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**Title:** MRI OF THE AGING FEMALE PELVIC FLOOR; A 3D PERSPECTIVE OF ITS PRINCIPAL ORGANIZATION

**Aims of Study:**

Pelvic floor [PF] structure and function changes with increasing age and the question as to which of these changes are associated with urinary incontinence remains to be established. Because of causative relationship between the incidence of stress urinary incontinence and age, an understanding of the mechanism of action of the PF in preventing urinary continence requires a clear understanding of the interplay between its anatomical/functional components in terms of age. Furthermore the new diagnostic tests using imaging, designed to evaluate pelvic floor function relevant to urinary continence, are based on the concept of examining: the anatomical integrity of the skeletal musculature of relevant muscles in terms of contractility the adequacy of the neuronal supply to these muscles in terms eliciting adequate recruitment rate secondary to the initiation of the guarding reflexes the biomechanical properties of the interconnecting tissues and their attachment to the sacral and pelvic structures. This presentation attempts to demonstrate the differences in the anatomical/functional characteristic of the PF of asymptomatic of young and old normal subjects.

**Methods:**

Data were obtained from 16 volunteers having a mean age of 35 years and 18 peri-menopausal women 55 years old. Using MRI in the supine position, the 3D configuration of the PF was reconstructed using 7 consecutive planes in each of the axial, sagittal and coronal dimensions. Based on the imaging obtained from these 2 age groups.

**Results:**

The combined reconstructions demonstrate the variations in the path of the pubococcygeus muscle originating from the pubis passing along the urethra, vagina, and rectum, to the rectum, attachment to the distal half of the vagina, and inserting between the internal and external anal sphincters. The 3D reconstruction, as illustrated by the figure above, shows the fundamental features of the MRI derived configuration of the bony structures and the relative displacement of the pubococcygeous muscles surrounding the vagina. Furthermore from this reconstruction, which can be rotated in space, derivation can be made of the the origin of the iliococcygeus to demonstrate the relatively large range of motion of the PF muscles in younger women and the significantly restricted displacement in the older women. The age related differences in the anatomical/functional imaging of the PF demonstrate the detailed anatomy of the levator ani muscle and introduce the concept of the age related Delta PF-Volume to voluntary contraction. The results demonstrate the extent of redundancy in PF function before demonstrable urinary incontinence emerges as a clinical problem.

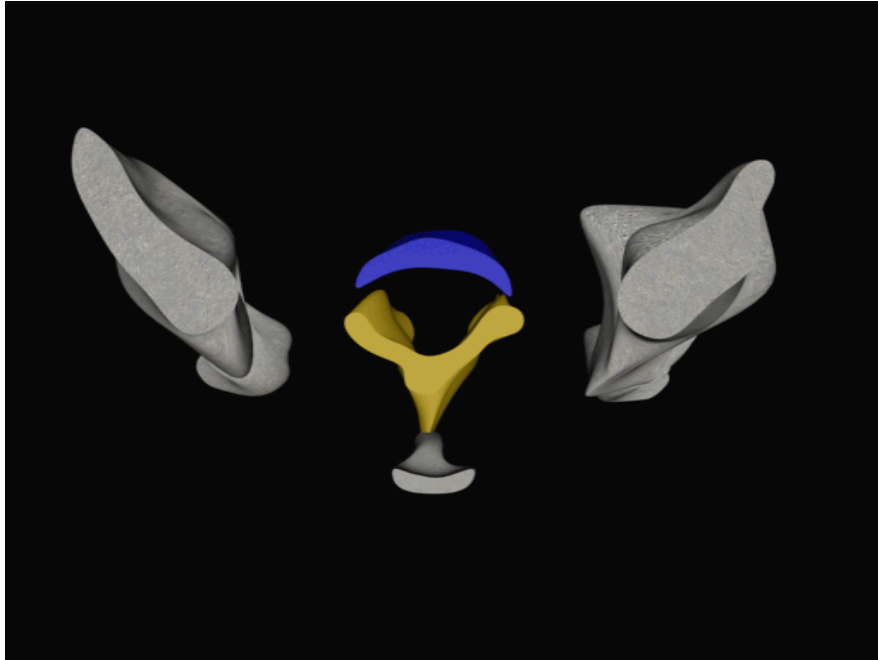


Figure 1: 3D Reconstruction showing the displacement volume of the pubovaginalis.

**Conclusions:**

The 3D visualizations suggested that, with the minimum of testing, the damage to the continence mechanism can be localized, and the appropriate treatment plan selected. Indeed if conservative treatment of the patient who has lost neuromuscular control of pelvic floor muscles is selected, the appropriate diagnostic test can save the subject from prolonged and frustrating efforts of attempting pelvic muscle strengthening that is futile. By contrast neuromuscularly intact patients having weak muscles may be treated with exercise.