Unravelling the Enigmatic: A Case Report on Type 1 Infected first Branchial Cyst and Surgical Management

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Abstract: Type 1 first Branchial cysts are uncommon congenital anomalies that often pose diagnostic challenges due to their varied presentations and potential for misidentification. We present a case report of a patient diagnosed with a type 1 first Branchial cyst, discussing the clinical manifestation, diagnostic approach, and successful surgical management. A 52-year-old female presented with a painful, recurrent, fluctuant swelling in the left lateral neck region, which was initially misdiagnosed as an infected lymph node. Imaging studies revealed a cystic lesion possibly arising from Parotid gland. Surgical excision was performed, and Histopathological examination confirmed the diagnosis of a type 1 first Branchial cyst. This case emphasizes the importance of considering Branchial anomalies in the differential diagnosis of lateral neck masses and highlights the significance of accurate diagnosis and timely surgical intervention for optimal patient outcomes.

Keywords: Type 1 Branchial cyst, lateral neck mass, congenital anomaly, Cysts, First Branchial

Introduction:

Type 1 first Branchial cysts are rare developmental anomalies originating from remnants of the first Branchial arch. Type 1 first Branchial cysts, are among the least common variants, constituting 1-4% of all Branchial anomalies [1]. The occurrence of infection within these cysts is an infrequent complication, further complicating their clinical course and management in reference to present case [1]. These cysts often present diagnostic challenges due to their variable clinical presentations, which can mimic other neck masses, including lymphadenopathy, Parotid masses, Thyroglossal duct cysts, or Cystic hygromas. Herein, we describe a case of a type 1 first Branchial cyst in an adult patient and discuss the diagnostic process, surgical intervention, and Histopathological findings.

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Case Presentation:

A 52-year-old female presented to our outpatient department with a painful, recurrent swelling in the left lateral neck region for the past 3-4 years. Patient had undergone Incision and drainage multiple times for the recurrent Abscess. Physical examination revealed a cystic, tender, mobile mass measuring approximately 3 cm in diameter, located anterior to the Sternocleidomastoid muscle. Initially, the lesion was misconstrued as an infected lymph node, and a course of empirical antibiotics was prescribed without significant improvement.

Due to persistent swelling and diagnostic uncertainty, the patient underwent imaging studies, including Ultrasound and Contrast-enhanced Magnetic resonance imaging (MRI) of the neck. Imaging revealed a well-defined, cystic lesion adjacent to the left Sternocleidomastoid muscle, confirming the presence of a cystic mass possibility of arising from Parotid gland, shown in Figure 1. The radiological findings were suggestive of a “Parotid swelling”, prompting further evaluation and surgical intervention. Fine needle aspiration cytology (FNAC) aspirated pus and reported Infected lesion.

A Superficial Parotidectomy was planned. On table, Surgical excision of the cystic lesion was performed under general anaesthesia. Post aural incision given and a careful dissection of cyst was carried out to identify and preserve adjacent structures (figure 2). Intraoperatively, the cyst was found to be separate from the Parotid gland. A part of cyst was found to be going deep to External auditory canal (Figure 3). Cyst was closely associated but lateral to the Facial nerve and was successfully dissected without causing any nerve injury. The excised specimen was sent for Histopathological examination.

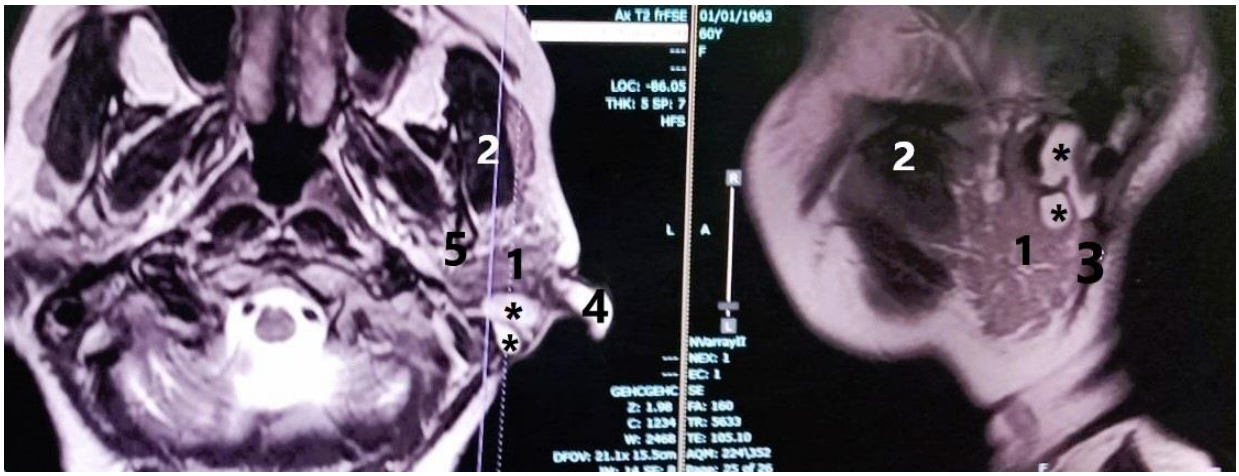

Figure 1 MRI scan Neck showing cyst and surrounding structures on T2 images in Axial and Sagittal sections (*- cyst, 1- Parotid gland, 2- Masseter muscle, 3- Sternocleidomastoid muscle, 4- Pinna, 5- Mandible) (Cystic lesion possibility of arising from Parotid gland lateral and superficial to Sternocleidomastoid muscle, part of it going deep below External Auditory Canal)

