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Cervical thymic cyst
Case report

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CERVICAL thymic cyst is a rare lesion. It is not usually found at birth, but appears later in life, most frequently before the age of twenty-one years; both sexes are equally affected. Most cervical thymic cysts appear suddenly and are associated with few symptoms. A thymic cyst is most commonly located behind the lateral lobe of the thyroid gland, at the level of the middle third of the anterior border of the sternomastoid muscle. However, it may also be found anywhere from the piriform fossa to the anterior mediastinum. Thymic cysts have a long history of recognition. At one time they were thought to be due to T.B. and later to syphilis. Westenryk, in 1900, proposed a congenital cause.

The first attempt to excise a cervical thymic cyst was on an eighteen-month-old infant in 1901 by Pollosson and Piéry, but unfortunately the child died. It was not until 1944 that Hyde *et al.* reported the first successful excision. To date only thirty-four cases have been documented (Table I). Ectopic thymus in the neck and thymic cysts which had originated in the mediastinum and subsequently appeared as cervical cysts have been excluded from this survey.

Embryogenesis

The thymic primordia in man appear late in the sixth week of gestation, as a ventral outgrowth of the third pharyngeal pouch. By the early part of the seventh week the primordia have elongated considerably but are still connected with the pharyngeal pouches, and remain associated with the pair of parathyroid glands derived from the third pouches.

During the seventh week they increase rapidly in size and their distal tips begin to approach each other as they swing towards the mid-line just caudal to the thyroid primordium. By the middle of the eighth week, the distal tips of the thymic primordia have made contact with each other and have started to descend under the sternum into the anterior mediastinum, where they lie in contact with the parietal pericardium and great blood vessels of the superior mediastinum. At any point along the path of descent, the entire gland or portions thereof may be left behind.

Report of a case

A nine-year-old boy was admitted to Ipswich Hospital. A non-tender, painless swelling had appeared on the left side of his neck six months prior to admission.

On examination this clinically euthyroid child had a smooth, elongated, cystic mass behind the lower half of the left sternomastoid muscle, extending beyond the anterior border of the muscle (Fig. 1). It did not ascend on swallowing nor on protrusion of the tongue. A preliminary diagnosis was made of a branchial cyst.

Full blood count showed no abnormality, and plain X-ray of the neck showed a little soft-tissue swelling immediately posterior to the proximal trachea.

At surgery, a transparent cystic swelling was found in the region of the lower

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TABLE I

CASES OF CERVICAL THYMIC CYST DOCUMENTED IN THE LITERATURE

Author	Year	Cases	Age yr	Sex	Duration	Treatment	Size	Contents	Lining
Pollosson and Piéry	1901	1	1½	M	Birth	Excision necropsy	Fist size	Brown fluid	Flat pavement cells
Hyde *et al*	1944	1	5	M	8 mo	Excision	36 gm 7×5.5×3.2 cm	Yellow-brown liquid with cholesterol crystals	Pavement cells
King	1949	8	?	?	?	?	4 unilocular 4 multilocular	Clear fluid with cholesterol crystals to pultaceous material	Spindle cells, squamous to stratified squamous. rarely columnar
Heinz	1950	1	6	M	?	Excision	?	?	Squamous epithelium
Weller *et al*	1951	1	4½	F	4 mo	Excision	4×7·5×4·5 cm	Cloudy, pale brown fluid	Flattened cells and stratified squamous cells
Crawford *et al*	1957	1	6	M	3 yr duration with sudden enlargement 6 weeks before operation	Excision	4×5 cm multiocular	Brown red fluid	Stratified squamous and. in areas, necrotic with cholesterol clefts
Williams and Gerber	1957	1	6	M	3 weeks	Excision	12×5×5 cm Unilocular	Yellow turbid fluid with fine yellow crystals	Pavement epithelium and fibrous tissue
Viar *et al*	1959	1	5	M	4 yr of asymptomatic mass with sudden growth in the past 2 to 3 mo	Excision	15×6 cm	?	Squamous epithelium

