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Case Report

Nasopharyngeal cyst of branchiogenic origin: a rare case report

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ABSTRACT

Nasopharyngeal branchial cysts present laterally as well as ascend from the fossa of Rosenmuller and trace superiorly inside the bony immures of the pharyngotympanic tube. Other commonly related disease conditions with respect to nasopharyngeal cyst include the Rathke's pouch cyst, Thornwaldt cyst from the pharyngeal bursa along with the branchial cleft cyst. Here in our study, we report a case of a 25-year-old male presented with symptoms of snoring for the past 2 years. On zero-degree endoscopic examination, a nasopharyngeal mass was seen arising from the lateral wall of the nasopharynx extending to the oropharynx. Further based on his radiological investigations, a localized non-enhancing nasopharyngeal cystic mass was seen extending from the left lateral wall of nasopharynx to oropharynx and was diagnosed as nasopharyngeal cyst. Thus, the surgical removal of the nasopharyngeal cyst has been performed through a transoral endoscopic technique with no remnants at the surgical site. The histopathological findings revealed stratified squamous epithelium with subepithelial infiltration of lymphoid follicles, thus confirming the diagnosis as branchial cleft cyst. The patient was discharged with no complications and have been periodically advised for a follow-up. Conclusively, the cyst of 2nd branchiogenic origin in the nasopharynx is extremely sporadic and till date, only a small number of cases have been reported.

Keywords: Nasopharynx, Nasopharyngeal cystic mass, Branchial cleft cyst, Surgery, Transoral endoscopy

INTRODUCTION

Nasopharyngeal cyst of branchiogenic origin is a rare presentation due to their distinctive attributes that segregate the congenital branchial cleft cyst amongst other cysts such as the Thornwaldt's cyst, dermoid cyst and Rathke's pouch cyst.[1] Development of cyst from the nasopharynx is generally classed into lateral and midline types with a further classification such as acquired and congenital. Thornwaldt's cyst is categorized under midline congenital cyst whereas the mucous retention cyst comes under the midline acquired cyst precisely. The differentiating feature between the above two is mucous retention cysts arise superficial to the pharyngobasilar fascia but thornwaldts cyst arises deep from the pharyngobasilar fascia. In case of a lateral nasopharyngeal cyst, the most common is branchiogenic cysts which also arise deep from the pharyngobasilar fascia (other lateral NP cyst).[2] The appearance of the nasopharyngeal cyst does not possess any definite microscopic features that distinguish them from other cysts. The histologic characteristics of branchial cleft cysts are similar to those of the pharyngeal bursa as well as Rathke's pouch wherein the branchial cleft cyst is found laterally in the nasopharynx[3] unlike the other cysts which are situated in the midline of the roof or the posterior wall.[1] A clear distinction between internal branchial cysts from other cysts of 1st, 2nd, 3rd, and 4th branchial arches is that they develop only in the pharynx.[3] The most communal form of branchial anomalies is the 2nd branchial cleft cyst, wherein the cyst exists as a fluctuant mass alongside the anterior margin of sternocleidomastoid muscle besides is hardly located in the parapharyngeal space.[4] Normally, the cystic lesion of the nasopharynx are benign and further based on their growth can lead to symptomatic conditions such as aural fullness, nasal obstruction, occipital headache, and postnasal drip.[2] The cyst might extend inferiorly into the oropharynx to cause obstructive symptoms.[5] The lining of

nasopharyngeal branchial cysts comprise of the pseudostratified squamous epithelium as well as stratified squamous epithelium or even both.[2] The definitive treatment of choice for branchial cleft cyst of nasopharynx is the complete surgical removal whereas the other treatment method comprises of transoral laser marsupialization.[5] In our case report, we primarily focus on the nasopharyngeal branchial cleft cyst which is a unique presentation with a minimal prevalence that delineates from the commonly noticed second branchial cleft cyst with a higher incidence rate precisely.

CASE REPORT

A 25-year-old male complained of snoring for a duration of two years, almost every night with a history of running nose, and sneezing on and off for one year with a frequency of fewer than 4 days per week. Chief complaints of voice change involve the hyponasal voice. No history of nasal obstruction, anosmia, or hyposmia and no unusual family history. No history of any addictions.

