



A CASE SERIES OF BRANCHIAL CLEFT CYST

ENT

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ABSTRACT

Branchial cleft cysts are the most common congenital neck masses. The other name for branchial cleft cyst is benign cervical lymphoepithelial cyst, which occurs on the lateral aspect of the neck. These cysts originate from remnants of the branchial arches or branchial pouches. We describe a series of 3 cases of second branchial cleft cyst. One was misdiagnosed as cervical lymphadenopathy in USG and later FNAC and CT revealed a branchial cyst. Another is a case report of a 52 year old female patient with branchial cyst. Branchial cysts are common in young adult setting. We report this case for its presentation in unusual age. In older adults with this presentation, it is important to exclude metastatic lymphadenopathy, lymphoma or tuberculosis.

KEYWORDS

Branchial cyst ,congenital, second branchial arch.

INTRODUCTION:

Branchial cleft cysts are the most common congenital neck masses, which occurs on the lateral aspect of the neck. It was first described by Hunczovsky in the year 1785.^[1] These cysts originate from remnants of the branchial arches or branchial pouches. The branchial cleft cyst is a developmental cyst of the lateral neck region^[2]. These anomalies present as cysts, sinuses and fistulae. Branchial cleft cysts comprise approximately 75% to 80% of all branchial anomalies. 95% of these cysts are believed to arise from the second branchial arch.^[3] 5% originating from first, third and fourth branchial arches. The most common site is upper lateral neck along the anterior border of sternocleidomastoid muscle and usually presents as an asymptomatic circumscribed movable mass.^[3]

Case Report :1

A 24 year old male patient presented with complaints of swelling in the right side of neck for 1 month. The swelling increased in size gradually. H/o fever and upper respiratory tract infection was present. There was no c/o increase in size on straining, no h/o pain, no h/o breathing difficulty, no h/o voice change, no h/o difficulty in swallowing. On examination a **5*4 cm** size swelling noted in the right side of neck anterior to the right sternocleidomastoid muscle. Swelling was **warm and tender** on touch. It was single, tense cystic, smooth surfaced, not fixed, fluctuating, not pulsatile and not transilluminating in nature. It does not move with deglutition, nor with protrusion of tongue. Oral cavity and oropharyngeal examination was done and no obvious lesions noted. Video laryngoscopy and diagnostic nasal endoscopy showed no abnormalities.



Fig 1. Pre-op Picture Of The Swelling

Ultrasound of the neck diagnosed as cervical lymphadenopathy.

FNAC was done and the swelling was diagnosed as branchial cyst.

Contrast enhanced computed tomography of neck revealed a well defined cystic lesion of **3.6*2.6*4.4 cm** with internal septation noted between right internal carotid artery and right parotid gland abutting

right sternocleidomastoid with mild peripheral enhancement. Multiple nodes noted in bilateral cervical region.

1. Branchial Cyst

2. Necrotic node.

Magnetic resonance imaging of neck showed well defined predominantly cystic lesion in right upper deep neck lateral to internal jugular vein, carotid bifurcations, internal carotid artery, external carotid artery. Right Internal jugular is compressed. No arterial feeders to the swelling. **Infective type 2 Branchial cyst.**

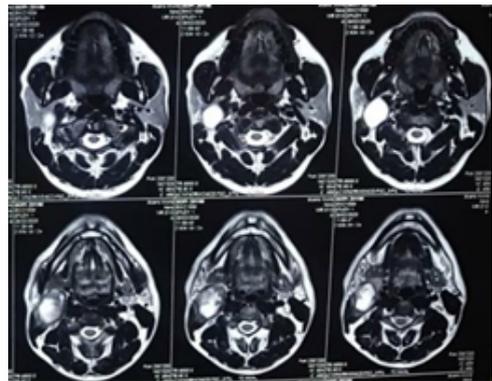


Fig.2: MRI Showing Extent And Boundaries Of Swelling.

