

## Radiology in Focus

# Callus originating in the laryngeal skeleton, presenting as a neck lump: a case report

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### Abstract

We report on the case of a young woman, presenting with a left lateral neck lump, which turned out to be a bony callus originating from the thyroid cartilage; similar but smaller lesions were found on the same side in the hyoid and cricoid cartilages. The CT, MRI and pathological findings are described.

**Key words:** Laryngeal neoplasms; Thyroid cartilage; Callus

### Case report

A 27-year-old woman presented with a left-side neck lump, accidentally discovered by her beauty specialist. The patient had no other significant medical history. Physical examination revealed a hard swelling of the left thyroid cartilage. There was no pain, tenderness or evidence of infection. Indirect laryngoscopy showed no abnormalities.

MRI revealed a mass lesion, centred on the left lamina of the thyroid cartilage; it extended into the paralaryngeal space, reaching the true vocal fold. The infrahyoid strap musculature was displaced anterolaterally, corresponding to the palpated lump. The mass showed a maximal diameter of about 3 cm. On T<sub>2</sub>-weighted images, the mass appeared hyper-intense with intermingling bands of lower intensity. The mass was roughly iso-intense with the surrounding musculature on T<sub>1</sub>-weighted images, although some lower intensity bands could be seen. After administration of gadolinium-DTPA, a rather strong but inhomogeneous enhancement was noted (Figure 1).

A similar but smaller lesion in the left side of the hyoid bone was found. The thyroid cartilage mass reached the crico-thyroid articulation; the adjacent part of the cricoid showed changes with similar intensity characteristics.

A subsequently performed CT of the larynx showed an asymmetrical ossification of the thyroid cartilage, particularly dense on the left side (Figure 2a). An irregularly-shaped structure, for the greater part delineated by what appeared to be a cortical layer and containing trabecular calcifications, covered the outside of the left thyroid cartilage lamina. There was also an irregular and dense calcification of the cricoid near the crico-thyroid articulation (Figure 2b). Similar dense and irregular calcification was seen around the junction of the body and left greater horn of the hyoid bone. During intravenous administration of a contrast agent, a rim of intense enhancement was seen around the areas of abnormal laryngeal cartilage (Figure 2c). Despite the atypical radiological findings, the possibility of some kind of tumour arising from the laryngeal cartilages could not be ruled out with certainty. An incisional biopsy of the thyroid and cricoid mass was performed through a collar incision.

Pathological examination showed callus formation with irregular islands of cartilage and immature bone embedded in a highly vascular and cellular tissue. The bony trabeculae were surrounded by numerous osteoblasts (Figure 3).

On re-anamnesis, the patient did not recall any laryngeal trauma.

### Discussion

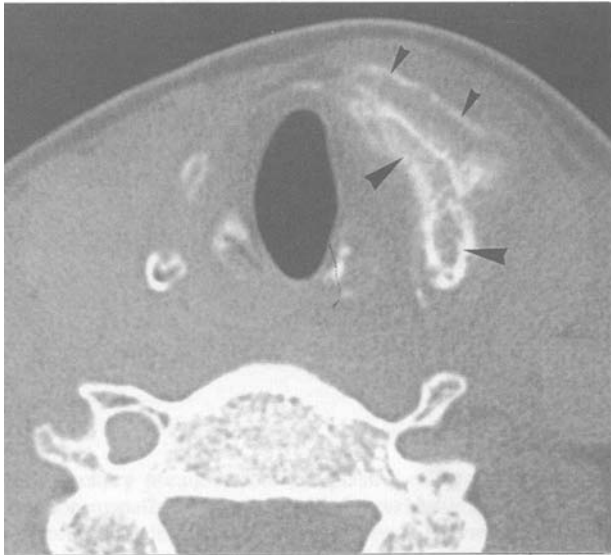
Ossification of the laryngeal cartilages is a slowly progressive



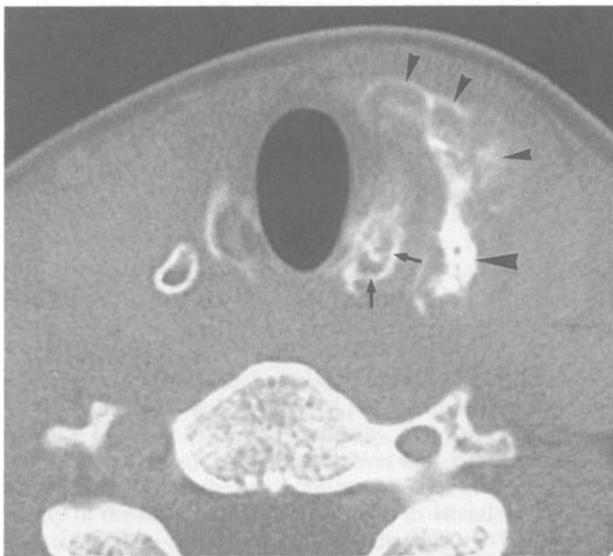
FIG. 1.

