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## A developmental variant of the thyroid cartilage

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### Abstract

Neck sonography is commonly used as the first imaging method for acute and chronic neck pain or swelling. Adequate knowledge of normal sonography findings is needed for optimal patient work-up. Although thyroid cartilage is rarely sonographically analyzed, there are anatomical variants detectable with sonography. These variants should not be confused with pathologies. Our case report is focused on cyst-like lesions of the thyroid cartilage, which are uncommon incidental findings when imaging is performed. The aim of this case report is to illustrate the ultrasound and magnetic resonance imaging appearances of these cyst-like formations. These formations are benign, have no clinical significance and do not require any additional assessment.

## Case report

A 32 year-old woman was referred for a neck sonography (US) due to a history of pain in the right submandibular area. Her past medical history was negative.

On ultrasound, the thyroid gland, the parotid and submandibular glands were normal. We noted three homogeneously hypoechoic well-defined avascular foci of up to 4 mm: two right-sided and one left-sided in the thyroid cartilage (Fig. 1).

Due to persistent pain, magnetic resonance imaging (MRI) of the neck was performed to assess these lesions and to exclude any lesions missed with US. On MRI, small well-defined structures with intermediate T1-weighted signal and high signal on the fat-suppressed sequence were seen on each side of the thyroid cartilage (Fig. 2).

No contrast enhancement was seen. MRI did not demonstrate any other pathology.

The final cause of the neck pain was not explained with MRI, but the clinical outcome of the patient was finally considered as normal.

## Comments

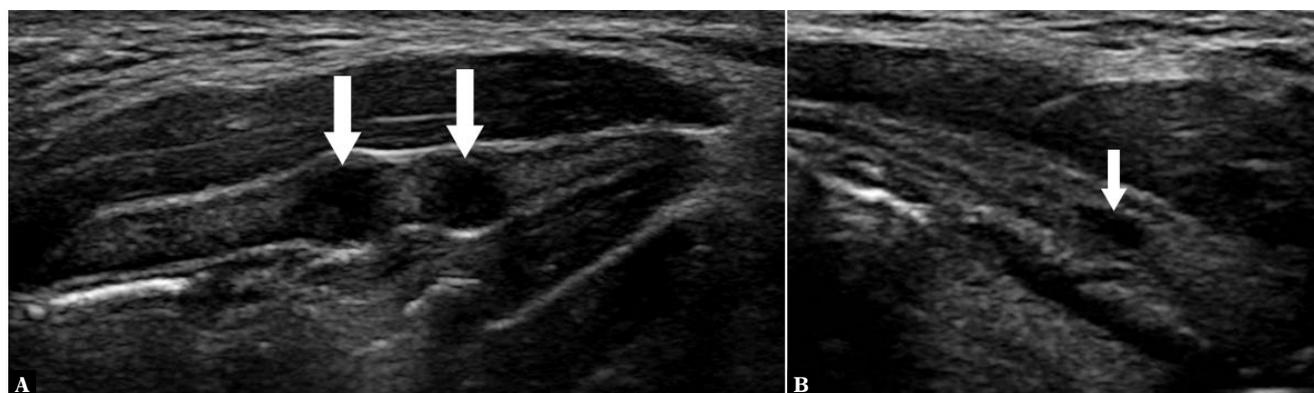
The thyroid cartilage, the largest of the nine cartilages of the larynx, consists of two laminae of hyaline cartilage that fuse into the midline, forming the prominent V angle called laryngeal prominence or Adam's apple<sup>(1)</sup>.

The ossification process begins in the inferior portion of the posterior third of the lamina and inferior horn<sup>(2)</sup>. The anterior half of the cartilage usually ossifies at the late stage with a tendency to partial calcification at this level in the female population<sup>(1,2)</sup>. The unossified areas within the thyroid laminae often persist as radiolucent "windows" till an advanced age<sup>(1,2)</sup>.

