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Simultaneous occurrence of a large residual cyst of the maxilla and a retention cyst of the maxillary sinus – case report

Jednoczesne występowanie rozległej torbieli resztkowej szczęki oraz torbieli zastoinowej zatoki szczękowej. Opis przypadku

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Summary

A residual cyst is a specific type of a radicular cyst that arises due to incomplete enucleation of granulation tissue, the cyst capsule or the persistence of an undiagnosed cyst following the extraction of the problematic tooth. Due to its asymptomatic nature, it may remain undetected for a long time. It is usually diagnosed incidentally through radiological examinations. A characteristic feature of a residual cyst is its tendency to grow despite the removal of the underlying cause. Similar to a radicular cyst, the origin of a residual cyst is the remnants of Malassez's epithelial rests located in the periodontal ligament affected by an inflammatory process. Residual cysts can reach considerable sizes and may expand into adjacent anatomical spaces, such as the maxillary sinuses, the nasal cavity or the mandibular canal. Within the maxillary sinuses, other cystic changes may also occur, such as mucoceles, pseudocysts,

Streszczenie

Torbiel resztkowa jest szczególną odmianą torbieli korzeniowej, która powstaje w wyniku niedoszczętnego wyłuszczenia ziarniny, mieszka torbieli lub pozostawienia nierozpoznanej torbieli po ekstrakcji zęba przyczynowego. Ze względu na swój bezobjawowy przebieg przez długi okres czasu może pozostać niewykryta. Zwykle diagnozowana jest przypadkowo dzięki badaniom radiologicznym. Cechą charakterystyczną torbieli resztkowej jest tendencja do wzrostu, pomimo usunięcia zęba przyczynowego. Podobnie jak w przypadku torbieli korzeniowej punktem wyjścia torbieli resztkowej są reszty nabłonkowe Malasseza znajdujące się w ozębnej objętej procesem zapalnym. Może ona osiągać znaczne rozmiary, a także wzrastać do sąsiadujących przestrzeni anatomicznych, takich jak zatoki szczękowe, jama nosowa czy kanał nerwu zębodołowego dolnego. W obrębie zatok szczękowych mogą również występować zmiany o charakterze torbieli np.

postoperative maxillary cysts and retention cysts. Among the aforementioned pathological changes within the maxillary sinuses, the most frequently detected is the retention cyst. This study discusses the diagnosis and surgical treatment of an extensive residual maxillary cyst and a retention cyst of the maxillary sinus located on the medial wall of the right maxillary sinus in a 61-year-old patient.

śluzowiaki, pseudotorbiele, pooperacyjne torbiele szczękowe, torbiele retencyjne. Najczęściej wykrywaną spośród wyżej wymienionych zmianą patologiczną w obrębie zatok szczękowych jest torbiel zastoinowa. W pracy omówiono diagnostykę oraz leczenie chirurgiczne rozległej torbieli resztkowej szczęki oraz torbieli zastoinowej zatoki szczękowej zlokalizowanej na ściśnie przyśrodkowej zatoki szczękowej prawej u 61-letniego pacjenta.

Introduction

A residual cyst is a specific variant of the radicular cyst that forms due to the incomplete removal of granulation tissue, the cyst capsule or an undiagnosed cyst left after the extraction of the causative tooth.[1,2] According to the fifth edition of the World Health Organization (WHO) Classification of Head and Neck Tumors published in 2022, a residual cyst is categorized among radicular cysts.[3,4] If left untreated, a residual cyst may grow considerably, leading to both the destruction of the surrounding bone and the invasion of adjacent anatomical spaces. A distinctive feature of a residual cyst is its ability to grow even after the causative tooth has been removed.[5] However, it can also regress or remain stable over time.[6] Similar to radicular cysts, residual cysts can be asymptomatic for extended periods.[6-9] They are often chance findings on radiographs or when both become infected.[6,10] They develop due to chronic inflammation of the periradicular tissues, resulting in the formation of a periapical granuloma and subsequently stimulating the proliferation of the epithelial rests of Malassez. This is followed by central degeneration and necrosis, which results in the formation of a cavity. According to *High* et al., residual cysts represent approximately 10% of all odontogenic cysts.[8,11] Other studies report a prevalence of 4.26% or even as high as 18% for such lesions. Residual cysts typically occur in patients with an average age of 52 years and are most commonly found in the maxilla. They predominantly affect males, with a male-to-female ratio of 3:2. Although there is a potential for malignant transformation into squamous cell carcinoma, the risk of this occurrence is very low – below 1% for radicular cysts and slightly higher for residual cysts.[1]

