Denonvilliers’ fascia: Gender differences of its fascial architecture

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BACKGROUND: Whereas the existence of Denonvilliers’ fascia (DVF) in either sex remains controversial, its identification at operation is considered important when mobilising the distal rectum for cancer or during radical retropubic prostatectomy or rectocele. The original description of the fascia was based exclusively on Denonvilliers’ findings in 12 adult male cadavers though Denonvilliers gave no account of its existence in women. Much of the controversy in the literature concerns the origin and development of the fascia which is said to arise from a “fusion”, a “condensation of embryonic connective tissue” or both to form a mature, "multilayered” structure. The aim of this study was to investigate the detailed architecture of DVF in adult cadavers using a combination of epoxy sheet plastination and confocal microscopy techniques. METHODS: Nine cadavers (6 males, 3 females; age range, 46-87 years) were prepared as nine sets of transverse (4 sets), coronal (1 set) and sagittal (4 sets) plastinated sections. The sections were examined under a confocal laser scanning microscope. This study was performed in accord with our institutional ethical guidelines and approved by the institutional ethics committees. RESULTS: In the male, the membrane-like structures in the prerectal space represented predominantly fibres originated from the external urethral sphincter (EUS), together with fibres from the longitudinal rectal muscle (LRM) and the connective tissue sheaths of the neurovascular bundles. In the female, at the level of the external anal sphincter, the muscular and tendinous fibres from the rectal and vaginal walls intermingled with each other and no distinct fascial layer was identified. In both male and female, the peritoneum did not descend deeply within the prerectal space. CONCLUSIONS: There is no clearly identified membranous layer consistent with DVF in either sex. However, the fascial configuration in the prerectal space appears different between the male and female. The fibers from the EUS in the male and LRM in both male and female may have been misidentified as a multi-layered DVF in previous studies. Thus, the correct plane for anterolateral mobilization of the rectum should be essentially posterior to the multilayered “DVF”.