Case Report

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Atypical site of nasopharyngeal branchial cleft cyst: A case of an unusual age presentation

Salma S. Alsharhan, Aishah A. Alghuneem[1], Danah F. Alrusayyis[1], Marwah S. Aljahli[1,2]

Departments of Otorhinolaryngology and [1]College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, [2]King Fahad Hospital of the University, Al Khobar, Saudi Arabia

Address for correspondence:
Dr. Salma S. AlSharhan, Department of Otorhinolaryngology, College of Medicine, Imam Abdulrahman Bin Faisal University, P.O. Box 6470, Dammam 34211, Saudi Arabia.
E-mail: ssalsharhan@iau.edu.sa

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Abstract:

Nasopharyngeal branchial cleft cysts (NBC) are generally single, unilateral, and asymptomatic. They may get infected or produce obstructive symptoms as it enlarges. The definitive diagnosis is usually confirmed by Magnetic resonance imaging (MRI) and histopathology. A 54-year-old male patient presented with progressive bilateral nasal obstruction, more on the right side, associated with hyponasal voice and postnasal discharge of 2 years' duration. A cystic mass was found by nasal endoscopy on the lateral right side of the nasopharynx, extending to the oropharynx, and was confirmed with MRI findings. Uneventful total surgical excision and marsupialization were done with follow up of nasopharyngeal endoscopic examination on each visit. The pathological features and the site of the cyst were compatible with a second branchial cleft cyst. Although rare, NBC should be considered one of the differential diagnoses of nasopharyngeal tumors. Surgical excision and marsupialization are the main treatment with low complication and recurrence rates.

Keywords:

Branchial cleft cyst, endoscopic approach, nasopharyngeal mass

Introduction

Nasopharyngeal branchial cleft cysts (NBC) are rarely encountered in clinical practice, but are discovered incidentally during a routine nasopharyngoscopy or radiological imaging.[1] NBCs are classified into midline and lateral cysts. Midline cysts such as Tornwaldt's cysts are usually congenital lesions. NBC are found in the anteromedial border of the sternocleidomastoid muscle.[1,2] They result from incomplete obliteration of nasopharyngeal clefts during normal embryonal development and second cleft cysts representing 70%–90%.[3] As the cyst slowly enlarges, it produces obstructive symptoms such as nasal obstruction, rhinorrhea, aural fullness, decreased hearing, dysphagia, dyspnea, or stridor. In symptomatic adult patients, excluding cystic metastasis from head and neck carcinoma is vital because of the similarity of the presentation.[3,4]

According to the literature, a definitive diagnosis is usually made by radiological imaging and histopathology which show cysts lined with respiratory stratified squamous epithelium overlying abundant lymphatic tissue.[1]

Surgical excision is the treatment of choice in symptomatic patients. Most of the literature report satisfactory results with a low recurrence rate.[3,4] An initial course of antibiotics preceding surgery is advised.[3]

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A 54-year-old Saudi male patient known case of primary hypertension, chronic kidney disease, hyperuricemia, and aortic

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valve regurgitation post aortic valve replacement presented with a history of progressive bilateral nasal obstruction, more on the right side associated with hyponasal voice and postnasal discharge of 2 years' duration. A nasopharyngeal mass had been discovered 2 years previously by computer tomography scan in Germany. However, biopsy and further management were rejected by the patient. He had a history of recurrent right-sided epistaxis attacks, mild in amount which stopped spontaneously. The patient denied any cough, dyspnea, or otological symptoms. With the aid of nasal endoscopy, a cystic mass in the right lateral side of the nasopharynx, extending to the oropharynx covered by normal mucosa with no ulceration was found [Figure 1]. Magnetic resonance imaging (MRI) demonstrated a well-demarcated cystic mass measuring 2.9 mm × 13.6 mm/44.7 mm × 22.4 mm occupying half of the right lateral nasopharynx wall [Figure 2a and b].

