Branchial Cyst: A Case Of Unusual Retrosternal Extension Into The Anterior Mediastinum
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Citation

Abstract
Branchial cleft cysts typically present as a unilateral, fluctuant soft tissue swelling that is localised deep to the anterior border of sternocleidomastoid in the lateral aspect of the neck. They are often discovered late in childhood or early adulthood. It is paramount that an accurate clinical diagnosis and in certain cases appropriate imaging is performed in order that definitive treatment may be carried out.

The authors present an unusual case of a 27yr old gentleman who presented with night sweats and weight loss associated with a lateral neck mass that extended retrosternally. Radiological appearances were consistent with a lymphoproliferative disorder.

INTRODUCTION
Branchial cysts (also known as lateral cervical cysts), predominantly present in the lateral aspect of the neck. Typically, a fluctuant swelling is felt deep to the sternocleidomastoid at the junction of its upper third and lower two thirds. They often present in the second and third decades of life. Diagnosis is usually made clinically. Fine needle aspiration can also facilitate diagnosis. Radiology may also be helpful if the cyst is large, in an unusual localisation or if the swelling pulsates. Excision is the treatment of choice to aid in diagnosis, for cosmetic reasons and to prevent possible infection of the cyst.

CASE REPORT
A previously fit and well 27 year old gentleman presented to his general practitioner with a two week history of a left sided neck swelling and associated symptoms of night sweats, weight loss (4kg) and fatigue. He had no dysphagia or respiratory compromise. Past medical history was unremarkable and he was on no regular medications. There was a family history of scleroderma. He was a non smoker. On examination, a large (8x5 cm) left supraclavicular swelling was noted. The mass was firm in consistency. A separate mass was felt to the left of the sternocleidomastoid. There was no evidence of a fistula. No other masses or lymph nodes were palpated in the axillae or groin. Respiratory and abdominal examinations were normal with no evidence of organomegaly. The full blood count results were within the normal limits. The chest x-ray revealed a smooth rounded mass 8cm in diameter lying in the left paratracheal region. A haematological referral was made, and a computerised tomography (CT) scan obtained. CT revealed a mass arising from the neck at the level of the thyroid gland extending inferiorly through the left supraclavicular fossa into the left anterior mediastinum (figure 1).

Figure 1
Figure 1: Coronal section of CT scan at level of thoracic inlet. CT demonstrates presence of mass extending from neck into chest, causing deviation of trachea.

The appearances were felt to represent a lymph node mass. Whole node biopsy was suggested to facilitate diagnosis. A lymph node biopsy was attempted but abandoned due to the presence of a large number of distended neck veins and distortion of the normal anatomy. He was subsequently
referred to a vascular surgeon. Re exploration of the left neck mass demonstrated a cystic structure lying deep to sternocleidomastoid. Aspiration and biopsy of the cyst was attempted. Histology revealed fibrocollagenous connective tissue only. Cyst fluid microscopy revealed negative staining for acid fast bacilli.

A repeat CT scan was obtained (figure 2) and was thought to show that the cyst in the left neck and upper left mediastinum was arising from the level of the thyroid gland and was displacing the left lobe of the thyroid anteriorly and medially.

**Figure 2**
Figure 2: Sagittal section of CT scan demonstrating close proximity of mass to subclavian vessels

The lesion appeared lobulated superiorly and lay deep to sternocleidomastoid. It extended inferiorly displacing the trachea to the right and extending into the anterior mediastinum to the level of the aortic arch. The patient was referred to the regional thoracic centre for further management. Exploration of the neck, partial mediastinotomy and complete excision of the cyst was carried out. Operative findings were of a large cyst which was adherent to jugular and carotid vessels with an obvious vascular pedicle feeding the cyst (figure 3).

**Figure 3**
Figure 3: Operative appearance.

The cyst extended down to the level of the aortic arch within the left anterior mediastinum. The cyst did not appear to have been recently infected. The patient made an uneventful post operative recovery. Histology of the specimen confirmed the presence of a cystic structure which contained some blood and was focally lined by fibrin. Well developed lymphoid tissue with reactive follicles is seen.

**Figure 4**
Figure 4: A partly collapsed cyst is supported by a fibrous wall containing well developed lymphoid tissue. H&E, X40.

**DISCUSSION**

Branchial cysts (BC) are thought, by some, to be an embryological remnant. Their exact tissue origin is unknown. Several aetiologies have been suggested including branchial cleft mucosa, the cervical sinus, the third pharyngeal pouch and lymph node epithelium.

Branchial cysts are usually confined to the neck and are one of the differential diagnoses of neck swelling. Usually,
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Diagnosis is made clinically from the location of the swelling and its consistency.

Occasionally diagnosis is difficult due to the firm nature of the mass. Constitutional symptoms are uncommon and usually represent infection within the cyst.

Since this cyst appeared to arise within the neck and to descend into the mediastinum it does not shed much light on the potential aetiology of these structures. It would be compatible either with branchial cleft remnant or a derivation from lymph node epithelium.

There are few reports of direct extension of branchial cysts into the mediastinum. This patient presented with symptoms, signs and investigations that were compatible with him having a lymphoma in his neck and mediastinum. However, surgical excision and subsequent histology revealed the mass to be a branchial cyst. This is the first report of such a case that we can determine.

The cyst has been mobilised superiorly from within the carotid sheath. Inferiorly it has been mobilised from behind the subclavian vessels and the left anterior mediastinum. An obvious vascular pedicle remained and this was clamped, divided and oversewn. (IJ Internal jugular vein)

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References

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