After routine preop investigations, anaesthetic fitness and consent for surgery the cyst was excised and sent for histopathological examination.

Fibrocartilagenous tissue enclosing cystic lesion lined by stratified squamous epithelium and surrounded by inflammatory cells, islands of foamy macrophages, multi nucleated giant cells, cholesterol clefts surrounding stroma also shows lymphoid collection with germinal centre and fibrovascular fatty tissue. It was consistent with infected branchial cyst.



Fig3. Specimen After Excision

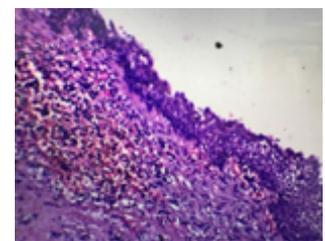


Fig.4 Histopathological Slide

Case Report 2 :

A 52 year old female presented with swelling in the left side of the neck for past 2 months. It was painless, gradually increasing in size .On examination, single swelling of 6*4 cm noted in left side of neck . It was not warm and tender on touch, smooth surfaced, fluctuating, not fixed and not transilluminating. it does not move with deglutition, nor with protrusion of tongue. Video laryngoscopy and diagnostic nasal endoscopy showed no abnormalities.

USG neck revealed a 4 x 3.4 x 4.2 cm cystic lesion.



Fig.5 Pre Op Picture Of The Swelling

CT scan neck revealed a well defined non enhancing cystic lesion of 4.3 x 3.1 x 5.1 cm, cystic swelling suggestive of type II branchial cleft cyst (left). FNAC revealed as branchial cyst. After routine preop investigations , anaesthetic fitness and consent the cyst was excised. Histopathology revealed that cyst wall was lined by flattened epithelium underlying fibrovascular connective tissue and diffuses infiltrates with lymphocytes. It was consistent with branchial cyst .

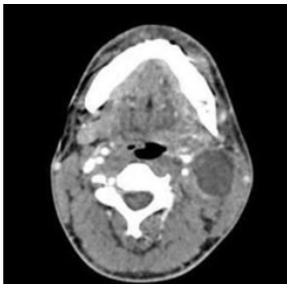


Fig.6 CT Image Of The Cyst

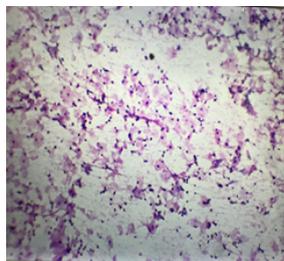


Fig.7 Histopathological Slide

Case Report 3

A 19 year old male presented with swelling in the right upper part of the neck for past 3 weeks.It was painless, gradually increasing in size. On examination: single swelling of 5*3 cm noted in right anterior triangle of neck . There was no warmth and tenderness. The swelling was firm in consistency, fluctuating, not fixed and not transilluminating. The skin over the swelling was normal. It does not move with deglutition, nor with protrusion of tongue. Video laryngoscopy and diagnostic nasal endoscopy showed no abnormalities. CT scan neck revealed a 5x 3.6 x 3.0 cm, well defined cystic swelling in the right submandibular region. **USG guided FNAC** reported the swelling to be consistent with a Branchial cyst.

After routine preop investigations, anaesthetic fitness and consent the cyst was excised. Histopathology was consistent with branchial cyst .

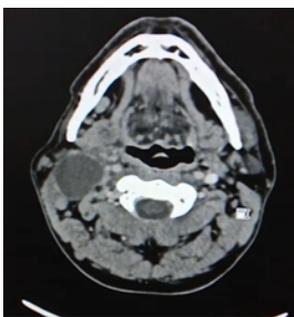


Fig :8 CT Image Of The Swelling



Fig :9 Specimen After Excision

DISCUSSION

Branchial cleft cyst is a soft tissue swelling usually seen in the neck of

young adults. It is also termed as congenital hydrocele of the neck, lateral lymphoepithelial cyst.^[4] True branchial cyst is above the hyoid bone. Defects below the hyoid bone may be located at any level in the neck including nasopharynx.^[5]

