

Ossified thyroglossal cyst – is it of embryological significance?

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Abstract

We report a case of a partly ossified thyroglossal cyst in close proximity to the hyoid bone and discuss the possible embryological significance of this. Thyroglossal cysts occurring within the hyoid bone or deep to the hyoid periosteum support previous suggestions that the thyroglossal tract can sometimes be trapped within the developing hyoid bone.

Key words: Thyroglossal cyst; Ossification, heterotopic; Hyoid bone

Case report

An 87-year-old man presented with a one-month history of a mass in the midline of the neck at the level of the hyoid bone. He had no other symptoms and there was no relevant past medical history. His corrected blood calcium was 2.46 mmol/l (reference range: 2.20–2.65 mmol/l). On examination a smooth, bony, hard, mass approximately 5 cm in diameter was palpable in the hyoid region. A CT scan was performed (Figure 1) which showed a cystic lesion attached to, or arising from, the hyoid bone. The wall had the radiological features of calcification whilst the contents of the cyst were homogenous and of fluid density.

The lesion was removed surgically. At operation a bony mass was found attached to the hyoid bone. There appeared to be a short tract with cystic areas below the mass in the midline. The midportion of the hyoid bone, the attached mass and the associated tract were removed. The patient made an uneventful recovery and has remained well one year later.

Pathological examination confirmed that the lesion was a cyst. It was lined by a thin layer of parakeratotic squamous epithelium supported by a layer of fibrous granulation tissue. Surrounding this the wall of the cyst was ossified and consisted of vascular lamellar bone only. There was considerable perivascular osteoblastic activity and scattered osteoclasts were present attached to the inner surface of the bone (Figure 2). In some parts of the cyst the surface epithelium was missing and was replaced by a dense layer of inflammatory granulation tissue. This is a frequent result of degenerative or inflammatory changes in a thyroglossal cyst (Figure 3).

Discussion

Thyroglossal cysts are the most common nonodontogenic cysts in the neck and are thought to arise from the remnants of the thyroglossal tract. Most arise in childhood but around one-third of all cases are diagnosed in adults over the age of 30 years (Allard, 1982). Surgical excision following the principles suggested by Sistrunk (1920) is the usual method of treatment.

During embryological development the thyroid gland descends from the foramen caecum area of the tongue, passing in

front of the second branchial arch, to its adult position in the lower part of the neck. As the hyoid bone develops from the second branchial arch the tract left by the descending thyroid thus passes in front of the hyoid (Brintall *et al.*, 1954). Later rotation of the hyoid bone to its adult position carries the tract posteriorly and cranially at the inferior border of the bone so that



FIG. 1

CT scan showing a cystic mass with a calcified wall arising from the isthmus of the hyoid bone.



FIG. 2

Part of cyst wall lined by parakeratotic squamous epithelium supported by fibrous granulation tissue lying on vascular lamellar bone. (H&E; $\times 150$).

the tract curves upwards behind the bone before resuming its downward course in the midline of the neck (McClintock, 1936). It has been suggested on the basis of histological and other evidence that the two halves of the hyoid may trap the thyroglossal tract as they unite and so the tract may pass deep to the periosteum of the hyoid bone or even through the bony substance of the hyoid itself (Gross and Connerly, 1940; Dalgaard and Wetteland, 1956; Soucy and Penning, 1984). However Ellis and Van Nostrand (1977) carried out an extensive study of the relationship between the hyoid bone and the thyroglossal tract. They concluded that the apparent trapping of the tract within the hyoid reported by other authors was section artefact.

Histologically thyroglossal cysts have a varied appearance. The epithelial lining may be squamous, pseudostratified columnar or may be replaced by fibrous connective tissue in the presence of infection. Intestinal-type epithelium has also been reported (Ishwariah and Froome, 1962). Thyroid tissue may be present in the wall of the cyst. Allard (1982) found that in a reported series the incidence of this varied from only 1.5 to 62 per cent. The cyst reported here is, apart from the ossification within the wall, consistent with a thyroglossal cyst. Osteoblastic activity is not a usual feature of heterotopic calcification (Walter and Israel, 1987) and may indicate cystic expansion of the hyoid bone or periosteum. This is consistent with the anatomical relationship of the cyst with the rest of the hyoid bone.

We have identified two previous reports of cases with similarities to that reported here. Monzen *et al.* (1991) reported a case of a thyroglossal cyst with a partly calcified wall in a 52-year-old man. The cyst was to the left of the midline and was adherent to, but not within, the hyoid bone. This would appear to be a case of heterotopic calcification in a thyroglossal cyst. The other case, reported by Podoshin *et al.* (1989), is similar to the one reported here. A 63-year-old woman had a three-month history of a swelling in the neck and a CT scan showed a cystic lesion in the isthmus of the hyoid bone. The lesion was surgically removed and histologically it had a variable epithelial lining with a calcified



FIG. 3

Another area of the cyst wall where the surface epithelium has been replaced by dense inflammatory granulation tissue. (H&E; $\times 150$).

wall composed of a mixture of woven and lamellar bone with osteoblastic activity. They concluded that the lesion was a thyroglossal cyst arising within the substance of the hyoid bone but did not discuss the embryological significance of this.

The lesion presented here may also represent a thyroglossal cyst arising within the substance of the hyoid bone or at least deep to the periosteal layer. This, coupled with the report by Podoshin *et al.* (1989) supports the suggestion that the thyroglossal tract can become trapped within the developing hyoid bone and offers a contrary view to the evidence of Ellis and Van Nostrand (1977) suggesting that this does not occur.

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