A mucous retention cyst of the maxillary sinus forms as a result of the blockage of the duct of a small mucous gland within the mucous membrane of the maxillary sinus.[12] The blockage is most commonly caused by a plug of thickened mucous tissue or a small concretion. Many researchers have suggested an environmental cause and that their formation has been related to seasonal changes, mainly in the beginning of spring and autmn.[13,14] A retention cyst of the maxillary sinus is usually asymptomatic. Studies have shown that it occurs in 1.6% to 14% of the population. It is most often detected incidentally during radiographic examination in patiens between the ages of 20 and 40.[15] A retention cyst manifests itself as a dome-shaped radiopacity in the sinus.[16] There is no consensus as to the gender predomination with some sources suggesting that it is more commonly found in women, while others claim it is more frequent in men. In the majority of

cases, a retention cyst of the maxillary sinus develops unilaterally, with bilateral occurrence observed in about 18% of cases. The most common location is the floor of the maxillary sinus (75%), with much rarer occurrences on the lateral or medial wall of the sinus. A retention cyst of the maxillary sinus usually does not cause any symptoms. Sometimes, dull headaches and discomfort in the mid-facial area may occur, along with nasal obstruction, yellow nasal discharge, and postnasal drip. These symptoms may occur when the retention cyst reaches a considerable size, which can lead to sinus obstruction and, consequently, chronic sinusitis.

A mucous retention cyst can dissolve without any medication.[13] In 60% of cases its volume remains stable, in 30% the volume shrinks or can disappear completely, only in 10% its volume increases.[13]A retention cyst that does not cause symptoms does not require treatment, only periodic clinical and radiological monitoring. Cysts that cause clinical symptoms or are located on the medial wall of the maxillary sinus require surgical intervention.

Case Report

A 61-year-old male patient presented at the Department of Oral Surgery for a scheduled procedure to remove a residual cyst in the maxilla. The patient's medical history revealed that the cyst had been first detected on a panoramic radiograph approximately 10 years earlier. The patient reported that a impacted tooth had been previously present in the area of the residual cyst and subsequently extracted. Despite being aware of the osteolytic lesion in the maxilla, the patient delayed further treatment due to fear of cancer. In 2023, he decided to undergo prosthetic treatment. The prosthodontist who examined the patient ordered an orthopantomogram (OPG) (Fig.1) and informed the patient that prosthetic restoration would only be possible after the extensive residual cyst in the maxillary alveolar ridge was removed.

On the day of the procedure the patient reported no pain. He was undergoing chronic treatment for hypertension. His blood pressure before the surgery was 150/90 mmHg. He was a smoker with no reported allergies. There were no contraindications for the surgical intervention.

Clinical examination revealed facial asymmetry. The upper lip and part of the cheek on the right side appeared elevated, more pronounced compared to the left side.

Intra-oral examination showed that the maxillary alveolar ridge on the right side was significantly expanded, with noticeable vestibular bone prominence. Fluctuation (fluid movement) was palpable.

The patient provided an orthopantomographic image (Fig. 1) and cone-beam computed tomography (CBCT) (Fig. 2, Fig. 3). On the OPG, the residual cyst was difficult to detect despite its size. The cone-beam tomography, however, clearly showed the extent of the osteolytic lesion, located in the maxillary alveolar ridge on the right side and protruding into the maxillary sinus, which was also not fully aerated. The mucous membrane of the right maxillary sinus was thickened. The osteolytic lesion measured 1.93 cm x 2.09 cm x 2.41 cm.

After obtaining written consent for the procedure, an incision and full-thickness flap elevation were performed under local anesthesia with Citocartin 1:100,000. The bone plate was removed to expose the cyst, which was fully enucleated and sent for histopathological examination (Fig. 4). Due to the destruction of the bone plate, the interior of the right maxillary sinus was revealed, where a lesion of a retention cyst was present on the medial wall. The material was collected and sent for histopathological examination as well (Fig. 5). The cavity was

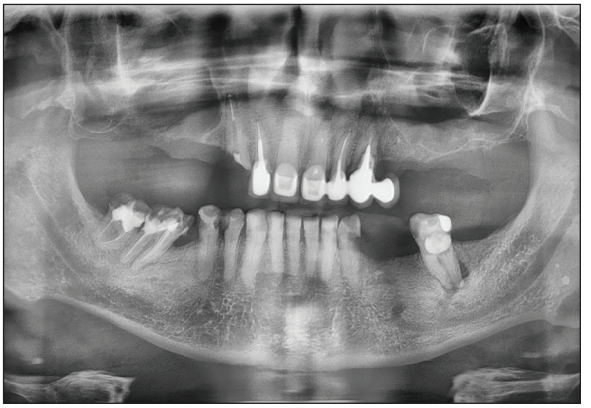

Fig. 1. Orthopantomogram.