Under general anesthesia, total resection was performed via a combined approach, first of an endoscopic transnasal one through 0° and 30° scopes, when the partial cyst was excised, followed by a transoral approach by 70° scope to ensure the total removal of the branchial cyst. The cystic mass found was filled with yellowish seromucinous fluid. Mindful of the soft and hard palate, marsupialization was performed using the microdebrider (powered instrument) without causing any injury. The bleeding was controlled with electro-cautery and nasal packing was applied for 48 h.

Histopathology study revealed fibrocollagenous cyst wall lined with epithelial cells consisting of both respiratory pseudostratified ciliated columnar and stratified squamous type, with subepithelial dense lymphocytic infiltrate with germinal centers formation [Figure 3a and b].The site of the cyst and the pathological features were consistent with the findings of a second branchial cleft cyst. The procedure was uneventful; the patient was discharged the following day and scheduled for follow-up appointments at the outpatient clinic. Nasopharyngeal endoscopic examination done on each visit confirmed the lack of recurrence.

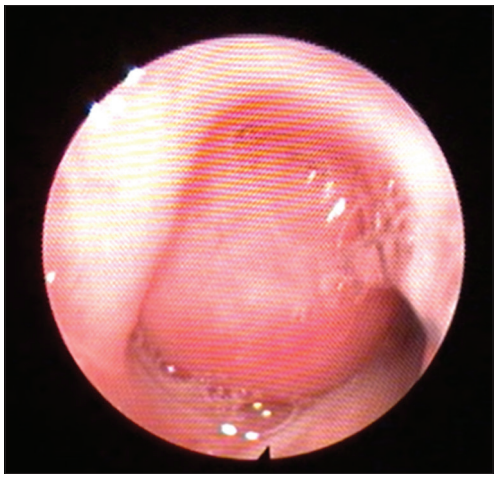

Figure 1: Cystic mass at the right lateral side of the nasopharynx

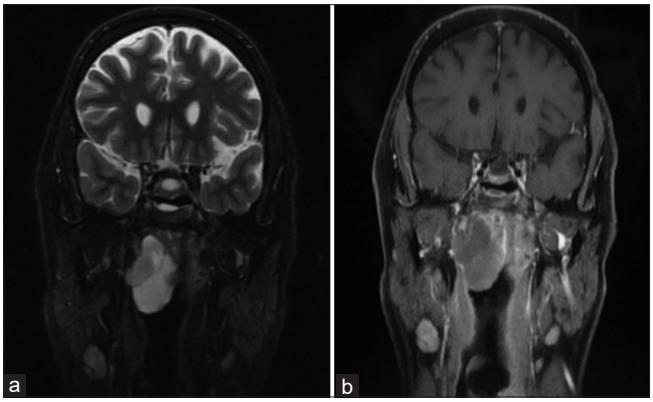

Figure 2: (a and b) MRI showed a well-demarcated cystic mass occupying the half right lateral wall of the nasopharynx. MRI: Magnetic resonance imaging

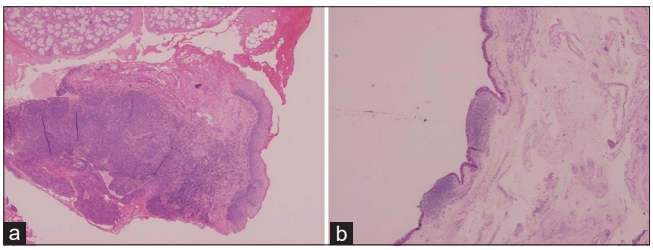

Figure 3: (a) Squamous epithelial lining with underlying dense lymphocytic infiltrate with germinal centers formation. (b) Cyst wall lined by ciliated respiratory epithelium with subepithelial lymphocytic infiltrate

