



Pelvic Floor Anatomy & Function: Several Muscles & Several Functions

W38, 30 August 2011 14:00 - 17:00

Start	End	Topic	Speakers
14:00	14:10	Introduction	<ul style="list-style-type: none"> • Ravinder Mittal
14:10	14:35	3D Ultrasound Imaging Perspective of Anatomy and Function	<ul style="list-style-type: none"> • Hans Peter Dietz
14:35	15:00	Urethral Function & Pelvic Floor Muscles	<ul style="list-style-type: none"> • Chris Constantinou
15:00	15:30	Discussion	All
15:30	16:00	Break	None
16:00	16:25	Functional Anatomy Pelvic Floor Muscles – MRI, 3D-US & Advanced Manometry	<ul style="list-style-type: none"> • Ravinder Mittal
16:25	16:50	Measurement of Pelvic Floor Muscle Function – Various techniques	<ul style="list-style-type: none"> • Kari Bø
16:50	17:00	Discussion	All

Aims of course/workshop

Pelvic floor is relevant to many subspecialties, i.e., gynecology, urology, urogynecology, colorectal surgery and gastroenterology. Pelvic floor disorders are many since these muscles serve important functions to many different organ systems and their dysfunction causes anal & urethral incontinence, organ prolapse and many other disorders. Controversies continue to surround anatomy, neural innervations and functional assessment of these muscles. MRI, 3D-Ultrasound imaging and new pressure/force measurements have shed important light into the anatomy and function of these muscles. Goal is to highlight these advances. Novel approaches and important insights into this area of medicine will be covered in this important workshop.

Educational Objectives

Important advances in the understanding of pelvic floor muscles and disorders will be covered in this workshop

Speakers and Summary of their Presentation

Hans Peter Dietz MD: Surely there is more disagreement than agreement regarding the assessment of pelvic floor anatomy and function, between clinicians and researchers, between imaging specialists and clinicians, and between ultrasound and MR practitioners. Dr Dietz will cover the following areas: **1:** Ultrasound and magnetic resonance imaging in the pelvic floor assessment. **2:** Urethral support and its role in continence: what's stopping people from leaking? **3:** How to prevent, diagnose and treat levator macro- and micro-trauma? He will summarize how far we have come over the last ten years in translating clinical imaging research into practice, and will also attempt an outlook on what to expect over the next decade.

Chris Constantinou PhD: Pelvic Floor Muscles (PFM) contributes to a variety of functions ranging from the mechanical support of abdominal contents to conception, delivery, urinary and fecal continence. Consequently their response varies according to the purpose demanded and can be voluntary or triggered by reflex reactions. In this presentation identification will be made of the biomechanical factors involved in the kinematic response of major contained structures as the bladder, urethra and rectum using ultrasound imaging. Visualizations will be presented of the active reflex reaction of the anatomical displacements such as coughing as well as the passive response to voluntarily initiated actions such as straining and contractions. Results will focus primarily on the normal response of asymptomatic subjects and some the differences in subjects with urinary incontinence. The influence of posture in considering the results will be demonstrated in terms of new parameters developed specifically for these studies. Distinction will be made between the visualization of pelvic floor dynamics measured using imaging and the vaginal force measurements using a probe. Controversies surrounding the strengths and weaknesses of each type of measurement will be illustrated using video presentations.

Ravinder K. Mittal MD: Along with internal anal sphincter, external anal sphincter, puborectalis muscle plays important role in the pathogenesis of anal continence. Whether external anal sphincter consists of 3 parts, subcutaneous, superficial and deep parts or only 2 parts i.e., subcutaneous and superficial has been debated for more than 50 years. It turns out that deep part of the external anal sphincter is indeed puborectalis muscle. Furthermore, new study show that external anal sphincter is actually has a purse-string morphology. Current understanding is that the rest and squeeze pressures of the anal canal are related to internal and external anal sphincter respectively. Puborectalis muscle is responsible for the formation of anorectal angle formation, however, recent studies show that it is responsible for the closure of upper half of the anal canal. How does puborectalis muscle cause closure of the anal canal? Since it is a "U" shaped muscle, upon contraction it causes closure of the pelvic floor hiatus and compresses anal canal against vagina and urethra. Therefore, it is likely that puborectalis muscle is involved in the continence functions of both anal canal and urethra. Pelvic floor function is assessed by techniques that measure vaginal pressure/force, either digitally or through various other techniques and instruments. Levator-ani or pelvic floor muscles have 2 major functions, i.e., constrictor and elevator. Studies show that the constrictor function of pelvic floor is contributed by puborectalis muscle and elevator function is likely related to ileococcygeus muscle. Dr Mittal will discuss how novel imaging techniques, 3D-US, MRI and high definition manometry help in assessing physiologic functions of pelvic floor, i.e., the constrictor and the elevator functions.

Kari Bo PhD. Norwegian University of Sport & Physical Education, Oslo Norway -Responsive, reliable and valid measurement tools are important in assessing pelvic floor muscle function and strength. Visual observation and digital palpation are important methods in the clinic to assure that the patients are able to contract correctly and to give feedback of the contraction. However, these methods are not reliable enough for measurements of muscle strength or automatic responses. Pelvic floor muscle strength can be measured with manometers and dynamometers. Ultrasound and MRI can reliably measure muscle morphology during rest and contraction, and automatic responses to single task activities such as coughing and increases in intra-abdominal pressure.