

## ANATOMICAL NOTE

### The median thyrohyoid 'fold': a nomenclatural suggestion

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It was recently demonstrated (Fink, 1974, 1975) that the mechanical behaviours of the human larynx can be systematized as various degrees of folding and unfolding, or plication (plication includes both folding and unfolding). Historically, anatomical terminology anticipated this principle by adopting the term 'fold' to describe the paired soft tissue formations of the human larynx, namely the vocal folds, vestibular folds, and aryepiglottic folds (His, 1895). The folding mechanism of the human larynx, however, also involves the median soft tissue linking the thyroid cartilage to the hyoid bone (Czermak, 1861). This tissue comprises (a) the epiglottic cartilage, and (b) the pre-epiglottic body of fat and its bounding ligaments (thyroepiglottic ligament, median thyrohyoid ligament, hyoepiglottic ligament). The mucosa covering this tissue extends up on the posterior surface of the epiglottic cartilage (including the epiglottic tubercle and epiglottis) over the top of the epiglottis and down its anterior surface into the valleculae, where it continues as the mucosa covering the hyoepiglottic ligament in the upper posterior part of the pre-epiglottic body.

Anatomically, a proposal to extend the appellation 'fold' to the structurally heterogeneous median thyrohyoid tissue mass is not inconsistent with the present use of the term, which in 'vocal fold', for example, encompasses striated muscle, ligament, elastic membrane and mucous membrane and in 'vestibular fold', ligament, elastic connective tissue, yellow elastic cartilage, some muscle fibres, and the covering mucous membrane. The aryepiglottic fold, too, is of quite diverse composition, since it contains the aryepiglottic muscle fibres and the upper part of the quadrangular membrane. The interarytenoid tissue could also reasonably be considered a fold, accommodating to wide inspiratory opening of the larynx and to arytenoid apposition in glottic closure. In the last mentioned condition the anterior mucosal covering of this tissue bulges or folds forward, and the arytenoideus muscle bulges backward into the hypopharynx.

In general, viewed as a mechanical system, the primate larynx exhibits several degrees of folding, increasing in the order of inspiration, expiration, phonation, effort closure and swallow closure (Fink, 1976). The median thyrohyoid tissue is one in a set of folds that adapts the larynx to the execution of these various activities. For example, in effort closure of the human larynx approximation of the thyroid cartilage to the hyoid bone is an intrinsic part of the effort (Fig. 1A), and results in compression and backward bulging or folding of the median thyrohyoid tissue as

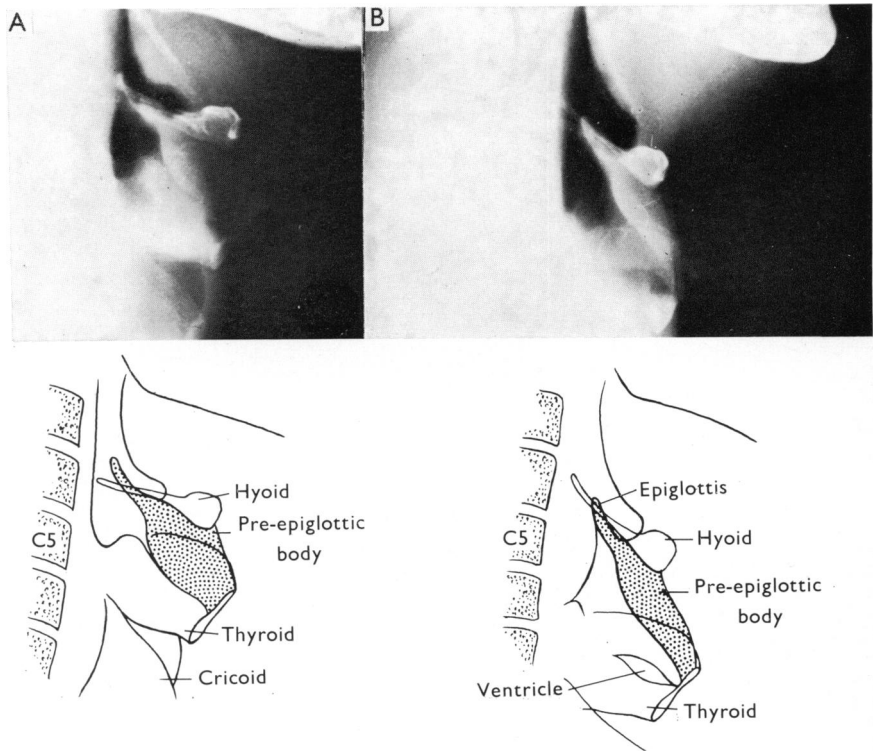


Fig. 1. Lateral radiographs of cervical region of a 42 year old man. A, Effort closure of the larynx. B, Inspiration. Note partial folding of median thyrohyoid tissues in A, and unfolding in B.

well as folding of the mucosa of the vallecula. By its apposition to the adducted vestibular folds and aryepiglottic folds the bulge hermetically seals the larynx against leakage of air from below. Compression of the median thyrohyoid tissue is seen most strikingly in swallow closure, when the above mentioned changes occur in a more extreme form and the epiglottis folds down backward over the top of the closed larynx to protect it against leakage from above. At the other extreme, in deep inspiration, there is distraction of the thyroid from the hyoid (Fig. 1 B). The median thyrohyoid tissue and the vallecular mucosa become elongated and unfolded, and attenuation of the pre-epiglottic body in the postero-anterior direction is noted in the X-ray film.

I conclude that designating the median thyrohyoid tissue a 'fold' will preserve the consistency of the anatomical nomenclature of the larynx and appreciably extend the usefulness of the nomenclature in the functional domain.

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