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Author	Year	Cases	Age yr	Sex	Duration	Treatment	Size	Contents	Lining
Lane	1960	1	27	F	3 weeks	Excision	2.5 cm	Clear glairy fluid	Squamous epithelium
Côté and Fortin	1961	1	6	F	6 days	Excision	?	?	Squamous epithelium
Movitz and Lum	1961	1	32	F	3 weeks	Excision	4×5 cm Unilocular	Clear amber fluid	Fibrous lining
Gaeckle and Gerber	1962	1	21	M	3 weeks	Excision	3×4 cm Unilocular	Thin, watery aluminium-coloured fluid	Cuboidal
Ozlu and Allen	1962	1	14	F	3 weeks	Excision	4×5×6 cm	Clear fluid	Squamous epithelium
Lewis	1962	1	13	M	5 weeks	Excision	2×3×4 cm Multilocular	Clear, pale yellow gelatinous	?
Fielding *et al.*	1963	4	7	M	4 yr	Excision	7×4×3.5 cm with cysts up to 2 cm	Cloudy	Squamous epithelium
			7	M	3 mo	Excision	17×4×2 cm mass with multiple cysts	Green-brown fluid	Flattened epithelium
			13	M	4 mo	Excision	11×4×2.5 cm mass with multiple cysts	Watery fluid	Squamous, transitional and fibrous
			8	M	3 days	Excision	15×5×2 cm mass with many cysts	Brownish fluid	Fibrous and flat epithelium
Simons *et al.*	1964	1	5	M	2 weeks	Excision	2.5×4.5 cm	Thick, reddish brown fluid	Cuboidal lining

Author	Year	Cases	Age yr	Sex	Duration	Treatment	Size	Contents	Lining
Bieger and McAdams	1966	5	8	M	8 days	Excision	2.4 cm	Purulent	Columnar, pseudo-stratified and no epithelium
			8	F	6 mo	Excision	3×2.5 cm mass with multiple cysts	Gelatinous	Simple squamous, columnar, stratified squamous pseudostratified columnar, and no lining
			8	F	?	Excision	5×3×2.5 cm mass with multiple cysts	?	No lining, simple squamous, columnar. pseudostratified columnar transitional
			12	M	?	Excision	4.5×1.7×1.5 cm mass with multiple cysts	Opalescent and cloudy	Simple squamous, columnar, pseudostratified. columnar
			74	M	?	Autopsy	1 cm multiple cyst	?	Simple squamous, columnar, pseudostratified
Indeglia *et al*	1967	2	15	M	Incidental finding & surgery for thyroid carcinoma	Excision	Small	Clear	Flat epithelium
			68	F	Incidental finding & surgery for thyrotoxicosis	Excision	Small	Amber	Epithelium lining of polygonal cells
Mikal	1974	1	21	F	3 weeks	Excision	4×3×3 cm	Clear, light straw coloured	Fibrous, cuboidal and pavement cells
Al-Shihabi & Jackson	1981	1	9	M	6 mo	Excision	14×4×2 cm mass with multiple cysts	Brown fluid and cholesterol	Stratified squamous epithelium

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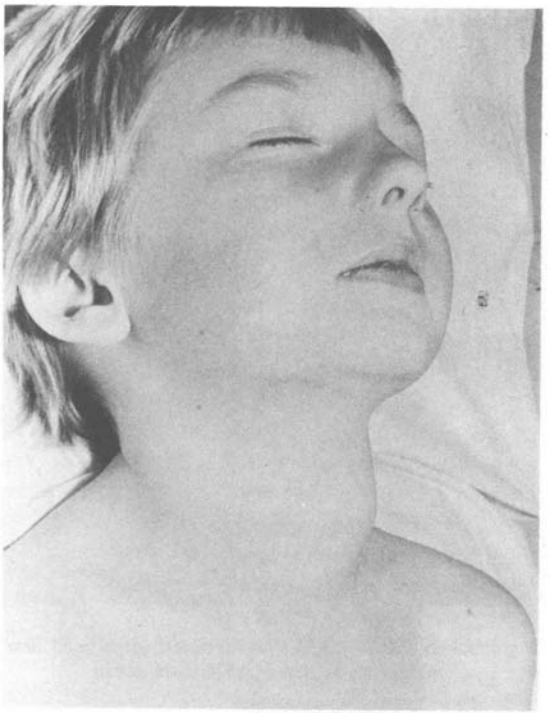


