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Unusually rapid development of a lateral neck mass: Diagnosis and treatment of a branchial cleft cyst. A case report



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ABSTRACT

INTRODUCTION: Branchial cleft cysts are benign lesions caused by anomalous development of the branchial cleft. Cases that arise in the lateral neck region are often misdiagnosed, resulting initially in inappropriate management.

CASE PRESENTATION: We describe a 32-year-old woman with a swelling on the right side of her neck and no pain during palpation or neck motion.

DISCUSSION: The patient was evaluated using fine-needle aspiration cytology (FNAC), ultrasound, and magnetic resonance imaging (MRI) scans. The MRI showed a right-sided cervical mass with hyperintense content, well-defined margins, and no evidence of infiltration into surrounding structures, while FNAC found a yellow, pus-like fluid, keratinised anuclear cells, squamous epithelium, and a matrix of amorphous debris.

CONCLUSION: Based on the images and the patient's symptoms, a surgical intervention was performed.

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1. Introduction

Branchial anomalies are uncommon, benign lesions that result from altered development of the branchial apparatus during embryogenesis, between the second and seventh weeks of foetal life. Persistence of branchial remnants can lead to the development of cysts, sinuses, fistulas, and islands of cartilage [1]. Anomalies of the second branchial cleft are the most common cause of neck masses of this type, accounting for ~90% of all cases [2].

To date, various cases originating in the lateral neck region have been reported. However, none was of the size of this case or showed rapid development. In 1955, Proctor [3] described four classes of branchial cleft cyst, revising the first classification of Baley (1929):

- type I: deep to the **platysma**, anterior to the sternocleidomastoid (SCM).
- type II: abutting the **internal carotid artery and adherent to the internal jugular vein (most common)**.
- type III: **extending between the internal and external carotid arteries**

- type IV: **abutting the pharyngeal wall and potentially extending superiorly to the skull base**.

Here, we report a case, with a particular focus on the histopathological, radiological, and clinical aspects.

2. Case report

A 32-year-old woman was referred to the outpatient unit of the Maxillo-Facial Surgery Department, with a right-sided neck swelling of 15 days duration, no limitation on mouth opening, and no pain aggravated by palpation of the region. There was no history of trauma or any other event contributing to the onset of the symptoms.

A physical examination did not reveal nerve paralysis, or hearing, facial, or neck sensation disturbances, but a mobile, not tender but compressible mass was detected in the right neck region with normal skin overlying the swelling (Fig. 1). There was no dysphagia, dysphonia, or dyspnoea.

Ultrasound, which is the first-line imaging method of choice for defining the nature of a benign cystic lesion, revealed a mass of about 7 × 4 cm, a sharply demarcated lesion with posterior acoustic enhancement associated with imperceptible walls; the cyst was hypoechoic with internal debris. The cervical lymph nodes were not pathologic. The relation between the mass and the vascular

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Fig. 1. Clinical view of the patient.



Fig. 2. Magnetic resonance imaging coronal and axial views of the lesion.

bundle was not clear. To plan the surgical procedure, magnetic resonance imaging (MRI) was performed. This revealed a cystic lesion, the content of which was hyperintense in T2-weighted sequences and mildly hyperintense in T1-weighted sequences. The lesion appeared extrinsic to the SCM and showed no sign of infiltrating nearby structures (Fig. 2). The mass caused posterior displacement of the SCM and pressure on the vascular bundle, compressing it. Fine-needle aspiration cytology (FNAC) was performed, revealing a pus-like fluid, with keratinised anuclear cells, squamous epithelium, and a matrix of amorphous debris. Because ultrasound, MRI imaging and FNAC all indicated a benign lesion, no exploratory biopsy was performed.



Fig. 3. Intraoperative view of the cervical approach during removal of the lesion.



Fig. 4. Macroscopic image of the lesion.

A surgical intervention was performed under general anaesthesia using a right transverse cervical approach. Incision was followed by exposure of the platysma with careful dissection of the surrounding structures (Fig. 3). The lesion was removed completely.

