

Branchial Cyst: A Case Report

Hemantkumar Gopal Borse^{1*} and Usha Vaswani²

¹Professor, Department of Surgery, Dr. Vasantrao Pawar Medical College, Hospital and Research Centre, Nashik - 422003, Maharashtra, India; drhborse@gmail.com

²PG Resident, Department of Surgery, Dr. Vasantrao Pawar Medical College, Hospital and Research Centre, Nashik - 422003, Maharashtra, India; vaswani_usha@yahoo.com

Abstract

Branchial cyst is a rare developmental disorder which is diagnosed rarely. Remnants of Branchial are present at birth but may become clinically significant later in life. We report a case of 14-year-old male patient with an asymptomatic branchial cyst over lateral side of neck. These cyst originate from remnants of branchial arches or branchial pouches. The definitive treatment of is complete surgical excision of the cyst. Complete surgical excision prevents recurrence or other complications.

Keywords: Branchial Anomalies, Branchial Cyst, CT Scan

1. Introduction

Branchial apparatus help in development of head and neck structures. Abnormal development of these structures leads to formation of branchial anomalies. In children presenting with cervical swelling, Branchial anomalies will be present in 17% of the cases. These include branchial cyst, branchial fistula, and branchial sinuses. They are bilateral in about 1% of cases¹. 2nd cleft gives rise to almost 95% of the abnormalities. Branchial

cyst is common (about 75%)². Incidence of first branchial cleft anomalies is estimated to be about one per million's population/year⁴. Failure of obliteration of branchial cleft results in branchial cyst³. The different theories proposed for branchial anomalies are thymopharyngeal theory, cervical sinus theory and the most commonly used inclusion theory. The treatment of branchial cyst is complete surgical excision (Figure 1).

2. Case Report

A 14-year-old male patient admitted to surgery department of Medical College and tertiary care hospital. He presented with a single oval painless, cystic swelling over lateral side of neck since childhood. There was no history of Kochs or Kochs contacts, no history of trauma to site. There was no history suggestive of respiratory tract infection, ear discharge. History of gradual increase in size of the swelling.

2.1 On investigations Hemoglobin was 10.3g/dl; WBC 5000

CT scan neck showed a well-defined rounded hypodense non-enhancing lesion (23x23 mm) on left side of



Figure 1. CT scan showing cystic swelling in the right.

*Author for correspondence

neck, below angle of mandible along antero-medial border of sternocleidomastoid muscle and posterior to submandibular gland, lateral to carotid space s/o Branchial Cyst.

2.2 FNAC of Swelling was Suggestive of benign Mucinous Cystic Lesion

Complete excision of cyst done under general anesthesia. Histopathology report showed cyst lined by columnar pseudostratified columnar epithelium and presence of mixed inflammatory infiltrate. There was no evidence of malignancy. The features were consistent with Branchial cleft cyst.

Post-operative course in the wards was uneventful. The patient was discharged on 7th post-operative day. He was followed up for a period of three months. There were no post-operative complications (Figure 2).



Figure 2. Intra operative photographs of the branchial cyst.

3. Discussion

Branchial cyst frequently affects young adults and appears as soft fluctuant mass. It is associated with recent

upper respiratory tract infection, odontogenic infection or even in pregnancy.

The first branchial cleft forms the Eustachian tube and tympanic membrane and the external auditory canal. Palatine tonsil and tonsillar fossa is formed develops from the second branchial pouch. From the third branchial pouch inferior parathyroid, thymus and pyriform fossa formed. Superior parathyroid gland and apex of pyriform sinus develops from the fourth pouch.

There are four theories for the etiology of branchial cyst. Incomplete obliteration of branchial clefts, the persistence of vestiges of pre-cervical sinus rather than pharyngeal clefts, cystic degeneration of cervical lymph nodes and remnants of gill apparatus. Bailey and colleagues classified 4 types of branchial cleft cysts^{5,6}:

Type 1 cysts are situated below the platysma muscle. These cysts are antero-lateral to sternocleidomastoid muscle. They are located near external auditory canal inferior and posterior to tragus or may be arising from the parotid gland.

Type 2 cysts are situated anterior to sternocleidomastoid muscle, lateral to carotid space and posterior to submandibular gland. These cysts are associated with submandibular gland and are seen in the neck in anterior triangle.

Type 3 cysts from the lateral pharyngeal wall it extends between the bifurcation of internal carotid artery and external carotid artery on the medial side.

