

## **Different Radiologic Appearances of Giant Epidermoid Cysts at the Floor of the Mouth: Three Case Reports**

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### **ABSTRACT**

Epidermoid and dermoid cysts are benign lesions which may occur anywhere on the body. Seven per cent of these lesions occur in the head and neck region and 1.6% in the oral cavity. We presented three cases of giant epidermoid cysts located on the floor of the mouth. Case one was a 22-year-old man referred to our clinic with a 10-year history of a submental mass which began growing and causing pain in the throat. Physical examination revealed masses in both the submental and sublingual regions. Magnetic resonance imaging (MRI) with contrast revealed a well-circumscribed iso-hypointense cystic mass with a 'sack-of-marbles' appearance. Case 2 involved a 23-year-old female referred to our clinic with difficulty in chewing and swallowing solid food for one week previously. Physical examination revealed a sublingual mass displacing the tongue upward. Magnetic resonance imaging revealed a heterogeneous hyperintense cystic mass in the sublingual region. Case 3 was a 28-year-old man referred to our clinic with submental swelling, difficulty in breathing and swallowing, decreased tongue movements and snoring. Computerized tomography (CT) indicated a homogenous cystic mass in the submental region. Excision of the masses with an extraoral approach was performed in all three cases. Histopathological examination revealed epidermoid cyst. In summary, epidermoid cysts may assume various appearances at radiological imaging.

**Keywords:** Epidermoid cysts, dermoid cysts, sack-of-marbles

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## INTRODUCTION

Epidermoid and dermoid cysts are benign lesions which may occur anywhere on the body. Seven percent of these lesions occur in the head and neck region and 1.6% in the oral cavity (1). In 1955, Meyer divided dermoid cysts into three histological types. If the wall of the cyst contains only squamous epithelium, this is known as epidermoid cyst. Dermoid cysts contain skin adnexa, and teratoid cysts contain all three germ layers (2, 3). Diagnosis depends on clinical findings, imaging and histological examination. Epidermoid cysts may produce different appearances at imaging scans. Treatment is surgery, which can be performed using intraoral or extraoral approaches. The choice of surgical approach depends on the location and size of the mass (4). We described three cases of giant epidermoid cysts on the floor of the mouth.

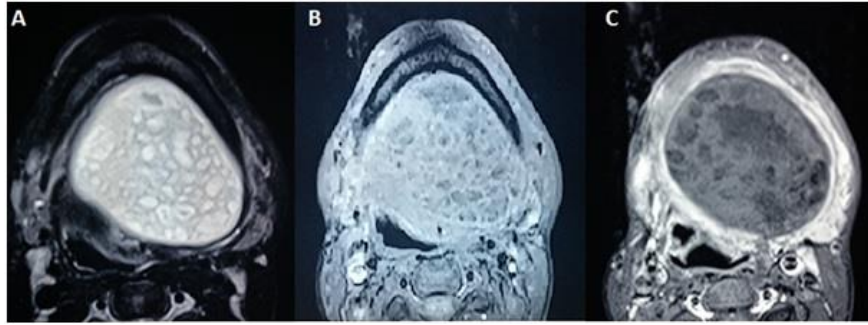
## CASE 1

A 22-year-old man presented with a 10-year history of a submental mass which had begun growing two months previously. He also reported pain in the throat and difficulty in chewing, speaking and swallowing. Physical examination revealed a non-tender, fluctuant, soft, mobile mass in the submental region (Fig 1. A). At oral examination, a mass was observed in the sublingual region, displacing the tongue upwards (Fig I. B).



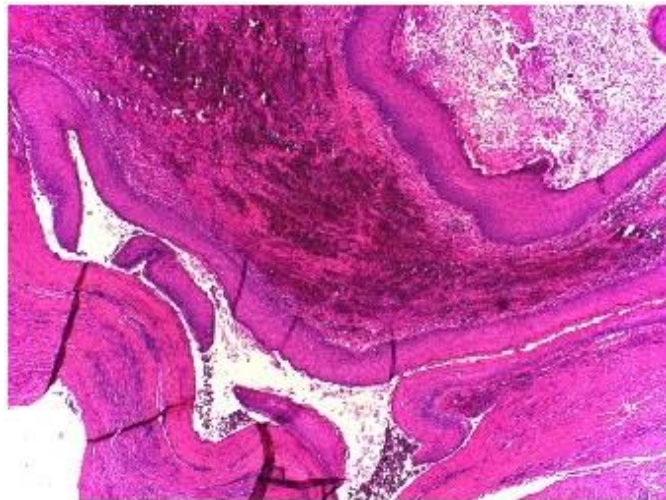
**Fig. 1:** The appearance of cystic mass: A- At submental region. B- At sublingual region.