Macroscopically, the specimen showed an oval form of 7×4 cm (Fig. 4). When cut, the lesion was found to contain a brownish, creamy material and have smooth inner walls. Microscopy showed that the lesion had a cyst wall with a stroma of the lymphoid type, covered by squamous epithelium without atypia (Fig. 5a–f). These histopathological findings resulted in a diagnosis of a branchial cyst and, due to its position, we deemed it a second-class cyst. The follow-up period is currently 18 months.

3. Discussion

A branchial cleft cyst is a common cause of soft tissue swelling in the neck of a young adult; it generally occurs unilaterally and

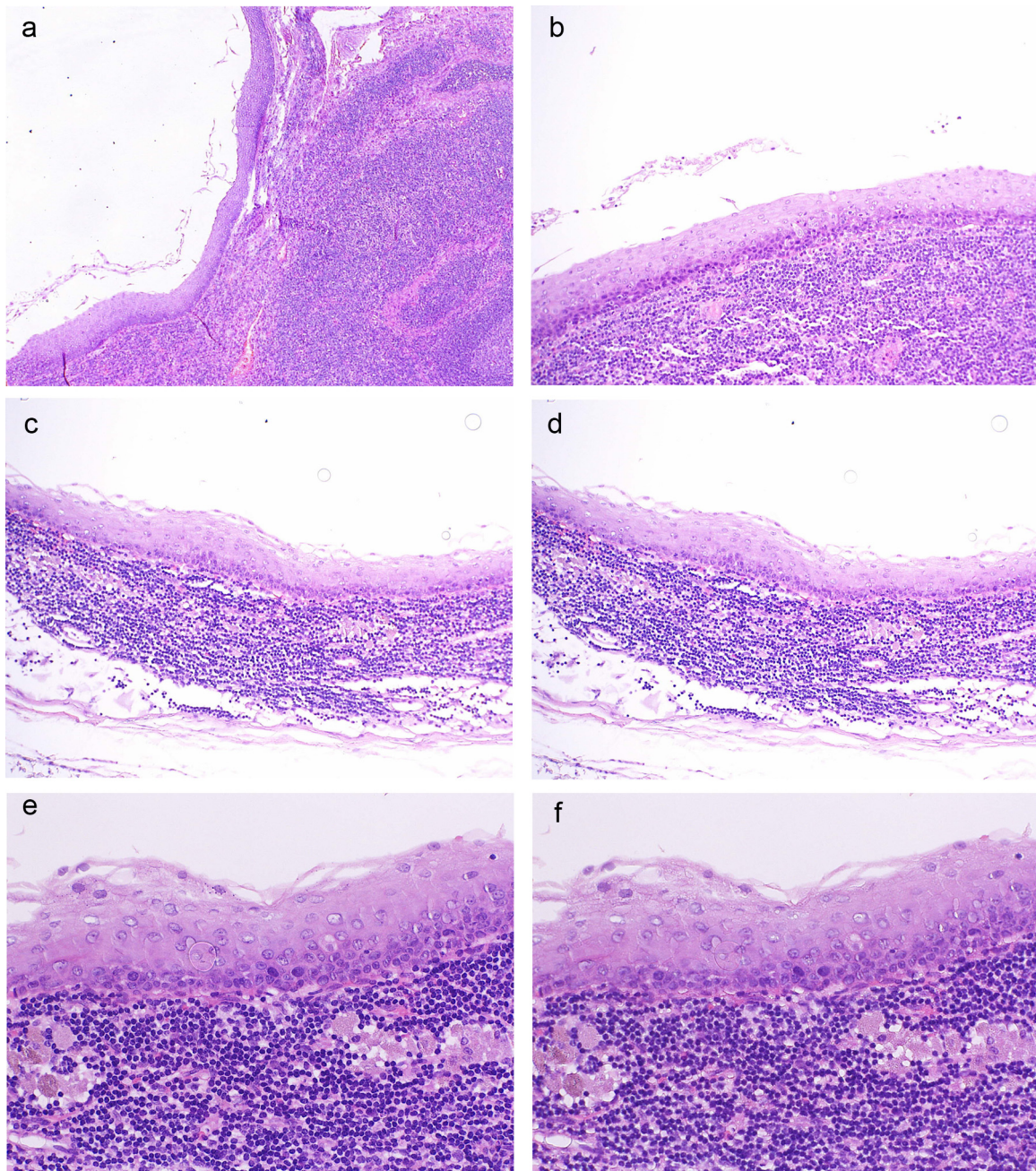


Fig. 5. (a–f) Histological view of the lesion, showing the wall of the branchial cyst with lymphoid stroma covered by squamous epithelium without atypia.

is typically seen in the lateral aspect of the neck. Any new lateral neck mass in an adult over 30 years old should be considered malignant until shown otherwise [4,5]; indeed, it is important to exclude metastatic lymphadenopathy, lymphoma, and tuberculosis [6]. Branchial cleft cysts occur mostly in late childhood or early adulthood, with no significant sex bias [7]. Second cleft anomalies represent about 95% of all branchial cleft anomalies [8,9].

The aetiology of branchial cleft cysts is not understood. Four main theories have been suggested: incomplete obliteration of the branchial mucosa, persistence of vestiges of the pre-cervical sinus, thymo-pharyngeal ductal origin, and cystic lymph node origin [10,11].

Clinically, the presentation is a painless, compressible swelling, situated at the anterior border of the sternocleidomastoid muscle, between the mandibular angle and the clavicle. The patient may report swelling of long duration with periods of waxing and waning.

An acute increase in size can occur during an upper respiratory tract infection; secondary infections and inflammation can also occur [12]. Although unusual, bilateral second branchial cysts have been reported and, in some patients, this is an aspect of branchio-otorenal syndrome [8].

Ultrasound, the first-line imaging method of choice, typically depicts a well-circumscribed cyst. However, there is variability in the ultrasound appearance of second branchial cleft cysts when secondary infection is present or when septa or cellular debris is present within the cyst, resulting in a pseudo-solid or heterogeneous appearance [13].

