

The interdomal ligament does not exist*

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SUMMARY

Some authors consider the interdomal ligament to be an important structure of nasal tip support, whereas in other studies of lobular anatomy such a ligament is not mentioned at all. To clarify this question, we performed an anatomical investigation, which included macroscopical dissection and histological sectioning of 14 human cadaveric noses. Our anatomical study failed to reveal the presence of an actual ligament in the interdomal area.

Key words: nasal anatomy, nasal tip, interdomal ligament

INTRODUCTION

It is generally agreed that nasal tip surgery is one of the most difficult procedures in rhinoplasty. If inadequately carried out, it may result in serious deformities and functional disorders. Therefore, comprehension of the various tip support mechanism is a prerequisite for nasal tip surgery, especially when preservation of tip projection is warranted. Some authors claim that one of the tip-supporting structures is a transverse fibrous tissue layer between the paired domes, the so-called interdomal ligament (Janeke and Wright, 1971; Anderson and Ries, 1986; Kamer, 1988; Letourneau and Daniel, 1988; Rettinger, 1993). Other studies dealing with lobular anatomy do not mention this ligament at all (Daniel and Lessard, 1984; Daniel, 1992). This observation has induced us to study the nature of the tissue in between the greater alar cartilages, in particular the interdomal area.

Our aim was to determine if the interdomal ligament is an existing anatomical entity that has to be considered during nasal surgery.

MATERIAL AND METHODS

Fourteen human cadaveric noses were investigated. Blunt dissection was performed on two 'fresh' noses and three noses fixed in formalin to study gross anatomy of the interdomal region. Nine specimens were studied histologically. These specimens were fixed in 10% neutral buffered formalin, washed in phosphate buffer and dehydrated in a graded ethanol series. Eight of them were decalcified with 5% HNO₃ and embedded in paraffin, and the remaining specimen was embedded in frozen carboxymethyl-cellulose. With a cryomicrotome (PMV 200), serial sections of 25 µm (section interval: 250 µm) were cut along a coronal (n=7), a transverse plane (n=1), and along a plane parallel to the nasal dorsum (n=1). The sections were

stuck onto adhesive tape and stained with either haematoxylin-eosin (n=2), Mallory-Cason (n=6) or Mallory-Cason and Weigert's resorcin-fuchsin (n=1). Finally, the sections together with the tape were mounted on glass slides or thin pieces of cardboard. The interdomal ligament was then studied microscopically in all sections.

RESULTS

Macroscopical dissection via an external approach technique shows that the domes of the greater alar cartilages seem to be connected to each other by a ligamentous sling. This sling continues in a cranial direction covering the so-called "weak triangle" of Converse (1955; Figure 1).

Microscopical investigation allows a more detailed analysis of the structures involved in nasal tip anatomy. Two transverse sections were chosen to illustrate the anatomy in this area (Figures 2a and 3a). The greater alar cartilages are clearly visible. The dome region is the place of junction of the medial and lateral crus. A higher magnification of the interdomal area fails to reveal any transverse fibres connecting the two domes (Figures 2b and 3b). Instead, the area is filled with dense, irregularly interwoven connective tissue with, in close juxtaposition to the cartilage, many fibres running in a plane parallel to the perichondrial layer.

DISCUSSION

Janeke and Wright (1971) were the first to introduce the concept of an interdomal ligament, which supposedly gives support to the nasal tip. They based their observations on an anatomical study using macroscopical dissection of cadaveric noses. They did not check their findings in histological sections of the nasal tip. Many authors (Kamer, 1988; Letourneau and Daniel, 1988;

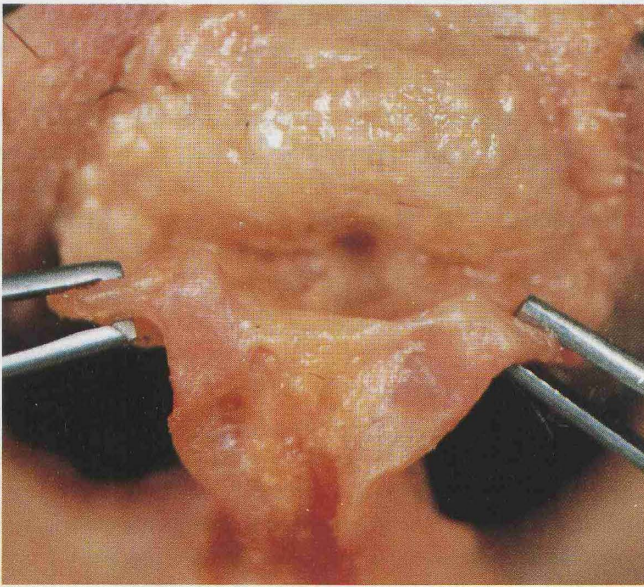


Figure 1. Cadaveric dissection demonstrating the interdomal region.