On oral cavity and oropharynx examination with a headlight and a tongue depressor, a smooth cystic whitish mass was seen behind the uvula more towards the left side (Figure 1a).

On nose examination, deviated nasal septum to the left side of the nasal cavity with spur impinging on the left inferior turbinate was visualized. 0-degree diagnostic nasal endoscopy examination revealed a smooth whitish globular mass of size 2×3 cm having a broad base connection to the posterior and left lateral wall of the nasopharynx close to the left fossa of Rosenmuller (Figure 1b). On the 70-degree video laryngoscopic examination revealed a normal vocal cord status with good glottic chink.

On otoendoscopy examination, the external auditory canal and the tympanic membrane were normal. Contrast-enhanced computed tomography showed a localized non-enhancing nasopharyngeal cystic mass extending from left lateral wall of nasopharynx till oropharynx just behind the uvula (Figure 2). causing airway narrowing features that are in favour of nasopharyngeal mucous retention cyst. There was no bony erosion. The patient had been planned for excision biopsy, using zero-degree endoscope wherein the mass will be removed transorally assisted by an endonasal approach. Moreover, intraoperatively anterior wall of the mass had been cauterized using suction cautery intranasally to reduce the bleeding. Boyle Davis mouth gag applied, using turbinectomy scissors mass is excised trans-orally and had been sent for histopathological examination. Using an angled microdebrider, the residual mass has been removed. The left side eustachian tube opening was delineated. No active bleeding of blood was noted. The patient recovered and was shifted to the surgical intensive care unit. During the post-operative period, there was no active bleeding. The histopathology report confirmed the cyst as a branchial cleft cyst is lined by stratified squamous epithelium with subepithelial infiltration of lymphoid follicles (Figure 4).

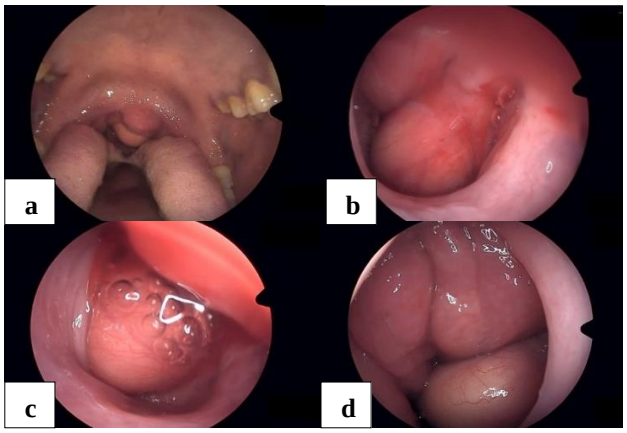

Figure 1: (a) View of the oral cavity and oropharynx showing the nasopharyngeal mass protruding into the oropharynx; (b and c) DNE view through the left nasal cavity showing the nasopharyngeal mass attached to the left nasopharyngeal wall (b) before and (c) after swallowing; and (d) DNE view through the right nasal cavity showing the fundus of the mass in the nasopharynx.

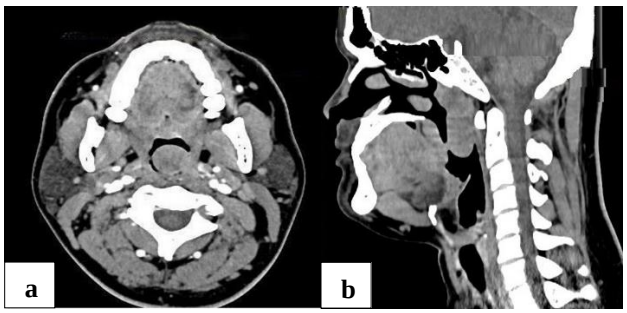

Figure 2: (a) Axial and (b) sagittal view of computed tomography (CT) scan of the PNS showing a localized non-enhancing nasopharyngeal cystic mass extending from the left lateral wall of the nasopharynx to the oropharynx.

