is hard to identify why periodontitis or tooth non vitality could cause gland blockage. On the other hand, disease in the area may cause disruption of normal functioning tissues.

The patient related to this case report did not know how long the cyst was in the maxillary sinus. In this regard, Giotakis et al. reported that the natural course of MRCMS is characterized by a decrease in cyst size in 30% of the cases, unchanged status in 50% to 60% of its occurrence, and a size increase in 8% to 20% of cases over 100 months [2]. Also, small lesions may have spontaneous regression [11]. It is recommended that symptomatic cyst must be removed surgically. Several surgical treatment options have been proposed in the literature such as, curettage or maxillary sinus puncture and aspiration through the inferior meatus or by a Caldwell–Luc operation, or by endoscopic Middle Meatus Antrostomy (MMA) or Inferior Meatus Antrostomy (IMA) [12-14]. With respect to recurrence rate, MRCMS have a low recurrence. For instance, Hadar et al. conducted a retrospective study of 60 patients diagnosed with MRCMS treated by endoscopic approach. He found a low recurrence rate (3%) and there were no complications associated with this procedure [14]. Despite the frequent use of endoscopic approach, it has several limitations: it does not completely expose the walls and limits the utilization of some instruments [15]. However, IMA provides an advantage with respect to clear visualization of the inferior,

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medial, and lateral walls and it promotes easy instrumentation [16]. In this case, there was an oroantral communication and a non-salvageable tooth. Therefore, it was decided to extract the tooth, and enucleate the cyst through the socket. This provided a conservative direct approach with straight access to the sinus cavity. BIPP was packed into the cystic cavity. BIPP is a yellow paste of composition Iodoform 40% w/w, Bismuth Subnitrate 20% w/w and Paraffin Liquid 40% w/w and is used to pack in wound cavities such as ear, nose, and sinus after surgery. BIPP has two active components; Bismuth has antibacterial properties provided by releasing dilute nitric acid and Iodoform releases iodine and acts as an antiseptic. Paraffin is added to the BIPP as a lubricant, which helps in atraumatic placement and removal of the packing [17]. Many studies reported the benefits of using BIPP. For instance, Gaur et al. managed a large dentigerous cyst of a child with BIPP dressing [17]. Moreover, Rajkumar GC et al. applied BIPP in a wide odontogenic keratocyst that was enucleated. The residual cavity was packed with BIPP and it provided a completely aseptic environment and promoted secondary healing [18]. Side effects of BIPP include allergic hypersensitivity reactions, neurotoxicity, and facial paralysis [19]. The overall incidences of reported side effects to BIPP are minimum. Limitation of this approach include compliance of the patient to irrigate the site and there may be delayed healing.

CONCLUSION

Careful diagnosis and treatment planning are crucial for management of different cystic lesions. This case was treated successfully with combination of extraction, enucleation and BIPP. The patient was monitored for 12 months after therapy.

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