FIG. 1
A pre-operative right oblique view.

half of the left sternomastoid, extending blindly upwards to the hypopharynx, and downwards and medially as a thick solid cord towards the mid-line, behind the left clavicle. The cyst and its associated tract were excised (Fig. 2).

Pathological examination indicated that the cyst was 14 × 4 × 2 cm. Solid tissue was present in the wall at one end of the cyst, which was lined with stratified squamous epithelium. The cyst wall consisted of fibrous tissue containing collections of lymphoid cells, some of the larger collections of which enclosed Hassall's corpuscles (Fig. 3). A foreign body granulomatous reaction to cholesterol was present in parts of the cyst wall. The solid tissue was shown to be thymic tissue (Fig. 4).

The features were those of a cervical thymic cyst, and there was no evidence of malignancy. No organisms were seen in the film from the fluid, and no growth was obtained after forty-eight hours or six weeks.

The patient made an uneventul post-operative recovery and has remained in good health.

Pathology

A cervical thymic cyst may be unilocular or multilocular, varying in size from 1 cm to 15 × 6 cm in diameter. Its content ranges from clear or straw-coloured fluid to semi-solid material. Luminal fluid frequently contains cholesterol crystals

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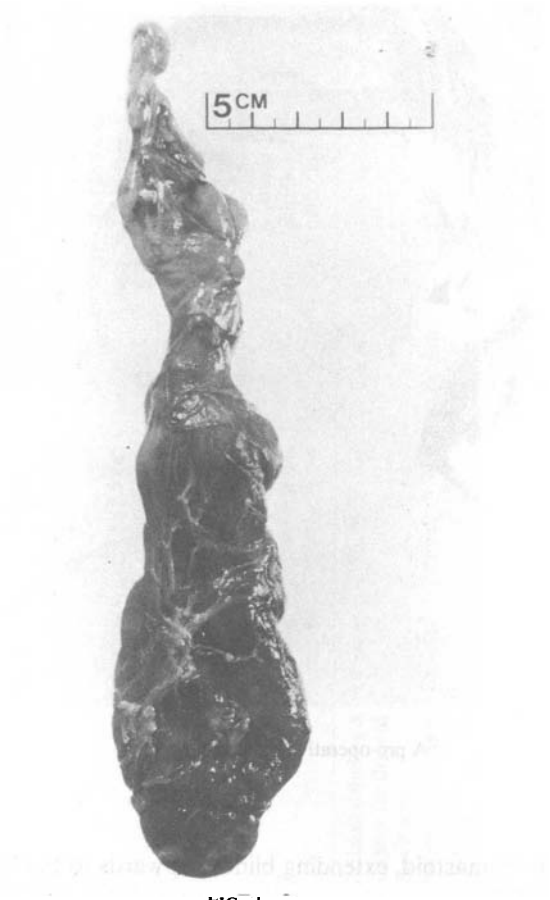


FIG. 2
Macroscopic view of the cervical thymic cyst 14 × 4 ×2 cms.

which may be embedded in the cyst wall, forming cholesterol clefts and cholesterol granulomas.

The cyst may be lined by spindle, cubical or columnar cells, ciliated or non-ciliated, stratified or pseudostratified. Occasionally, fibrous tissue may line the cyst due to destruction of the epithelial lining by infection or pressure necrosis.

Characteristically, Hassall's corpuscles are found to lie within or adjacent to the wall of the cyst, and lymph follicles may frequently be present in the wall.