On computed tomography, these lesions typically appear well circumscribed and in the absence of complications they are uniformly hypodense with thin walls. Wall thickness may increase after infection. The cyst generally causes posterolateral displace-

ment of the sum and the vessel of the carotid space and anterior displacement of the submandibular gland [14].

MRI provides better depiction of the extent of a cyst in terms of its depth and a more precise preoperative assessment. The content of cysts varies from hypo- to isointense (relative to muscle) in T1-weighted sequences; it is hyperintense in T2-weighted sequences [15].

Cytology is also useful in reaching a preoperative diagnosis. Typical findings include a pus-like fluid, keratinised nucleolar cells, squamous epithelium, and a matrix of amorphous debris [16].

Histopathologically, the lining of a branchial cyst is generally stratified squamous epithelium, but is sometimes pseudostratified, columnar, and ciliated. The lining may also be ulcerated. The connective tissue wall contains abundant lymphoid tissue that shows germinal centres [17,18].

The differential diagnosis includes the possibility of metastatic squamous cell carcinoma, tuberculosis-related lymphadenitis, HIV-related lymphadenopathy, sarcoidosis, cat-scratch disease, lymphoma, and papillary thyroid carcinoma metastasis [7,18,19].

Open surgical treatment with a transverse cervical approach and resection of the lesion are recommended [20]. Some have described an endoscope-assisted approach [21].

This case report was written according to the Surgical Case Report guidelines [22].

4. Conclusion

In our case, the follow-up period has now reached 18 months, with no recurrence. Branchial cysts often grow over a long period, but in this patient this was not the case. Correct diagnosis and description of all new cases are essential; this was especially true for this patient's tumour, which was a very large one with unusually rapid growth.

This case is important in reminding us all not to underestimate the importance of any diagnosis.

Conflicts of interest

None.

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Ethical approval

None.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

All authors have contributed to the study concept, data collection, data analysis and interpretation, and writing the paper.

Guarantor

Gabriele Bocchialini.

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