Original article

Dissecting study of subperitoneal tissue of the female pelvis

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Abstract: Many studies supported the existence of a real fascial pelvic retroperitoneal system closely related to the endopelvic fascia. To better understand the organisation of the retroperitoneal fibroadipose tissue, dissections of 25 un-embalmed female pelvis were performed. Proper fibrous ligaments connecting the viscera with the pelvic walls were not identified, but connective condensation where the vessels were numerous and larger were recognised. Thin connective laminae surround the vessels adventitia and are connected with the septa between the adipose lobules. The 3D arrangement of the fibroadipose tissue corresponds to a mesh of thin connective laminae that borders the small adipose lobule and are connected with the visceral adventitiae, the vasculonervous sheath and the parietal pelvic lamina, constituting an anatomical device, which, passing the functional limits of any individual ligament, has elastic supporting properties. In absence of real ligament, the fibroadipose pelvic tissue could have not only the passive role of filling the spaces, but also an active role with supporting function coming from the intrinsic tissue proprieties and from the muscular tension of the pelvic floor.

Key words: Pelvis; Woman; Prolapse; Fibroadipose tissue; Anatomy.

INTRODUCTION

The space between the pelvic peritoneum and the pelvic fascia is filled with fibroadipose tissue (FAT) that surrounds the viscera, the vessels and the nerves of the pelvic cavity. A system of fibrous connective bundles with antero-posterior direction (sacro-pubic laminae of Farabeuf) and with transversal direction (cardinal ligaments of Mackenrodt) is described. These ligaments are considered to allow intrapelvic organs relative mobility while maintaining their position.[1] Histological studies on FAT of different pelvic regions have demonstrated that the pelvic ligaments don't correspond to a classic ligament (dense, regular connective tissue with fibres regularly oriented to form thick bundles).[2] Dissecting studies on cadavers demonstrated the absence of true ligament in the female pelvis.[3] To better understand the organisation of FAT, dissections of the un-embalmed female pelvis were performed.

MATERIALS, METODS AND RESULTS

Anatomical dissection was undertaken in 25 female unembalmed cadavers (range: 35-72 years old), without a history of pelvic diseases. The pelvic peritoneum was dissected at the level of the anterior lamina of the broad ligament with a sagittal direction towards the pubis body, midway between the viscera and the lateral pelvic walls. After the section of the round ligament, at the level of the medial third, the two peritoneal flaps were dissected with lateral and medial direction.

With a moderate traction of the uterus, a gradual removal of the FAT of the bladder pelvic space was performed. The obliterated umbilical artery and the obturator vessels and nerves were identified, closed to the lateral pelvic walls. The uterine artery, surrounded by the venous vessels of the uterovaginal plexus showed a lateromedial course, with an anterior obliquity. The pelvic part of the ureter was found medially to the uterine vessels and run in proximity of the superior portion of the lateral vaginal wall. The removal of the adipose lobules showed thin translucent, very fragile laminae. Between the ureter and the vaginal walls, the FAT was thicker and the removal of the lipidic part of it was performed, with visualisation of the small whitish nervous bundles. Connective thickening ascribable to ligaments were not found. At the level of the bladder a fibroadipose lobular lamina (3-4 mm thick) was easily isolated, placed on its anterior surface. In the pararectal space the pararectal nervous bundles with sagittal course were easily identified, corresponding to the hypogastric plexus (Figure 1).

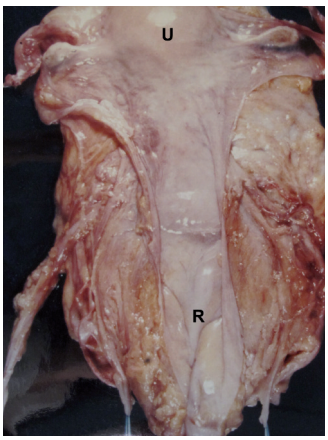

Figure 1. – Schematic representation of the topography of the inferior hypogastric plexus (dotted lines) and the nerves for the pelvic viscera, uterus (U) and rectum (R).

DISCUSSION

Many studies supported the existence of a real fascial pelvic retroperitoneal system closely related to the endopelvic fascia.[4-6] During our dissections, proper fibrous ligaments connecting the viscera with the pelvic walls were not identified, but connective condensation where the vessels were numerous and larger was recognised. In the parametrium a rich mesh of venous vessels close to the uterine artery and terminal part of the ureter was documented. Thin connective laminae surround the vessels adventitia and are connected with the septa between the adipose lobules. The dissection of the FAT at the level of the sacrouterine folds demonstrated the presence of nervous bundles, corresponding to the inferior hypogastric plexus, surrounded by the areolar connective laminae. The 3D arrangement of the FAT corresponds to a mesh of thin connective laminae that borders the small adipose lobule and are connected with the visceral adventitiae, the vasculonervous sheath and the parietal pelvic lamina, constituting an anatomical device, which has elastic supporting properties. In absence of real ligament, the FAT could have not only the passive role of filling the spaces, but also an active role with supporting function coming from the intrinsic tissue proprieties and from the muscular tension of the pelvic floor.[2] In conclusion, the FAT is the key element of the topographic anatomy of the female pelvis. In fact, in analogy with the mediastinic tissue, it linked the viscera and the pelvic walls, filling the interposed spaces and giving support to the vasculonervous structures.

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