



# Cholesterol Granuloma of the Maxillary Sinüs: A Case Report

## Maksiller Sinüsde Kolesterol Granülümü: Olgu Sunumu

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### Abstract / Özet

Cholesterol granuloma is a description of the reaction of different tissues to the presence of cholesterol crystals. It can be found in several areas of the body, including middle ear, mastoid process, breast, sella turcica, pontocerebelline angle, testis, lungs, brain, and kidneys, and in the apex of the temporal bone pyramid. Maxillary sinus localization is rare. A 24-year-old woman presented with symptoms of nasal obstruction and headache. Computed tomography scan of the paranasal sinuses showed a lesion of soft tissue density occupying the right maxillary sinus. The lesion, localized in the right maxillary antrum, was excised. Histopathological examination revealed an intact mucosa with a large number of submucosal cholesterol clefts surrounded by foreign body granulation tissue. These findings led us to the diagnosis of cholesterol granuloma. Cholesterol granuloma should be considered in the differential diagnosis of sinus lesions. Complete excision would provide a good prognosis.

**Key Words:** Cholesterol granuloma, maxillary sinus, histopathology

Kolesterol granülümü değişik dokuların kolesterol kristallerine karşı bir reaksiyonudur. Orta kulak, mastoid kemik, meme, sella tursika, pontose-rebellar açığı, testis, akciğerler, beyin, böbrekler ve temporal kemikte görülebilir. Maksiller sinüs lokalizasyonu nadirdir. Yirmi dört yaşında kadın hasta burun tıkanıklığı ve baş ağrısı yakınmaları ile başvurdu. Paranasal sinüslerin bilgisayarlı tomografisinde sağ maksiller sinüste yumuşak doku dansitesi izlendi. Sağ maksiller antrumda lokalize olan lezyon eksize edildi. Histopatolojik incelemede intakt respiratuar epitel altında submukozal kolesterol kleftleri izlendi. Kolesterol kleftlerinin çevresinde yabancı cisim dev hücreleri, köpüksü hücreler, kronik inflamatuvar hücreler ve hemosiderin mevcuttu. Tanımlanan bulgularla olguya kolesterol granülümü tanısı verildi. Sinüs lezyonlarının ayırıcı tanısında kolesterol granülümü da akılda bulundurulmalıdır. Komplet eksizyon sonrasında prognoz iyidir.

**Anahtar Kelimeler:** Kolesterol granülümü, maksiller sinüs, histopatoloji

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## Introduction

Cholesterol granuloma (CG) is a description of the reaction of different tissues to the presence of cholesterol crystals (1). It can be found in several areas of the body, including middle ear, mastoid process, breast, sella turcica, pontocerebelline angle, testis, lungs, brain, and kidneys, and in the apex of the temporal bone pyramid. It is seen associated with chronic middle ear disease but is very rare in the paranasal sinuses. In the paranasal sinuses, maxillary sinus seems to be the most common site (2). We report here an additional case with a review of the relevant literature.

## Case Report

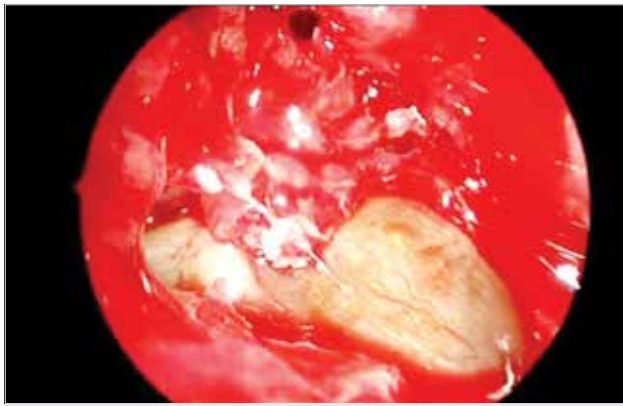
A 24-year-old woman presented with symptoms of nasal obstruction and headache. Computed tomography (CT) scan of the paranasal sinuses showed a lesion of soft tissue density occupying the right maxillary sinus (Figure 1). The findings were suggestive of a retention cyst. Endoscopic sinus approach was performed. The lesion, localized in the right maxillary antrum, was excised (Figure 2). Histopathological examination revealed an intact mucosa with a large number of submucosal cholesterol clefts (Figure 3). Empty clefts indicate the place of cholesterol crystals dissolving during tissue embedding. They were surrounded by multinucleated foreign body giant cells, foam cells, chronic inflammatory cells, and hemosiderin (Figure 4). The histopathologic diagnosis was CG. No evidence of recurrence has been noted 1 year after excision.