ETIOPATHOGENESIS

The etiopathogenesis of branchial cleft cyst is controversial. It has four main theories of origin. The etiological hypotheses are as follows:

1. Congenital theories: The classic theory that the cyst develops from remnants of the embryonic gill apparatus.
- 2.Lymph node theories: In 1949, King concluded that the cyst arises from cystic changes in parotid epithelium that becomes entrapped in the upper cervical lymph nodes during embryonic life.
- 3.Branchial theory: Cyst develops from imperfect obliteration of the pharyngeal cleft.
- 4.Pre-Cervical Sinus Theory: The cyst develops from remnants of the cervical sinus^[6]

EMBRYOLOGY

During embryogenesis at the 4th week of embryonic life, the development of 4 branchial (or pharyngeal) clefts results in 5 ridges known as the branchial (or pharyngeal) arches, which contribute to the formation of various structures of the head, neck, and thorax. The second arch grows caudally and ultimately covers the third and fourth arches. The buried clefts become ectoderm-lined cavities, which normally involute around week 7 of development. If a portion of the cleft fails to involute completely, the entrapped remnant forms an epithelium-lined cyst with or without a sinus tract to the overlying skin.^[7]

CLINICAL PICTURE

Second branchial cleft cysts makes up approximately 95% of all branchial anomalies. They are classified into four subtypes, as follows^[8]

- 1.type 1: situated anterior to sternocleidomastoid ,just deep to platysma.
- 2.type 2: most common variant of four types , found deep to the sternocleidomastoid, lateral to the carotid space,
- 3.type 3: these extend medially between the bifurcation of internal and external carotid arteries up to the lateral pharyngeal wall,
- 4.type 4: positioned in the pharyngeal mucosal space, medial to the carotid sheath

They gradually progress in size, and may become painful or tender with time if they are subsequently infected^[9] .

Diagnosis of the condition becomes relatively easy when the location is in its classic position. USG shows an anechoic mass or chiefly hypoechoic cystic mass, with faint internal debris and posterior enhancement. On a CT scan, the cyst usually appears as a well-circumscribed, non-enhancing mass of homogeneous low attenuation surrounded by uniformly thin wall. The mural thickness increases during infection^[10]. MR imaging better depicts the deep tissue extent of a second branchial cleft cyst, which allows accurate preoperative planning. The cyst fluid varies from hypointense to slightly hyperintense relative to muscle on T1-weighted images and is usually hyperintense on T2-weighted images ^[11]. FNAC is very helpful in preoperative diagnosis. The criteria for FNA cytology diagnosis of branchial cyst are: a) thick, yellow, turbid fluid b) anuclear, keratinizing cells c)squamous epithelial cells of variable maturity and d) a back ground of amorphous debris.^[12] Aspirate appears as a straw-colored fluid, that microscopically may exhibit squamous cells, polymorphonuclear cells, lymphocytes and cholesterol crystals. Histopathologic picture of branchial cysts are usually filled with a turbid, yellowish fluid that may contain cholesterol crystals^[9]. Complete excision of the cyst is necessary. No recurrence has been noted.

CONCLUSION:

Branchial cyst should be suspected in any patient with a swelling or a tumor in the lateral part of the neck, painful or painless. Second branchial anomalies are frequently diagnosed in persons belonging to the first and second age decades. There is no gender predisposition. Second branchial cysts have variable sonographic appearances, which may confuse the inexperienced. In the absence of a clear result, CT and MRI are very useful in demonstrating the cystic nature and the anatomical extensions of branchial anomalies. The histopathological examination establishes confirmative diagnosis. The treatment of branchial anomalies is complete surgical excision. These cases are reported for its variable sonographic appearances which mislead to the diagnosis and later CT imaging

revealed it as infected branchial cyst and the other case has been presented for its rarity in age of presentation because branchial cysts usually occurs in young adults.

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