

# TRITICEAL CARTILAGE: MORPHOLOGY AND CLINICAL-SURGICAL IMPLICATIONS

## CARTILAGEM TRITÍCEA: MORFOLOGIA E IMPLICAÇÕES CLÍNICO-CIRÚRGICAS

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### ABSTRACT

The triticeal cartilage is a small structure present in the thickness of the lateral thyrohyoid ligaments. Clinical-surgical implications may be related to this structure. The present study reported a case of the presence of triticeal cartilage and discussed its prevalence, distribution, and function. During dissection, a small cartilaginous nodule named triticeal cartilage was observed in the left lateral thyrohyoid ligament. Some studies suggest that the triticeal cartilage strengthens the lateral thyrohyoid ligament. However, a well-accepted theory suggests that this cartilage has no function in humans. Considering laterality and prevalence, the data found in the literature vary according to the population studied.

**Keywords:** anatomy, cartilage, surgery, larynx

### RESUMO

A cartilagem tritícea é uma pequena estrutura presente na espessura dos ligamentos tireo-hióideos laterais. Implicações clínico-cirúrgicas podem estar relacionadas a essa estrutura. O estudo visa relatar um caso de presença da cartilagem tritícea e discorrer sobre sua prevalência, distribuição e função. Durante a realização de uma dissecação, foi observado, no ligamento tireo-hióideo lateral esquerdo, um pequeno nódulo cartilaginoso denominado cartilagem tritícea. Alguns estudos sugerem que essa cartilagem serve para fortalecer o ligamento. Entretanto, uma teoria bem aceita sugere que a cartilagem não possui função em nossa espécie. Em termos de lateralidade e prevalência, os dados encontrados na literatura variam de acordo como a população estudada.

**Palavras-chave:** Anatomia; Cartilagem; Cirurgia; Laringe.

### INTRODUCTION

Triticeal cartilage is a small circular or fusiform structure present in the thickness of the lateral thyrohyoid ligament, commonly extending between the upper horn of the thyroid cartilage and the greater horn of the hyoid bone. This structure has varied prevalence in the population, is not constant in individuals, and can be unilateral, bilateral, or absent. When present, the cartilage usually does not undergo involution according to age<sup>1-3</sup>.

Embryologically originating from the fourth and sixth pharyngeal arches, laryngeal cartilages begin to develop around the 12th week of preg-

nancy and are relevant to the clinic and surgery. Although uncertain, some functions have been related to this anatomical structure. Apparently, triticeal cartilage supports the lateral thyrohyoid ligament and may be related to muscle attachment<sup>2</sup>. This structure is related to clinical implications, such as false diagnoses of hyoid fractures, and can sometimes be subjected to pathological calcifications<sup>3</sup>.

Few studies investigated the triticeal cartilage<sup>1</sup>. Thus, this study aimed to report a case of the presence of triticeal cartilage and discuss its occurrence, distribution, and function, correlating with possible clinical and surgical implications.