## Discussion

Several mechanisms seem to be involved in the pathogenesis of maxillary sinus CG. They are impairment of drainage, disturbed ventilation, and hemorrhage into the sinus with hemolysis (3). The source of cholesterol is considered to be the cell membrane of erythrocytes destroyed during bleeding, which precipitates in a crystalline form, due to inadequate drainage (4). These crystals stimulate a foreign body reaction that causes migration of leukocytes and macrophages, which will further give rise to foreign body giant cells (3). Additionally, connective tissue degeneration due to reduction of the ventilation, caused by osteomeatal complex obstruction by trauma and inflammatory products, can also contribute to cholesterol crystals. Due to its pathogenesis, maxillary sinus CG is often associated to a history of rhinitis, sinusitis, trauma, and paranasal



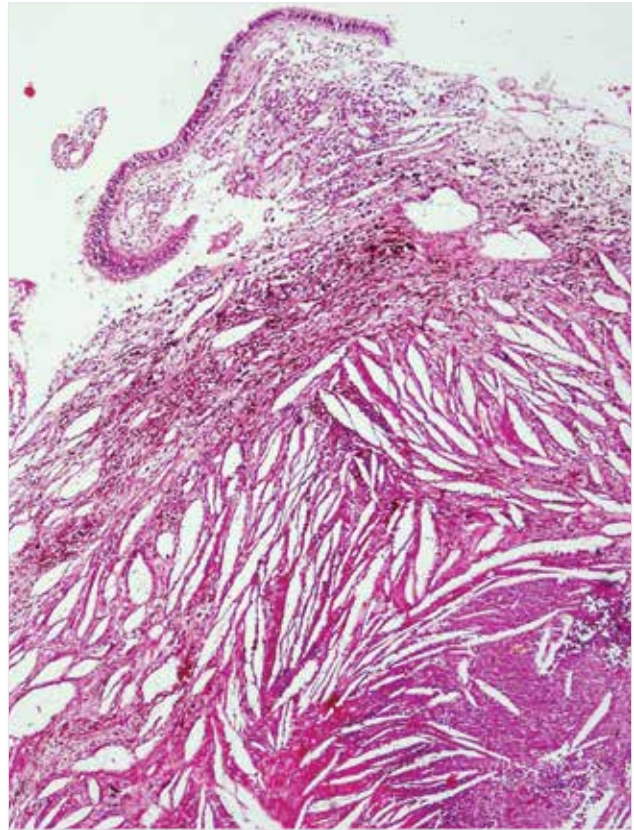
**Figure 1.** CT image of the paranasal sinuses showing a lesion of soft tissue density occupying the right maxillary sinus  
CT: computed tomography



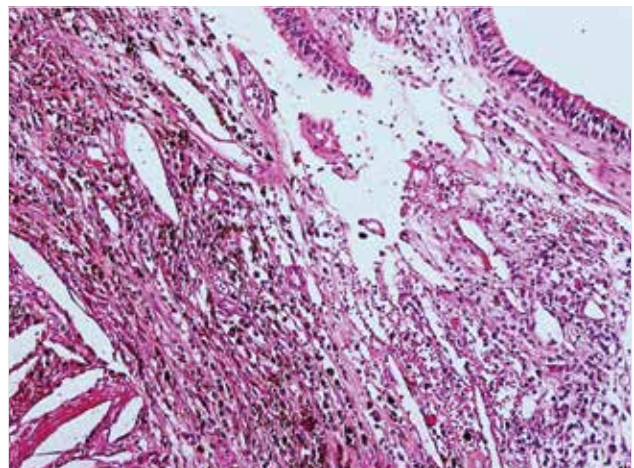
**Figure 2.** Intraoperative endoscopic photography of the soft tissue mass localized in the right maxillary antrum

sinus surgery, especially because they can cause local bleeding focuses (4-8).

Since first reported by Graham and Michaels in 1978, there have been 47 cases of maxillary sinus cholesterol granuloma in the literature (3-6, 9-14). CG of the maxillary sinus affects men more than women, particularly those in their 40s (10). It develops more frequently in Caucasians and Turkish (2). The left antrum is more commonly affected than the right one. Bilateral involvement is rare (2, 11). About half of the patients present with non-specific symptoms. Nasal obstruction, postnasal drip, or rhinorrhea can be noted. An episode of clear golden yellow rhinorrhea is the only specific symptom of maxillary sinus CG (2, 9). As with the clinical features, CT scanning usually reveals nonspecific findings. The most common changes are antrum opacification and a cystic appearance, while other less common features include bone expansion and erosion (10). Magnetic resonance imaging was reported to have more specific findings. There is increased signal intensity in T1- and T2-weighted images. It can be attributed to the effect of



**Figure 3.** Large number of submucosal empty clefts and overlying intact respiratory epithelium (HEx40)



**Figure 4.** Chronic inflammatory cells and hemosiderin surrounding the empty clefts (HEx100)

hemoglobin breakdown products derived from microhemorrhages around cholesterol crystals (8). However, histopathological examination is necessary for final diagnosis. The treatment of choice is surgical excision. The prognosis is good after operation. Complete excision is important to avoid recurrence (2).

## Conclusion

We present here a case of maxillary sinus CG located in the right maxillary antrum of a 24-year-old woman. Cholesterol granuloma should be considered in the differential diagnosis of sinus lesions. Complete excision would provide a good prognosis.

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