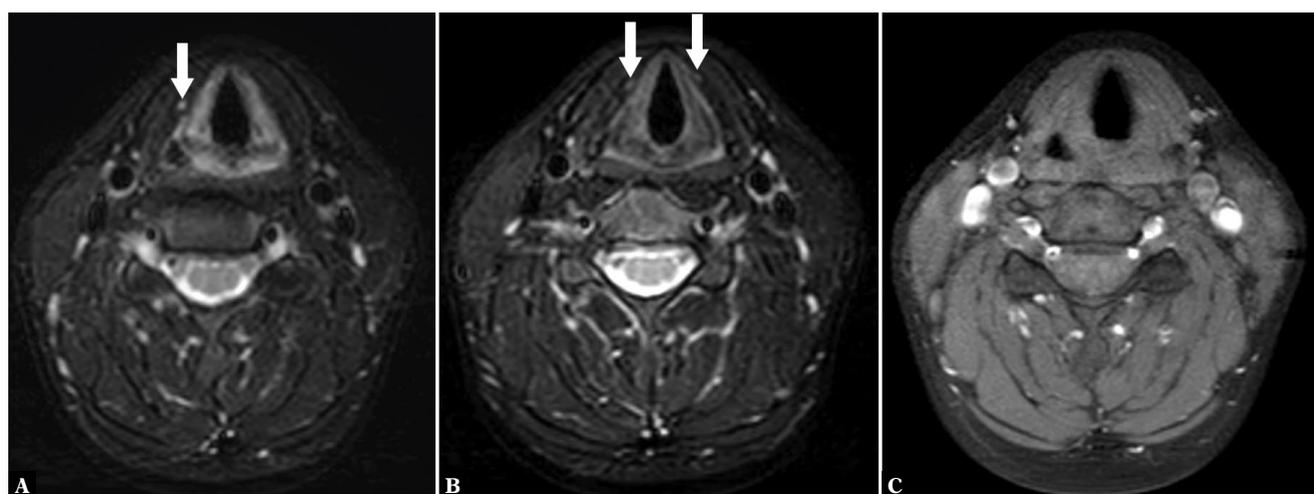
The cyst-like formations of the thyroid cartilage are uncommon and are incidental findings on imaging, mainly seen in the adolescent age group<sup>(2)</sup>.

They are considered developmental variants and their appearances are correlated with the degree of mineralization and calcification occurring during adolescence<sup>(2)</sup>.

The differential diagnosis of thyroid cartilage lesions includes chondrosarcomas and chondromas. In these



**Fig. 1.** Sagittal ultrasound images of the neck demonstrating hypoechoic well-defined structures in the lamina of the thyroid cartilage (arrows) (A) on the right side of the neck (two structures) and (B) on the left side of the neck (one structure – arrow)



**Fig. 2.** Axial MRI images of the neck demonstrating two lesions in the right lamina of the thyroid cartilage and one lesion on the left side, presenting high signal on T2-weighted images with fat suppression (arrows) (A, B), and no contrast enhancement on T1-weighted postcontrast image with fat suppression (C)

cases, abnormalities are visible on fiberoptic laryngoscopy, CT and MRI. Rare cases of degenerative cysts of the thyroid cartilage were reported in patients with a history of neck trauma<sup>(3)</sup>. Furthermore, some cases of early physiologic ossification of the thyroid lamina in children were reported and can mimic metastatic calcification<sup>(4)</sup>. In our case, the cyst-like formations were millimetric and symmetric without signs of malignancy. These are considered benign changes of thyroid cartilage with no clinical significance and do not require any additional assessment or follow-up<sup>(2)</sup>.

The aim of our case is to raise the awareness of this uncommon benign variant that may be encountered during a routine neck US. The awareness of this variant will clinch the diagnosis without further investigations.

#### Conflict of interest

*Authors do not report any financial or personal connections with other persons or organizations, which might negatively affect the contents of this publication and/or claim authorship rights to this publication.*

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