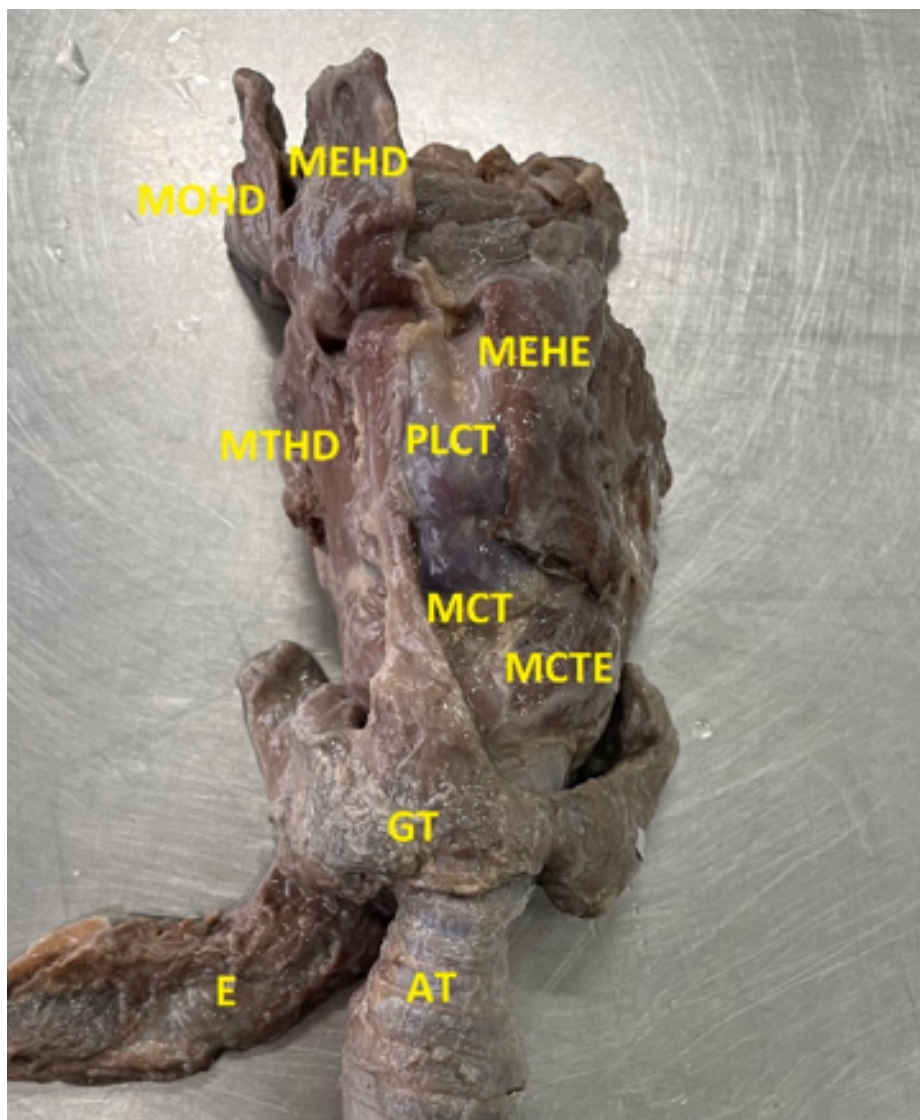
## CASE REPORT

This study was conducted at the Department of Anatomy of the Federal University of Pernambuco. During a laryngeal dissection course, six blocks of viscera from the cervical region (larynx-pharynx-trachea-esophagus) belonging to the department were dissected.

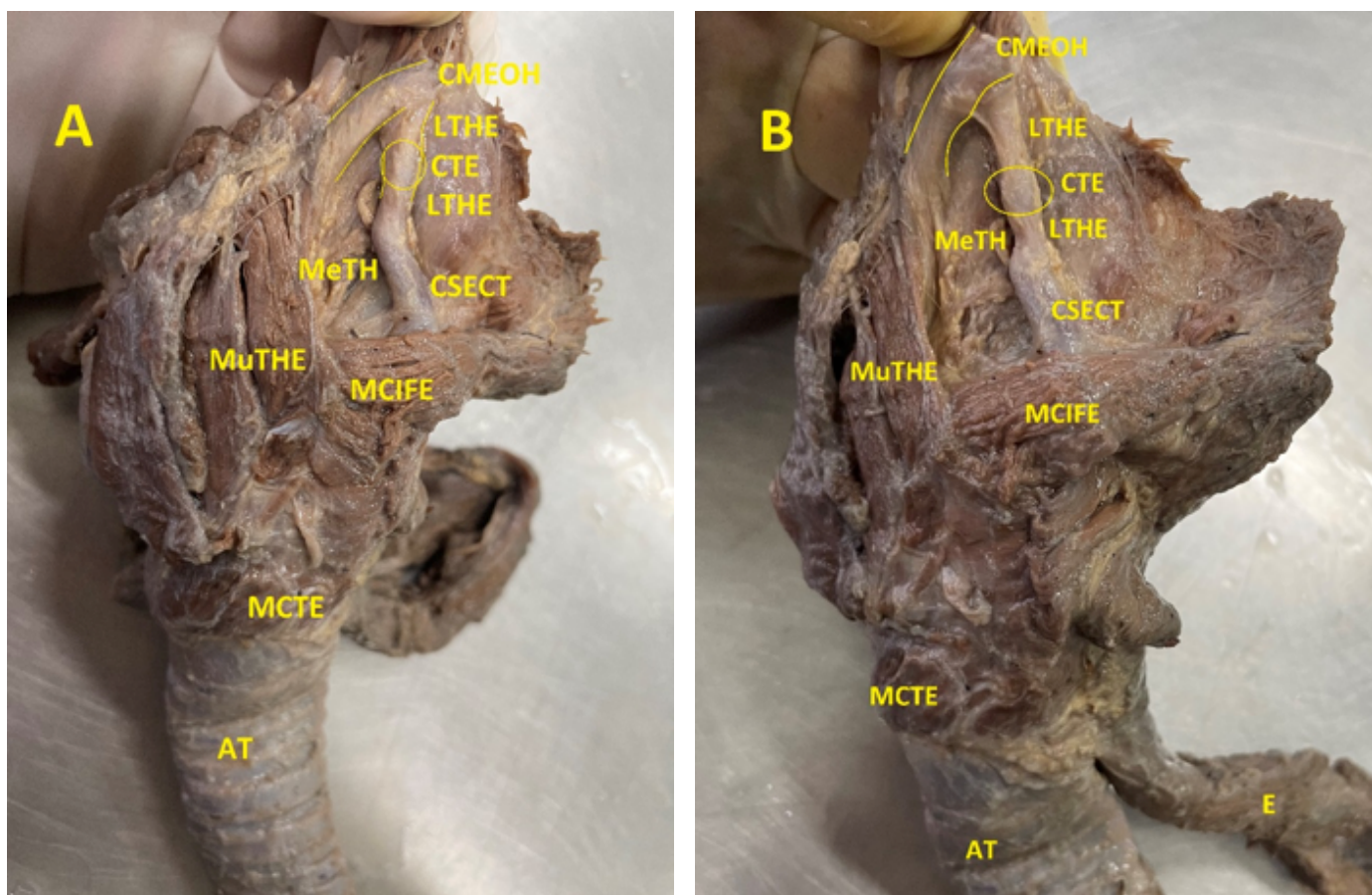
During the dissection, the blocks were initially diffused with each other (Figure 1). Then, the sternohyoid and omohyoid muscles were sectioned and folded for better visualization of the outer surface of the thyroid cartilage blades. On these surfaces, an oblique line was observed starting from the upper thyroid tubercle, located next to the root of the upper horn of the thyroid cartilage, directing downward and forward to the lower thyroid tubercle at the lower edge of the cartilage blade. In this line, the insertion of

