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Falx inguinalis: a forgotten structure

Although inguinal hernia repair is one of the first operations taught during general surgery residency training, the anatomy of the inguinal region can remain difficult, even for senior surgeons in some cases. Tissue/suture repairs such as the McVay and Bassini-Shouldice techniques require detailed anatomical education in practice; however, these techniques have become less frequent, whereas tension-free repair with prosthetic mesh is widely used today because of its technical simplicity and low hernia recurrence rates.[1] Nevertheless, prosthetic repair is not only simple, but it is also a superficial approach that does not require surgical residents to learn the entire inguinal anatomy.

The conjoint tendon used to be a very important structure in inguinal hernia repair. It has long been accepted to be the landmark of the modified Bassini repair that was widely used until the1990s. Anatomy textbooks have described it as follows: 'Buried among the names of structures real or imaginary in the inguinal region is the term conjoined tendon'.[2] The conjoint tendon is the fusion of the lower fibres of the internal oblique aponeurosis with the fibres of the transversus abdominis. However, anatomists and surgeons have observed that this structure does not exist in many individuals.[3–5] While inguinal anatomy was still developing at the end of the 19th century, anatomists were prone to call this structure the 'falx inguinalis'. On the other hand, the ligament of Henle is called falx inguinalis by some anatomists.[2] This ligament is an infero-medial expansion of the lower fibres of the internal oblique aponeurosis.

Falx is a Latin word that originally means sickle. It also generally means a tool with a curve or arch. From the anterior view, the conjoint tendon or falx inguinalis may be white in colour medially; however, this whitish appearance is not usual around the internal inguinal ring. The senior surgeon, who is the author of the present paper, has seen the conjoint tendon or falx inguinalis with a white colour and tendinous appearance in only two inguinal hernia repairs out of thousands of cases. It appears that the structure has been a superior-medial extension or crus of the inguinal ligament. The operative photograph was examined by anatomists who have a special interest in the inguinal region, and was identified as a rare appearance of the lateral part of the conjoint tendon or falx inguinalis (Fig. 1). The schematic drawing in Figure 2 explains the detailed anatomy of the same area. We focused on this area by employing serial cadaver dissections and identified the same whitish structure again (Fig. 3).

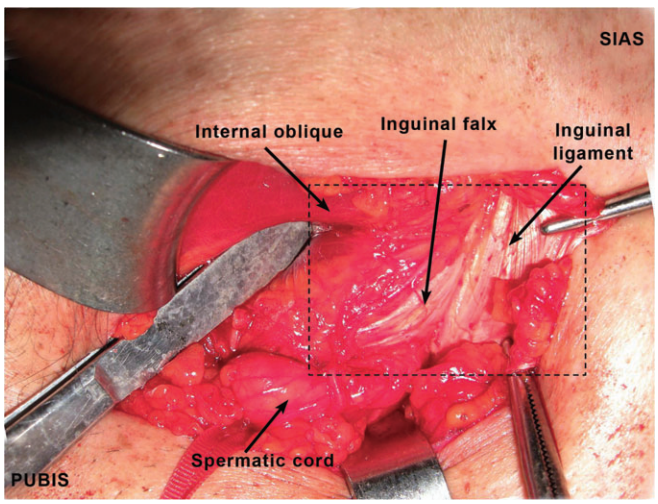

Fig. 1. Intra-operative appearance of falx inguinalis. It is seen lateral to the internal inguinal ring.

Internal oblique muscle with the transversus abdominis has been known to create a shutter mechanism against inguinal hernia development,[3,6] although some authors have questioned the existence of this mechanism.[7] When intra-abdominal pressure rises during daily activities or heavy lifting, the muscles and their aponeurotic extensions contract and approximate down to the inguinal ligament. This action reinforces the posterior wall of the inguinal floor and prevents herniation. However, it is not easy to assess the merits of a more laterally aponeurotic falx inguinalis for hernia prevention. This lateral structure may prevent indirect herniation from the internal ring, but we should mention that one of the two hernia cases presented here is already indirect.

The conjoint tendon or the arch of the internal oblique muscle is used in some tissue/suture repairs for inguinal hernias. We also use these structures to narrow a large internal inguinal ring before laying a prosthetic mesh for indirect hernias. This constriction can be done by using one or two interrupted sutures with absorbable or non-absorbable material medially or laterally to the internal ring. However, the benefit of extension of the conjoint tendon has not been evaluated.

The original image that is presented here is a rare occurrence in a very common surgical procedure. The importance of this anatomical

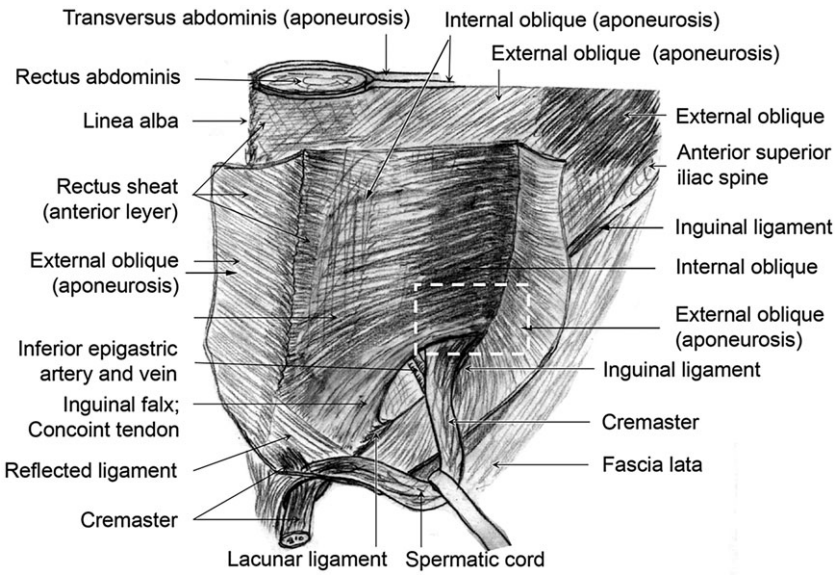

Fig. 2. Schematic drawing of the inguinal floor. Falx inguinalis is shown in dotted rectangle that corresponds to a similar rectangle in Figure 1.

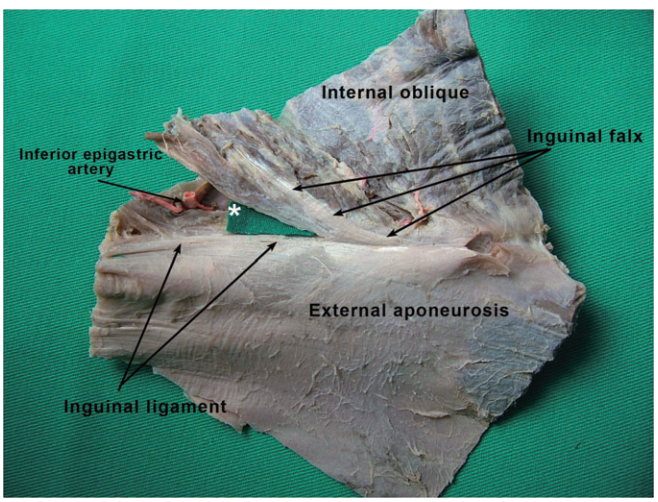

Fig. 3. Cadaver dissection shows falx inguinal lateral to the internal ring indicated by '*'.

structure is not clear. However, we think that this sort of case is valuable for remembering the forgotten structures of the anatomy of the inguinal region.

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