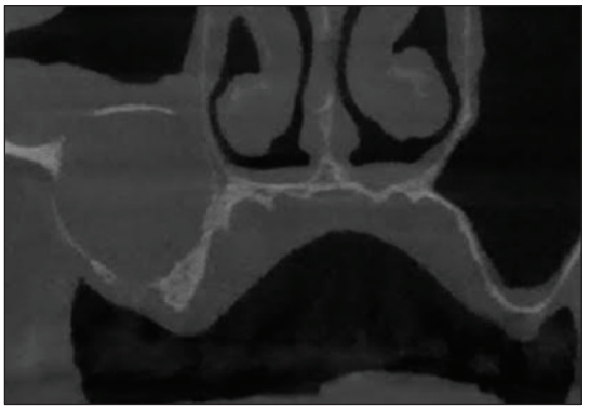

Fig. 2. Cross-sectional cone beam computed tomography (CBCT) image – frontal plane view.

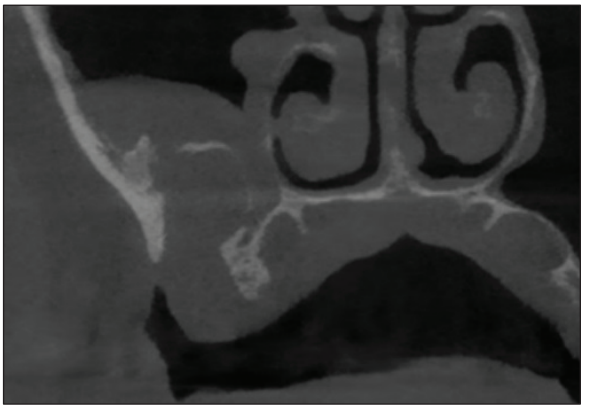

Fig. 3. Cross-sectional cone beam computed tomography (CBCT) image – frontal plane view.

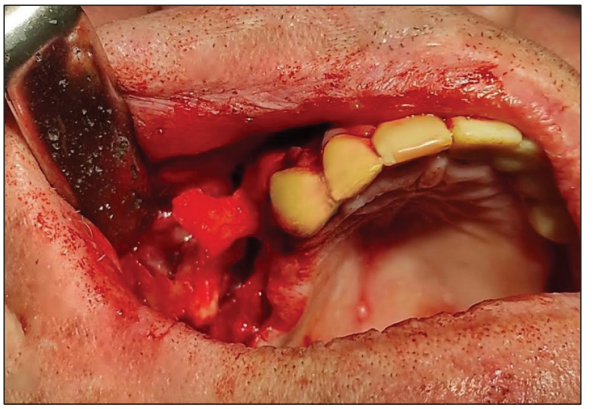

Fig. 4. Intraoperative image.

Fig. 5. Image showing a residual cyst and a retention cyst after their enucleation.

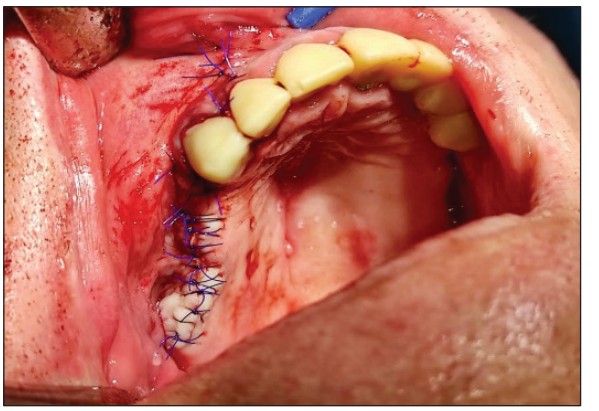

Fig. 6. Intraoperative image – post-flap repositioning and wound suturing.

irrigated with 0.5% Metronidazole, and sharp bone edges were smoothed. The flap was repositioned and sutured without tension using non-resorbable 4.0 sutures (Fig. 6). Surgical dressing was applied. Written postoperative instructions were provided. The patient was prescribed Augmentin 1 g (1 tablet every 12 hours) and Nimesil 100 mg (1 sachet every 12 hours). Follow-up visits were scheduled for 1, 7, 14, and 21 days, and at 3 and 6 months