Type 4 cyst lies against lateral pharyngeal wall. They may extend to skull base. It is the least commonest.

Pathological Characteristics: Branchial cyst fluid aspirate contains turbid, yellowish fluid. The fluid contains cholesterol crystals. The walls of branchial cyst thin. The wall is lined with stratified squamous epithelium overlying lymphoid tissue and occasionally contains columnar respiratory epithelium⁷.

Ultra sonography can help provide useful information about the position of the cyst and connection with other structures⁸. On CT Scan imaging of the neck these cysts appear as well circumscribed. the cyst is homogeneously hypoattenuated and is surrounded by thin wall. MRI delineates the deep tissue extent of the branchial cyst and helps in planning surgical excision⁹. On MRI on T1 images cyst fluid appears hypointense relative to muscle and on T2 images the lesion appears hyperintense.

According to a study conducted¹⁰ in 1992 most of the branchial cleft anomalies arise from the second branchial cleft (92.45%) and 4.72% arise from first arch and third (1.87%) and fourth arch (0.94%). Bajaj et al., in their studies conducted on 80 patients in 2011 reported a higher incidence of second branchial anomalies (78%)¹¹.

4. Conclusion

Branchial anomalies remain asymptomatic and can present later in life. They can be incorrectly diagnosed. It is mandatory to confirm the extent of the tract before surgery is contemplated. CT scan and MRI neck are helpful in diagnosis of cyst and its anatomical extensions. A proper history and physical examination is required to look for other anomalies like craniofacial syndromes or Brachio-oto renal syndromes. The treatment of branchial cyst is complete surgical excision to prevent recurrence. Acute inflammation should be treated with antibiotic therapy, incision and drainage. It should be followed by complete excision to prevent recurrence.

5. References

1. Doshi J, Anari S. Branchial cleft side predilection: Fact or fiction? *Ann. Otol. Rhinol. Laryngol.* 2007; 116(2):112-14. <https://doi.org/10.1177/000348940711600206>. PMID: 17388234.
2. Telander RL, Filston HC. Review of head and neck lesions in infancy and childhood, *Surg. Clin. North Am.* 1992, 72(6):1429-47. [https://doi.org/10.1016/S0039-6109\(16\)45889-5](https://doi.org/10.1016/S0039-6109(16)45889-5).
3. Golledge J, Ellis H. The aetiology of lateral cervical branchial cysts: Past and present theories, *J. Laryngol. Otol.* 1994; 108(8): 653-59. <https://doi.org/10.1017/S0022215100127744>.
4. Anesi A, Pollastri G, Bondi V. Absence of adjuvant radiotherapy may be additional criteria in diagnosing a branchiogenic squamous cell carcinoma: A case report, *OJST.* 2012; 2:63-7. <https://doi.org/10.4236/ojst.2012.21012>.
5. Bailey H. Branchial cysts and the essays on surgical subjects of facio-cervical region, Lewis, London, 1929.
6. Chun Rh, Choi SS. First branchial cleft cyst: A rare presentation with mesotympanic extension, *Int. J. Pediatr. Otorhinolaryngol Extra.* 2009; 4:80-83. <https://doi.org/10.1016/j.pedex.2008.08.001>.
7. Chen H, Li M, Lin T. Branchial cleft cyst carcinoma: A case report, *Chin J. Radiol.* 2005; 30:231-34.
8. Gritzmman N, Hollerweger A. Sonography of soft tissue masses of the neck, *Clin. Ultrasound.* 2002; 30:356-73. <https://doi.org/10.1002/jcu.10073>. PMID:12116098.
9. Wang J, Takashima G, Van Bruggen N et al. Head and neck lesions: Characterization with diffusion weighted echo-planar MR imaging, *Radiology.* 2001; 220:621-30. <https://doi.org/10.1148/radiol.2202010063>. PMID:11526259.
10. Ford GR, Balakrishnan A, Evans JNG. Branchial cleft and pouch anomalies, *Journal of laryngology. and Otolology.* 1992; 106(2):137-43. <https://doi.org/10.1017/S0022215100118900>.
11. Bajaj Y, Ifeacho S, Tweedie D. et al. Branchial anomalies in children, *International Journal of Pediatric Otorhinolaryngology,* 2011; 75(8):1020-23. <https://doi.org/10.1016/j.ijporl.2011.05.008>. PMID: 21680029.

How to cite this article: Borse HG, Vaswani U. Branchial Cyst: A Case Report. *MVP J. Med. Sci.* 2019; 6(1):100-102.