Ultrasonography (USG) revealed a hypoechoic cystic area containing multiple hyperechoic structures. Magnetic resonance imaging (MRI) with contrast revealed a well circumscribed iso-hypointense cystic mass, 7.5 x 6.5 cm in diameter, resembling a 'sack of marbles' in appearance due to coalescence of fat into the small nodules. Gadolinium-enhanced images also showed a cystic mass with peripheral rim-like contrast uptake (Fig. 2).

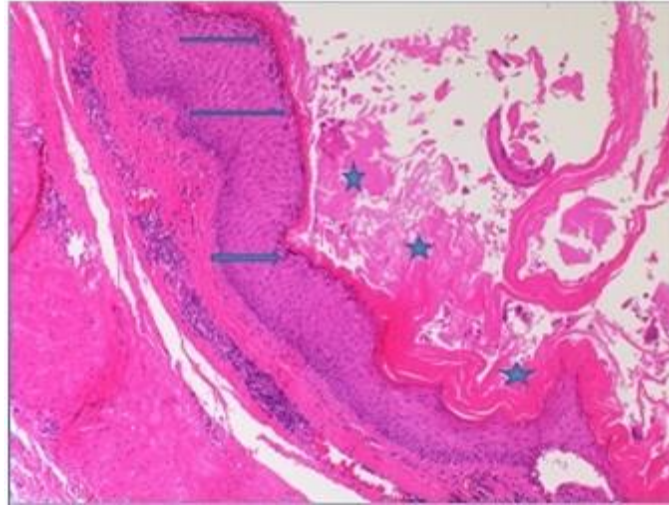


**Fig. 2:** A-Axial T2 weighted images show cystic hyperintense mass with sack of marbles (coalescence of fat into the small nodules) in the floor of the mouth. B-Axial T1 weighted images show iso-hypointense cystic mass in the mouth base. C- Gadolinium enhanced axial T1 weighted images show cystic mass with peripheral rim-like contrast enhanced.

The mass was totally excised using an extraoral approach. Histopathological examination revealed portions of an encapsulated specimen lined with a multilayered epidermal-type benign squamous epithelium (Fig. 3) and containing keratin in the lumen (Fig. 4). No adnexal structures in the cyst wall or evidence of malignancy were observed. Histopathological diagnosis of the mass was epidermoid cysts.



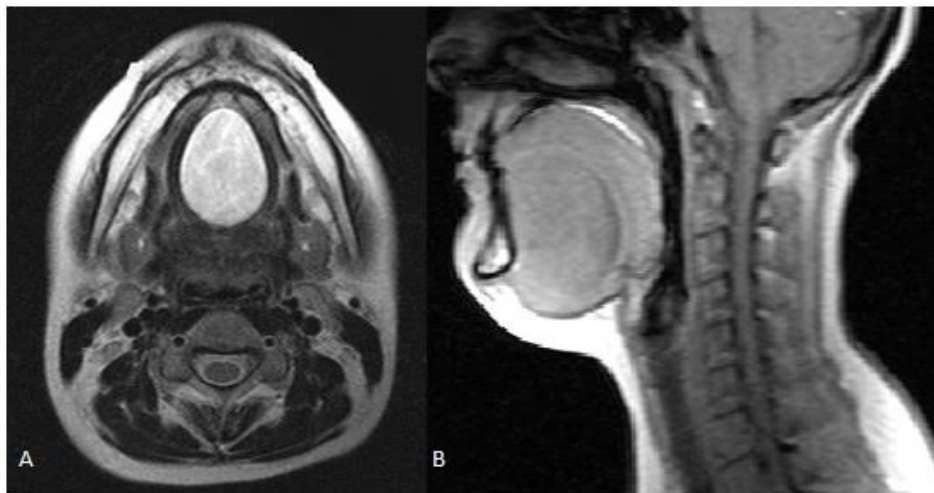
**Fig. 3:** (HE X 50) Histological section shows the cyst containing keratinous material arranged in laminated layers and is lined by stratified squamous epithelium.



**Fig. 4:** (HE X 100) higher magnification showing that the cyst wall is composed of several layers of stratified squamous epithelium including the granular layer (arrow) and the cyst containing keratinous material (asterisk).

