Microscopic and Ultra-microscopic Evidences of Micro-trauma at the Endometrial-Myometrial Junctional Zone in Adenomyosis

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Context: The ectopic presence of endometrial glands and stroma in the myometrium hallmarks the adenomyosis (AM). AM-uteri exhibit hyper-/dysperistalsis which induces mechanical tension at the Endometrial-Myometrial Junctional Zone (EMJZ). This in turn favours the translocation of the basal glands into the myometrium.

Objective: Is there any (ultra) - microscopic evidence of micro-trauma at the EMJZ in AM patients:

Patients: Twenty-five premenopausal women were assigned into two groups; AM (n=11) and non-AM (n=14).

Intervention: Laparoscopic-assisted vaginal hysterectomy was done at Charite Universitaetsmedizin in Berlin.

Methods: Specimens from the anterior, posterior uterine walls and the fundus (at midline) being the area of maximum mechanical tension. Immunohistochemistry staining for collagen I, alpha smooth muscle actin (ASMA), TGFß receptors 1, 2 and 3, CTGF, van Gieson stain (vG) and transmission electron microscope (TEM) were done.

Main Outcome Measure: The presence of myofibroblasts, the arrangement of inner myometrial cells and the ultrastructural changes in the glandular epithelial cells.

Results: ASMA was significantly expressed in the basal stroma of AM than control, while collagen I was significantly higher expressed in the inner myometrium. TGFß receptors and CTGF didn't show any difference. vG stain revealed the loss of the parallel arrangement of the inner myometrial cells in AM. TEM revealed the nuclear membrane infoldings of the basal glandular epithelium and the disruption of the endometrial-myometrial interface in AM.

Conclusion: Non-AM uteri exhibit myofibroblasts supporting the dynamicity of the uterus. The abundant myofibroblasts in AM may support the presumed increased mechanical tension at the EMJZ. The inner myometrium in AM loses it parallel arrangement while the basal glandular epithelium showed ultrastructure features of micro-trauma.