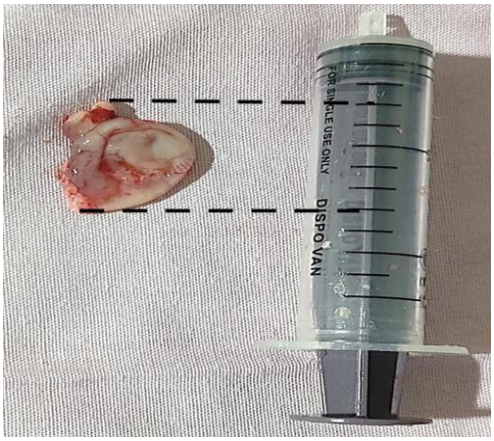

Figure 3: Excised nasopharyngeal cyst.

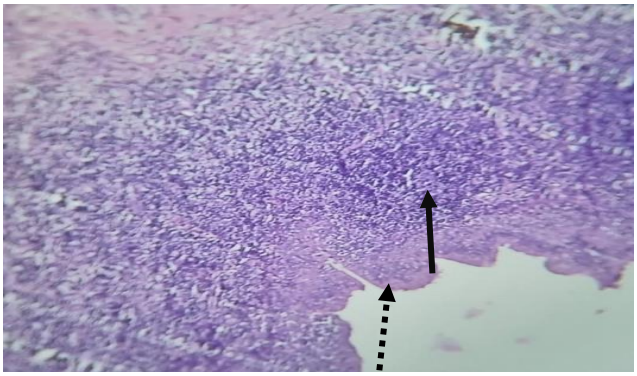

Figure 4: Histopathological images of the cyst wall with magnification (10x) showing a stratified squamous epithelium (dotted arrow) with subepithelial infiltration of lymphoid follicles (plain arrow).

DISCUSSION

Nasopharyngeal congenital cysts of branchiogenic origin are unusual in presentation. Emphasizing the two theories which has been hypothesized to explain the cause of internal branchial cysts. The first hypothesis proposes that the cyst is a derivative of ectopic epithelial cells in regional lymph nodes wherein it suggests the existence of sub-epithelial lymphocytes in the branchial cyst wall. The second hypothesis reminds us of the cyst which originates from remnants of branchial apparatus that presents neither as sinus tract, cyst nor fistula. Generally, the second hypothesis is more widely acknowledged. But still, the debate concerning which pouch donates to the development of internal branchial cysts is present. The merging of the dorsal portion of the 2nd branchial pouch with the 1st pouch is the due cause of this condition. Reports have suggested that in the absence of anomalies in the first pouch, the most likely origin of the branchial cyst is from the second branchial pouch. Focusing on the above-mentioned hypotheses, our case report on nasopharyngeal branchial cleft cyst is found to be a second branchial apparatus derivative.[1] The main differentiating feature between the nasopharyngeal branchial cleft cyst and the other nasopharyngeal cysts is the site of origin within the nasopharynx. The nasopharyngeal branchial cleft cyst typically arises from the lateral wall of the nasopharynx. The investigation of choice for early diagnosis of a branchial cleft cyst and to differentiate it from other cysts is computed tomography (CT) and magnetic resonance imaging (MRI). In our case, contrast enhanced CT (CECT) of the nose and paranasal sinuses alone was sufficient to arrive at the diagnosis and check the extent and site of origin of the cyst, and to rule out the involvement of skull base structures. Endoscopic guided complete surgical removal is the management of choice for branchial cleft cysts. Moreover, the contents of the cyst are clear, mucinous, or maybe seromucinous fluid. In our case report, we used an endoscopic guided transoral approach to excise the nasopharyngeal cyst. The benefits of using this method are that it's much safer and significantly less invasive in contrast to transnasal and transpalatal techniques and there is no need for suture removal post-surgery.[2] The duration of hospital stay is also less as endoscopic transoral excision of the cyst is done as a day care procedure.

Concentrating on the histopathology of the branchial cleft cyst which may alter their morphological characteristics from either single or stratified squamous columnar epithelium in conjunction with cilia or without cilia towards the squamous epithelium lining wherein the subepithelial lymphocytic permeation have also been noticed. In contrast, a histopathological finding of tonsil and adenoid shows the deficiency of the cyst wall of the epithelial lining.[2]

CONCLUSION

The branchial cleft cyst of nasopharynx is a rare presentation that is classed as the 2nd branchial cleft cyst. The treatment of choice is the surgical excision via an endoscopy-guided transoral approach. Relapse of the nasopharyngeal cyst of branchiogenic origin is exceptionally uncommon, wherein the complete removal of the cyst is warranted.

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