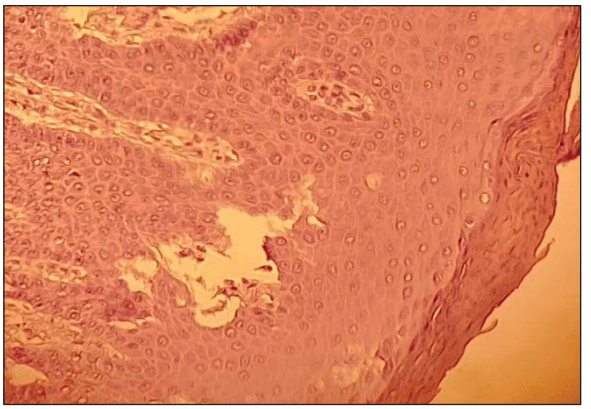

Fig. 7. Microscopic image showing tissue stained with the hematoxylin-eosin (H&E) method – stratified squamous epithelium without signs of dysplasia.

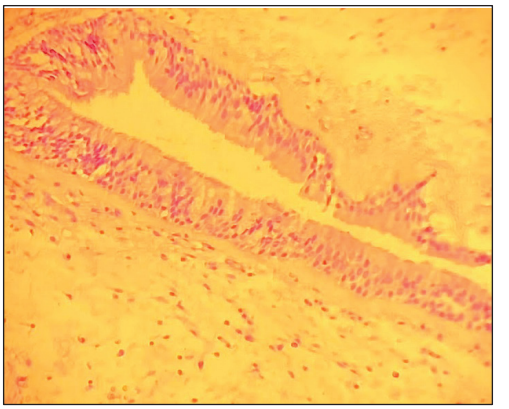

Fig. 8. Microscopic image showing tissue stained with the hematoxylin-eosin (H&E) method – pseudostratified columnar epithelium.

postoperatively. The sutures were removed after 14 days. The patient felt very well and reported no pain. The wound healed properly.

Histopathological examination confirmed the initial diagnosis. The first specimen corresponded to a residual cyst, while the second was a mucous retention cyst of the maxillary sinus. The microscopic diagnosis of the first specimen was a cyst lined with non-keratinized stratified squamous epithelium without dysplasia (Fig. 7), which in places arched inward into the stroma. The stroma consisted of loose, edematous connective tissue with areas of granulation and chronic inflammatory infiltrates. Rushton bodies were visible in the cyst lumen. In the second specimen, mucoserous content was detected, mixed with scattered eosinophils, neutrophils, and lymphoid cells (Fig. 8).

Discussion

The article presents a rare case of simultaneous occurrence of two cyst-like lesions in the upper jaw. The first was a large residual cyst that protruded into the lumen of the right maxillary sinus. The second was an asymptomatic retention cyst of the right maxillary sinus, located on its medial wall (75% of cases occur within the floor of the maxillary sinus). In 2012, *Jamdade* et al. noted in their publication that residual cysts could occur in both the maxilla and mandible, but they were more commonly found in the mandible above the inferior alveolar nerve canal.[17] Their growth can cause displacement and resorption of adjacent teeth. Residual cysts are a type of a radicular cyst and, like them, may undergo malignant transformation into squamous cell carcinoma. Although the risk of such transformation is low, treatment of a residual cyst should involve careful enucleation or curettage. For large residual cysts, where single-stage removal could damage important anatomical structures, a two-stage approach may be undertaken. Retention cysts, on the other hand, usually do not require treatment, which is why data on their histological characteristics are rarely encountered. In most cases, due to their non-specific histological appearance, diagnosis is made by clinical presentation and imaging results. When a retention cyst of the maxillary sinus is detected, periodic clinical and radiological examinations are generally recommended. These types of lesions are often stationary and may resolve on their own. Surgical intervention is required for cysts exceeding half the volume of the maxillary sinus and those located on the medial

wall. Currently, endoscopic removal is the most recommended treatment method.

Conclusion

The proximity of the oral cavity to the maxillary sinus highlights the importance of a detailed examination of pathologies in this region. Many pathological changes in the form of cysts may not present any symptoms and, consequently, can remain undetected for many years. A thorough history, clinical and radiological examination may aid in the effective detection of pathologies at an early stage. The authors of the article aimed to emphasize the importance of regular radiological diagnostics (especially CBCT) for patients of all ages. Even in edentulous areas of the oral cavity, pathological changes can develop.

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