## CASE 2

A 23-year-old female presented with difficulty in chewing and swallowing solid food over the previous week. She also had a one-month history of a non-tender mass in the submental region. There was no history of trauma or surgery to the oral cavity or neck. Physical examination revealed a sublingual mass displacing the tongue upward. Magnetic resonance imaging revealed a heterogeneous hyperintense cystic mass in the sublingual region, 4 x 4 x 5 cm in size (Fig. 5).



**Fig. 5:** T1 weighted magnetic resonance imaging image show heterogenous hyperintense cystic mass at sublingual region. A: Axial B: Sagittal.

Surgical excision was performed under general anaesthesia using an extraoral approach. The mass lying under the mylohyoid muscle and extending towards the base of tongue at a deeper location was excised. At histological examination, diagnosis was epidermoid cysts.

### CASE 3

A 28-year-old man was referred to our clinic with dyspnea, shortness of breath and a painless, growing mass in the submental region. The patient had been monitored and treated for obstructive sleep apnea syndrome (OSAS) for two years prior to referral to our clinic due to typical OSAS symptoms such as snoring and daytime sleeplessness. At physical examination, a painless, mobile, soft mass was observed in the submental region. Computerized tomography (CT) indicated a homogenous cystic mass in the submental region, beginning from the corpus of the hyoid bone and passing through the base of tongue, 5 x 5 x 6 cm in size (Fig. 6).



**Fig. 6:** Computerized tomography images show homogenous cystic mass at submental region. A: Sagittal B: Axial.

Surgical excision was performed under general anaesthesia using an extraoral approach. Histopathological examination revealed epidermoid cysts. Considerable alleviation of OSAS findings was achieved after surgical intervention.

## DISCUSSION

Numerous disorders may affect the submandibular region and the floor of the mouth. These include congenital lesions such as dermoid cysts, lymphoepithelial cysts and thyroglossal cysts, benign or malignant tumours of the salivary glands or mesenchymal tissues, and infections such as periapical abscess, pericondritis or sialadenitis (4).

Epidermoid cysts may be congenital or acquired. The pathogenesis of these cysts is unclear. Congenital cases arise from ectodermal residual tissues while acquired lesions arise from trauma, inflammation or surgery (5). Epidermoid cysts are generally diagnosed at young ages, especially in the second or third decades (4). Our patients were aged 22, 23 and 28.

Physical examination alone is not enough to diagnose diseases of this region. On CT scans, dermoid cysts appear as thin-walled, unilocular masses with a central cavity. The central cavity is filled with a homogenous, hypoattenuating (0–18 HU) fluid material with multiple marbles. The “sack-of-marbles” appearance results from coalescence of fat into the small nodules and is virtually pathognomonic for dermoid cysts in this location (6). Epidermoid cysts exhibit fluid attenuation at CT and can also produce the sign known as ‘sack-of-marbles’ (7). At MRI, epidermoid cysts have the same signal intensity as fluid (7). Due to these various appearances at imaging, CT or MRI are not sufficient to distinguish epidermoid cysts from other cystic lesions. However, these methods are still important in assisting the surgeon in choosing the appropriate surgical approach.

Specific diagnosis depends on histopathological examination after surgical excision (8). Epidermoid cysts are known as ‘pearly tumours’ because of their shiny, smooth and waxy character at macroscopic examination. Histologically, epidermoid cysts are lined by a thin squamous epithelium which is rarely calcified. The cysts contain debris from desquamating lining of the epithelium, keratin and cholesterol (9).

The only effective treatment of these lesions is surgical enucleation. The surgical approach employed varies according to the size and location of the mass. Although intraoral approaches give better cosmetic and functional results, it is preferable to remove small and middle-sized tumours intraorally. Extraoral approaches are recommended for larger cysts (1, 8). Extraoral approaches were employed in our cases due to the size of the cysts.

Prognosis is good. Recurrence or relapse is extremely rare after surgery. No recurrence was observed in our cases after six-month follow-up.

Epidermoid cysts, rare lesions of the head and neck region, are generally asymptomatic until the increased mass causes pressure symptoms. As in Case 3, epidermoid cyst may rarely lead to OSAS. The presence of epidermoid cyst should be investigated in patients with OSAS complaints. Epidermoid cysts may exhibit various appearances on imaging studies. We describe three cases of giant epidermoid cysts on the floor of the mouth with different appearances at radiological imaging.

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