the sternohyoid muscles and the origin of the thyrohyoid and lower pharyngeal constrictor muscles were observed.

After rebounding part of the extrinsic muscles of the larynx, the thyrohyoid membrane and the median thyrohyoid ligament were exposed. Examining the cartilaginous skeleton of the larynx laterally, the lateral thyrohyoid ligaments were observed, small fibrous cords that formed the posterior edges of the thyrohyoid membrane and extended vertically from the tips of the upper horns of the thyroid cartilage to the posterior vertices of the larger horns of the hyoid bone. In one of the dissected larynges in the thickness of each left lateral thyrohyoid ligament, a small cartilaginous nodule named triticeal cartilage (cartilaginous nucleus) was observed (Figure 2).



**Figure 1.** Visceral block of the cervical region (larynx-pharynx-trachea-esophagus) with diffused structures. Anterior view. E: esophagus. TR: tracheal rings. TG: thyroid gland. LCTM: left cricothyroid muscle. CTM: cricothyroid membrane. LPTC: laryngeal prominence of thyroid cartilage. RTHM: right thyroid-hyoid muscle. LSHM: Left sternohyoid muscle. ROMH: right omohyoid muscle. RSHM: Right sternohyoid muscle.



**Figure 2 (A and B).** The visceral block of the cervical region (larynx-pharynx-trachea-esophagus) was dissected. Anterior view. E: esophagus. TR: tracheal rings. LCTM: left cricothyroid muscle. ICMLO: inferior constrictor muscle of the left pharynx. LTHM: Left thyroid-hyoid muscle. THM: Thyrohyoid membrane. LUHTC: left upper horn of the thyroid cartilage. LTHL: left thyrohyoid ligament. LTC: left triticeal cartilage. LMHHB: left major horn of the hyoid bone.

## DISCUSSION

The triticeal cartilage, histologically composed of hyaline cartilage, can be found at the level of the third and fourth cervical vertebrae near the bifurcation of the common carotid artery<sup>4</sup>. Its prevalence varies greatly according to study and population (8% to 68%), and its length, width, and volume vary between 1.54 and 22.20 mm, 1.34 and 6.07 mm, and 3.7 and 389.0 mm<sup>3</sup>, respectively. Generally, the higher the length, the greater the volume. In addition, men are more likely to have larger triticeal cartilages than women<sup>1-3</sup>.

Around the 12th week of fetal development, the processes of chondrification and ossification of the laryngeal structures begin, which separates the superior horn of the thyroid cartilage from the greater horn of the hyoid bone. Apparently, a common variation in this process includes the formation of triticeal cartilage<sup>5,6</sup>.

Considering laterality, the presentation of triticeal cartilage is more unilateral than bilateral. However, the data found in the literature varies according to the population studied, and the bilateral presentation may be more frequent in some cases. As for sex, some studies reported a higher prevalence in men, and others did not find significant differences between sexes<sup>1,4</sup>.

The function of the triticeal cartilage is not a consensus in the literature. Some studies suggested that triticeal cartilage strengthens the lateral thyrohyoid ligament. However, individuals without this cartilage did not present deficiency or disadvantages compared with those who had it<sup>1-4</sup>. The literature also suggested that triticeal cartilage may have muscle fibers that connect it with the tongue<sup>6</sup>. A well-accepted theory states that this cartilage has no function in humans<sup>1-4</sup>.

Similar to other laryngeal cartilages, the triticeal may be subjected to calcification or ossifica-

## ARTIGO

tion<sup>1</sup>. One relevant clinical repercussion is when poor knowledge about the anatomical aspects of the triticeal cartilage leads to the misdiagnosis of fractures of the upper horn of the thyroid cartilage, usually associated with strangulation<sup>7</sup>.

When triticeal cartilage is present, the internal laryngeal nerve, a branch of the superior laryngeal nerve, runs along its lateral surface; this relationship requires awareness in anterior cervical spine surgeries and carotid endarterectomy because the nerve can be compressed during the placement of retractors, leading to potential dysfunction and increased risk of aspiration<sup>6</sup>.

Due to its location near the bifurcation of the common carotid artery, studies showed the importance of comprehending and identifying the triticeal cartilage since it can be mistaken with the atherosclerotic processes and lead to false diagnoses<sup>2</sup>.

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