Case Report: Cervical Thymic Cyst

HS BALLAL, AJIT MAHALE, VINOD HEGDE, RAJESH SHETTY, MOHAN BHAVIKATTI, SURENDRA NAIK

Ind J Radiol Imag 1999; 9: 4: 187-189

Key Words: Thymus, Cyst, Neck, Cervical

Case Report:

A thirteen-year old boy presented to us with diffuse swelling and moderate pain in the right side of the neck. The swelling had been noticed two months prior to presentation and gradually increased in size becoming painful a week before the patient presented to us.

An ultrasound of the neck (SSH-140 A, Toshiba, Japan) was performed followed by CT scan (Somatom CR, Siemens, Erlangen). On sonography we noticed a hypoechoic linear area extending from the neck into the superior mediastinum. It was present between the internal jugular vein and the carotid vessels in the neck and was posteromedial to the sternocleidomastoid muscle in the neck, extending inferiorly into the superior mediastinum on the right side. The thyroid gland was medial to the cystic lesion
(Figs.1-2).

Axial CT scans showed a hypodense area with fluid density (5-20 HU) extending from the carotid triangle into the right upper thoracic paratracheal region. It was bounded laterally by the internal Jugular vein, anterolaterally by the sternocleidomastoid muscle, medially by the common carotid artery and right lobe of the thyroid gland and posteriorly by the vertebral artery, and the longus colli and scalenus muscles. Inferiorly, in the superior mediastinum it was in the right paratracheal region (Figs. 3,4). Our provisional diagnosis was a branchial cleft cyst with a differential diagnosis of cervical thymic cyst.

Fig.1: Transverse ultrasound scan of the right side of neck shows a cystic lesion with internal echoes lying between the common carotid artery (CCA) and internal jugular vein

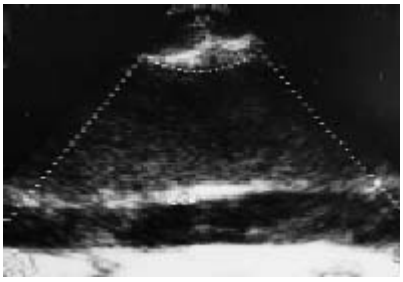

Fig. 2: Longitudinal ultrasound scan of right side of the neck shows a linear cystic lesion with internal echoes lying anterior to the common carotid artery (CCA).

Cystic hygromas are cystic masses with linear septae [3]. They present shortly after birth, occur in the posterior triangle and may extend into the anterior triangle. The CT appearance differs from a branchial cleft cyst but the differentiation can be difficult. Cystic hygromas are poorly circumscribed and multiloculated compared to branchial cleft cysts [1].

The most common congenital lesion seen on CT is a branchial cleft cyst [1]. Of these, 95% arise from the remnant of second branchial apparatus. Second branchial cleft cysts are painless neck masses, located below the angle of the mandible, along the anterior border of the sternocleidomastoid muscle. They are cystic on ultrasound and do not usually contain internal septae. On CT scan, these present as low density, well-circumscribed masses with rim enhancement. They can occur at any age [1].

During the sixth fetal week the third pharyngeal pouch on each side expands into a solid dorsal and a hollow ventral portion. The ventral wings soon elongate medially and caudally to become tubular omopharyngeal ducts. During the seventh week of development the connections between the duct and the pharynx are severed. At the same time epithelial proliferation results in obliteration of ductal lumina and formation of solid cords, which soon give rise to side branches. Each side branch later becomes the core of the thymic lobule [4].

By the eighth fetal week, the two thymic primordia meet in the midline, join the parietal pericardium and continue to descend into the mediastinum upto the ninth week. The inferior parathyroids, which develop from the dorsal wings of the third pouches separate from the caudal tip and remain at the inferior thyroid poles. The fourth pharyngeal pouches that give rise to the superior parathyroid glands and the parafollicular cells of the thyroid gland may also contribute to the thymic tissue, in a small way [4].

During the third fetal month, cellular differentiation and continuing proliferation in the thymus separate the cortex from the medulla and give the gland a lobular shape. Histopathologically, the diagnosis was a cervical thymic cyst.

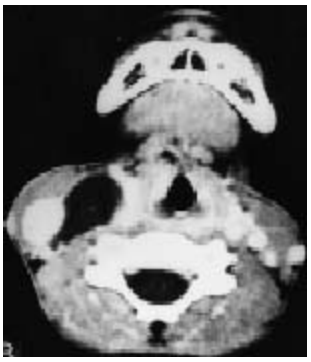

Fig. 3: Axial contrast-enhanced CT of the neck shows the cyst appearing as a hypodense, non-enhancing lesion, bounded laterally by the internal jugular vein and the sternocleidomastoid muscle and medially by the carotid artery and the longus colli muscle.

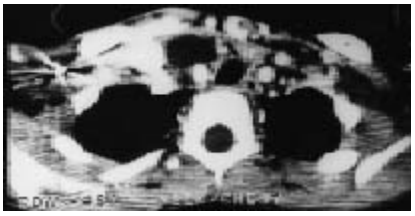

Fig. 4: Axial contrast-enhanced CT shows the cyst extending into the superior mediastinum in the right paratracheal region anterior to the innominate artery.

Discussion:

The usual etiologies of neck masses in children are cystic hygroma, branchial cleft cyst if located laterally and thyroglossal cyst, if in the midline.[1]

The most common midline lesion of the neck in a child is from thyroglossal remnants. These can be found at any level, from the base of the tongue to the thyroid isthmus and can present as thyroglossal cysts or sinuses, the latter confirming the diagnosis if demonstrable [2].

Nests of thymic tissue may be found anywhere along the descent of the thymic primordia from the angle of the mandible to the mediastinum. Mediastinal extension is seen 50% of cervical thymic cysts [4].

Speer originally described five causes of these cysts :
1) Remnants of embryological thymopharyngeal ducts,
2) Sequestration products of thymic involution,
3) Degeneration of Hassal's corpuscles (epithelial cells aggregated into concentric onionskin layers of keratinized cells),
4) Connective tissue, lymph nodes and blood vessels arrested in various stages of thymic development,
5) Neoplastic changes in lymphoreticular or connective tissues [5].

Ultrasound and CT scan are both good modalities to assess cervical thymic cysts. They help in surgical planning and assessing the extent of the lesion [5]. On ultrasound, they appear as hypoechoic masses with few septae and internal echoes. CT scan with contrast shows better margination and their relationship to the adjacent vessels. They are hypodense and well defined with minimal enhancement of the margins on contrast scans. MR can also be used for superior soft tissue evaluation. The lesions are hypointense on T1W images and hyperintense on T2W images. These lesions usually lie medial to the sternocleidomastoid muscle, anterior to the carotid sheath and lateral to the thyroid gland.

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