Discussion

Of all branchial anomalies, NBC is the rarest. Although it can arise from either first or second branchial arches, the second branchial cyst is the commonest.[2] Anomalies of the branchial cleft are usually found early in life, in late childhood or early adulthood, and usually, appear as a mass. The differential diagnosis of a nasopharyngeal mass includes Tornwaldt's cysts, dermoid cyst, oncocytic cysts, thymic cyst, and mucus retention cyst. However, NBC are along the anterior border of the sternocleidomastoid muscle in the upper third of the neck, inferior to the mandible, and lateral to the carotid vessels. It is rarely found in the nasopharyngeal or parapharyngeal spaces.[1,2,5] In 2013, Kim *et al.,* rported two cases of a symptomatic branchial cleft cyst. The first was a 56-year-old male who presented with right-side nasal obstruction and right ear fullness. The other case was a 2-year-old male child with severe snoring associated with an oropharyngeal mass. Both cases were managed successfully by powered instrument-assisted marsupialization.[6]

In our case report, the patient was a known case of primary hypertension, chronic kidney disease,

hyperuricemia, and aortic valve regurgitation. However, there is no association in the previous studies between patients' comorbidities and the risk of developing NBC. In July 2018, the patient had a prosthetic aortic valve replacement that necessitated the continuous use of warfarin postsurgically. Consequently, the patient was considered a high risk owing to the proximity of the mass to nearby vascular structures. The patient's condition was carefully optimized prior to the surgery.

Usually with the use of a contrast-enhanced MRI as the imaging modality of choice, a multicystic mass would appear hypointense on T1 and hyperintense on T2-weighted imaging without enhancement.[2] Our patient's MRI findings showed an aggregation of lymphatic tissues in the subepithelial connective tissue lined with either stratified squamous epithelium, pseudostratified ciliated columnar epithelium, or both, which is a unique distinguishing histopathological feature for the nasopharyngeal branchial cleft cyst.[2]

Various treatment modalities have been described, but the treatment of choice is complete surgical excision and marsupialization. Cyst aspiration with or without sclerosing agent's injection is another described technique. However, this carries a great risk of recurrence.[5] Total surgical excision is associated with the risk of incomplete cyst resection, a high recurrence rate, and neurovascular injury. Moreover, surgical marsupialization by means of a powered instrument has been reported as less invasive and achieves a total removal of the cyst.[6] Numerous approaches described include endonasal, transoral, transpalatal, transmandibular, and the transcervical. Even though the size, location, and the surrounding vascular structure of the cyst play a significant role, the decision on the approach is dependent on the level of safety and efficiency.[7] Verma *et al.*, who abstracted 22 cases of nasopharyngeal branchial cleft cyst in the period 1927–2000 found that the transoral approach was the most commonly followed.[8] This produced a good visualization of the cyst, less fictional loss, reduced the time of surgery and hospital stay.[7] On the other hand, Chen *et al.*, recommended the endonasal approach over the transoral approach as it was less invasive, caused less tissue damage, and provided a better cosmetic result.[5] An endonasal approach was the first consideration for our patient and therefore, a septal deviation was addressed and corrected. Complete excision using an endoscopic transoral approach was carried out in a combined approach.

Until now no studies have compared the different approaches and no agreement has been reached on which would give the best standard-of-care. The range of follow-up period in the previous case reports was 6 months to 3 years. We followed our patient for 3 months, Fortunately, no postoperative complication such as scarring, surgical site infection, or bleeding was reported and no recurrence was noted.

Conclusion

Although NBC is rare, it should be placed at the top of nasopharyngeal tumor differential diagnoses. Radiological imaging and histopathological studies are used to confirm the diagnosis. Surgical excision and marsupialization are the mainstay treatment. More cases should be reviewed to evaluate these techniques and a standardized approach agreed on.

Declaration of patient consent

The author certifies that all appropriate patient consent documents to publish the case report were obtained. The consent forms indicate that the patient gave consent for his images and other clinical information to be reported in the journal. The patient understood that his name and initials would not be published, and due effort would be made to conceal his identity, but anonymity could not be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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