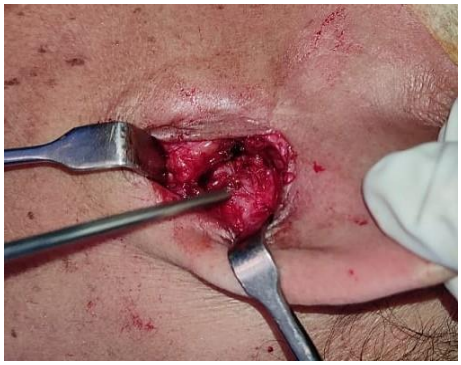

Figure 2 Intraoperative Image showing Forceps holding the cyst seen in post Aural Incision.

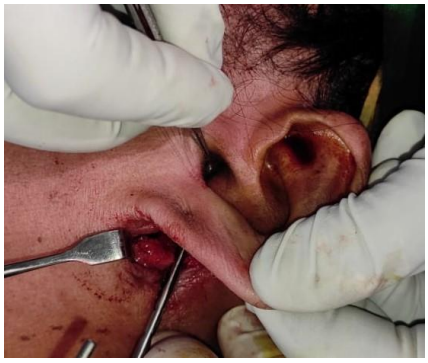

Figure 3 Intraoperative image showing Probe protruding into the External Auditory canal after cyst removal through operative site.

Histopathological examination revealed a cystic structure lined by stratified squamous epithelium, confirming presence of ectodermal tissue (Figure 4). The Histopathologic slide with clinical appearance confirm the diagnosis of a type 1 Branchial cyst.

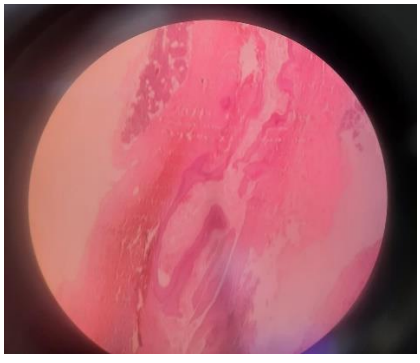

Figure 4 Histopathologic view of cyst (H&E stain, magnification 10x, the microscopic image shows Cystic structure lined by non-keratinised stratified squamous epithelium and underlying connective tissue. The Cystic epithelium is thrown into folds at various places. The epithelium is 6-8 layered thick. The underlying connective tissue shows some lymphoid tissue, fibrous tissue with fibroblast and blood vessels)

Postoperative recovery was uneventful, with no recurrence of the swelling observed during follow-up visits.

Discussion:

Incomplete involution of Branchial cleft structures forms Branchial cleft anomalies. During the fourth week of gestation, six pairs of Branchial (Pharyngeal) arches commence their development as Neural crest cells migrate into the prospective Head and neck region. These arches, numbering five in total, are demarcated from each other by depressions termed Clefts. These Clefts manifest on the ectodermal surface, while their corresponding pouches are discernible on the endodermal surface [2].

First Branchial cleft cysts constitute a proportion ranging from 5% to 25% of all Branchial cleft anomalies [3]. They have been categorized into two types based on their characteristics by Arnot [4]. The cysts are called Arnot Type I cysts, which originate from ectodermal tissue, typically present clinically as preauricular masses or sinuses located anterior and medial to the external auditory canal. These cysts are situated lateral to the facial nerve and terminate within the external auditory canal, occasionally exhibiting as duplication of the canal. On the other hand, Arnot Type II cysts encompass both ectodermal and mesodermal components and are more prevalent. These cysts typically manifest at the mandibular angle or within the submandibular region [3].

Clinically, both the types of first Branchial cysts, often manifest as painless, gradually enlarging masses in the lateral neck, posing a diagnostic challenge due to their resemblance to other neck pathologies [5]. The most common age of presentation is second and third decade of life [6]. The low level of diagnostic precision primarily stemmed from misinterpretations such as cervical abscess, neoplastic lymph node, cold abscess, and similar conditions [7].

Accurate diagnosis typically entails a comprehensive clinical evaluation, complemented by Fine Needle Aspiration Cytology (FNAC) and imaging modalities such as Ultrasound, CT, or magnetic resonance imaging (MRI). However, precise diagnosis through imaging can be challenging due to the proximity of multiple adjacent structures. Surgical excision remains the cornerstone of treatment, aiming for complete excision while preserving vital adjacent structures [8].

Conclusion:

This case highlights the diagnostic dilemma associated with type 1 first Branchial cysts and emphasizes the importance of considering these anomalies in the differential diagnosis of lateral neck masses. Timely recognition, accurate diagnosis, and meticulous surgical excision

are crucial for optimal management and favourable outcomes in patients with such rare congenital anomalies. The present case signifies the value of keeping in mind the congenital anomalies presentation at old age.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.