Coronal enhanced T<sub>1</sub>-weighted spin-echo image through the larynx. Inhomogeneous enhancing mass lesion (black arrowheads) centred on the thyroid cartilage. The mass extends into the paralaryngeal space, abutting the true vocal fold (white arrowheads), and displaces the strap musculature slightly outwards (arrows).

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(a)



(b)



(c)

FIG. 2.

Axial enhanced CT images, bone window (a and b), soft tissue window (c). (a) Dense ossification of the left thyroid lamina (large arrowheads), covered by an irregular, incomplete calcified structure (small arrowheads); (b) the left side of the cricoid shows near the crico-thyroid junction a similar irregular dense area (arrows); (c) a rim of intense enhancement is present around these abnormal cartilage areas (white arrowheads).

process; in women, this ossification appears around the age of 25 years, about five years later than in men, and is hardly ever complete (Bourjat, 1973). Normally, the ossification centres evolve in a symmetrical fashion.

Tumours of the laryngeal cartilage are rare. No tumours other than chondroma or chondrosarcoma have been reported (Batsakis, 1975; Neis *et al.*, 1989). These lesions usually show calcifications on CT (Van Holsbeeck *et al.*, 1985; Muñoz *et al.*, 1990); the presence of bone trabeculae on radiographical examination was not reported, although ossification does occur in these tumours (Neis *et al.*, 1989; Lloyd *et al.*, 1992).

Possibly, the laryngeal masses in this patient, aligned on one vertical line, are due to a forgotten or denied laryngeal trauma. After blunt trauma, the laryngeal skeleton heals by granulation tissue evolving to scar tissue. Minimally displaced fractures heal without deformity. In more severe cases, further distortion of the laryngeal skeleton due to retraction is possible (Mancuso and Hanafee, 1985). Considerable distortion of the larynx is sometimes found in patients not recalling a laryngeal injury, showing the same deformities as those seen following severe blunt trauma (Hanson *et al.*, 1982; Chui *et al.*, 1990).

Callus formation after laryngeal trauma has not been reported to our knowledge. Why the laryngeal skeleton in this patient reacted with callus formation is not clear.

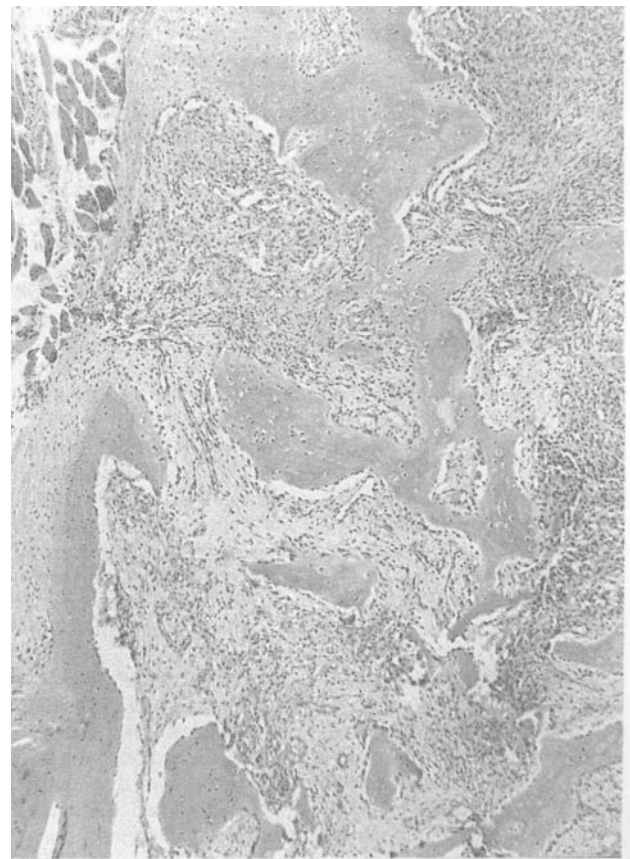


FIG. 3.

Irregular islands of immature bone are surrounded by a vascular and cellular stroma. Periosteum and adjacent skeletal muscle at left upper edge. (H & E;  $\times 50$ ).

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