Malignant degeneration of a cervical thymic cyst has not been reported although a malignant neoplasm in a heterotopic non-cystic thymus gland has been documented.

Comment

The vast majority of cervical thymic cysts have presented in patients of less than twenty-one years old. They are classified as congenital or acquired. The congenital cyst arises from the thyropharyngeal duct, which is a derivative of the

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FIG. 3
Part of the cyst wall lined with flattened epithelium (E) and containing underlying thymic tissue. Hassall's corpuscles. HE × 176.

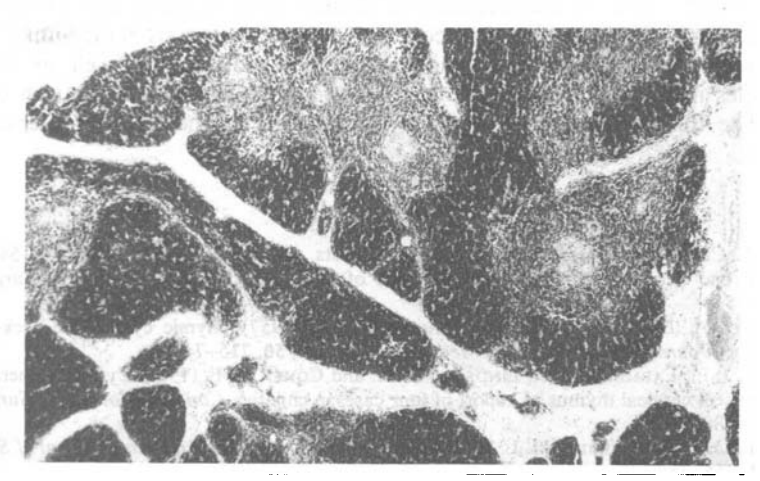


FIG. 4
Solid tissue in the cyst wall having the microscopic features of thymic tissue with fibrous septa (FS), cortex (C), Medulla (M) and Hassall's corpuscles (HC). Haemotoxylin and eosin (HE) × 69·3.

third pharyngeal pouch. The acquired cyst may be either inflammatory or a neoplastic, with cystic degeneration of Hassall's corpuscles, primitive endodermal cells, or lymphocyte reticular cells. A thymic fistula, although never reported, may occur and connect the piriform fossa to the cervical skin.

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Symptoms have often been present for a few months prior to consideration for surgery. Ninety per cent of patients complained of painless swellings, three per cent noted a post-traumatic mass, and six per cent presented with dyspnoea, hoarseness or dysphagia.

All cervical thymic cysts are said to be mobile at the time of physical examination. Concomitant disease, such as intra-nodal Hodgkin's disease, has been reported.

The pre-operative differential diagnosis includes lymph node, branchial cyst, cystic hygroma and thyroglossal cyst. From the literature it seems that a firm diagnosis of cervical thymic cyst has not been made pre-operatively.

Analysis of forty-seven cases of cervical cysts, of which twenty-five were branchial, twelve thyroglossal, eight thyroid, one thymic and one parathyroid, revealed that cholesterol crystals are often present in the intra-luminal fluid, and cholesterol clefts or granulomas and lymphoid tissue are frequently incorporated in the wall of these cysts.

Consequently, cholesterol crystals suspended in the intra-luminal fluid and cholesterol clefts, granulomas and lymphoid aggregates in the wall of a cervical cyst are characteristic findings of all the types of branchiogenic cysts mentioned above.

One possible exception was a parathyroid cyst which had clear fluid and in which the wall was free of cholesterol deposit.

Summary

Thymic derivatives should be included in the differential diagnosis of cystic masses in the neck. A classification of thymic cysts is proposed: namely, true mixed or false. A thymic cyst may contain cholesterol crystals in the luminal fluid, cholesterol clefts, granulomas and lymphocytic follicles as well as Hassall corpuscles in the wall. Treatment consists of simple excision of the cyst and its tract. The thirty-fifth case of cervical thymic cyst in the English Literature is reported.

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