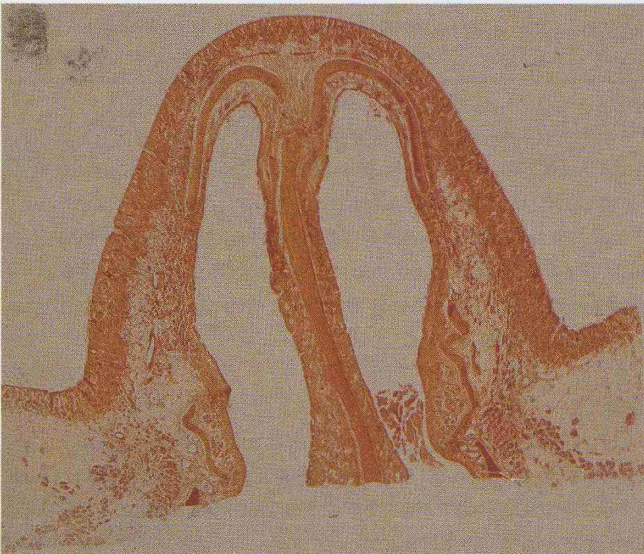


Figure 2a. Transverse section of the nose (Weigert's resorcin-fuchsin staining; $\times 2$).

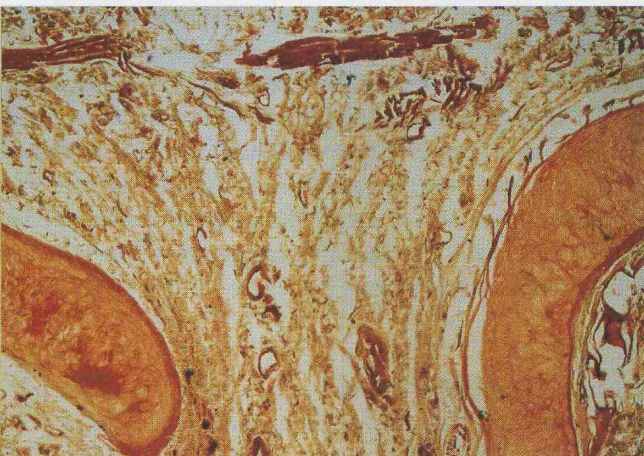


Figure 2b. Higher magnification of the interdomal region, showing the absence of a transverse ligament. Note the presence of the transverse muscle fibres of the transverse part of the *Musculus nasalis* (Weigert's resorcin-fuchsin staining; $\times 20$).

Rettinger, 1993), including established textbooks (Tardy, 1990; Tardy and Klingensmith, 1991), adopted this concept of nasal tip support.

Our study demonstrates that the paired greater alar cartilages (or: lobular cartilages) are indeed connected to each other in the interdomal region by dense connective tissue. However, the tissue in this area does not meet the histological criteria of a ligament with bundles of collagenous fibres running in one direction. The absence of such transverse fibres in the interdomal region is not surprising. Generally, ligaments are found in areas where pull is exerted in one general direction. This is obviously not the case in the nasal lobule. Besides, from an embryological point of view the presence of such a transverse ligament crossing the midline is unlikely, especially since a ligament has to develop between two separate structures (the medial nasal folds) that later fuse to form the middle part of the external nose.

The conclusion must be that an actual ligament in the interdomal region as described by previous authors does not exist.

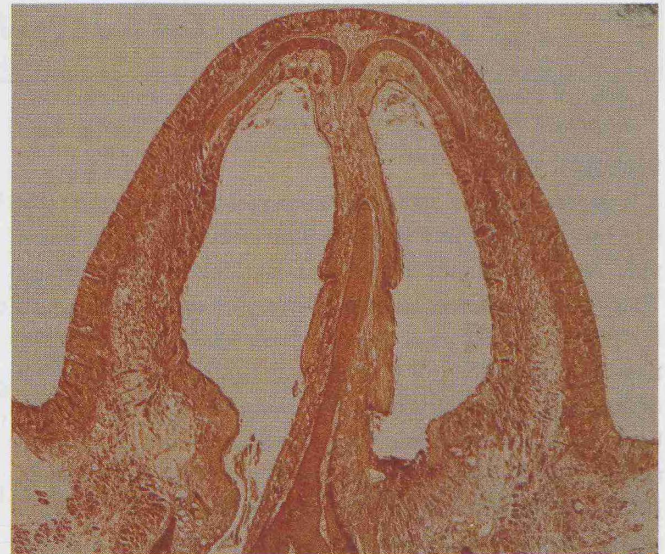


Figure 3a. Transverse section of the nose at level 3 mm below that of Figure 2a (Weigert's resorcin-fuchsin staining; $\times 2$).

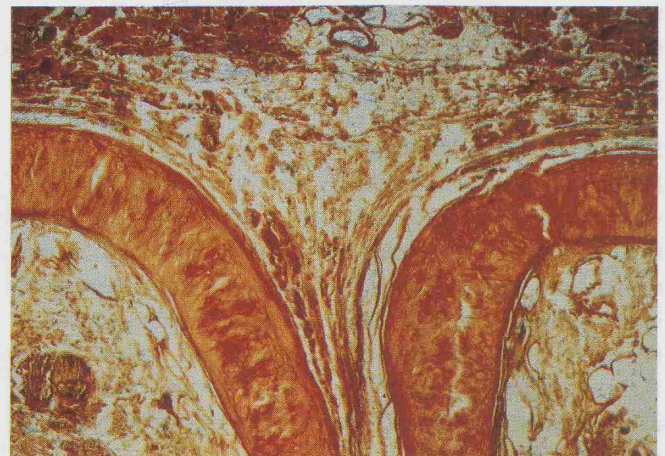


Figure 3b. Higher magnification of the interdomal region, showing the absence of a transverse ligament (Weigert's resorcin-fuchsin staining; $\times 20$).

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