

WORKSHOP M1 — THE PELVIC FLOOR IN MEN

Chair: Bert Messelink, Dirk-Henrik Zermann

ANATOMY AND PHYSIOLOGY OF THE MALE PELVIC FLOOR

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The female pelvic floor has been and is being studied extensively by urologist, gynecologists, physiotherapists and coloproctologists. The knowledge about the male pelvic floor has remained more static.

Introduction

Several clinical topics such as post-prostatectomy incontinence, erectile dysfunction, prostatodynia, pelvic floor spasticity syndrome, nerve-sparing surgery rely on a good understanding of the anatomy and physiology of the pelvic floor. Many classic pictures on pelvic anatomy have to be revised based on recent understandings.

The aim of this lecture is to give an update of the anatomical and physiological concepts on the male pelvic floor, linking them to clinical relevant topics.

Anatomy and physiology

Advanced anatomical dissections, MRI-imaging, computer modelling and 3D reconstruction offered a revised view of pelvic anatomy¹. The lateral surfaces of the levator muscle are oriented vertically and cover the entire lateral surface of the prostate. The bladder is positioned anteriorly to the prostate instead of cranially. The trigone and anterior fibromuscular stroma of the prostate appear as a single unit. The striated sphincter appears circular with the biggest bulk of tissue posteriorly. The external sphincter is an independent morphological unit separated from the surrounding pelvic floor by connective tissue.² The neuro-anatomy will be reviewed in detail.^{3,4,5,6}

The central innervation based on new insights from functional MRI data and PET scan data will be reviewed.

Clinical topics

Testing of the male pelvic floor will be addressed.

Post-radical prostatectomy is an important issue. The role of pelvic floor rehabilitation and the anatomical and functional background for treatment will be discussed.

Pelvic floor spasticity, prostatodynia and perineal pain syndrome are common in general urological practice. The role of the pelvic floor in these clinical problems will be reviewed.

Sexual dysfunction such as mild erectile dysfunction and premature ejaculation may be treated with pelvic floor rehabilitation techniques.

Many pelvic floor dysfunction are linked together and do not occur as isolated phenomena. An integrated view on the male pelvic floor must include attention for anorectal problems also. A framework for urologists will be developed.

Conclusion

The male pelvic floor deserves further attention. Currently anatomical and physiological knowledge offers new insights leading to improved diagnostics and treatments.

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LOWER URINARY TRACT SYMPTOMS AND THE MALE PELVIC FLOOR

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Despite a broad spectrum of neuourological diagnostic tools it is often impossible to define the cause for symptoms of lower urinary tract dysfunction. This diagnostic limitation is also a problem for the development of new therapeutic concepts.

Pelvic floor disfunction

Changing our narrow view on the lower urinary tract towards a holistic approach including the whole pelvic cavity may bring more light into lower urinary tract and pelvic organ pathophysiology. Especially the striated pelvic floor muscles may play a crucial role in patients with chronic lower urinary tract dysfunction. This is valid for neurogenic as well as for non-neurogenic, for behavioral diseases, i.e., urgency and chronic urinary retention.

The striated pelvic floor muscles are an important anatomical structure modulating the functional interplay of the different pelvic organs. Dysfunction of the pelvic floor may generate or support lower urinary tract symptoms as well as chronic pelvic pain states.

Neurological disregulation

On the other site abnormalities in the central nervous system are reflected in end-organ behavior. It is therefore consistent that neural dysregulation of the lower urinary tract and other pelvic organs would be expressed as sensory and/ or motor disturbances of pelvic organs and/ or the pelvic floor.

To be presented

The lecture will provide a basis for the discussion of the difficult interplay between the visceral pelvic organs, the striated pelvic floor muscles and the central nervous system.

UROGENITAL PAIN IN MEN AND THE ROLE OF THE PELVIC FLOOR

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Pain in the region of the lower abdomen, the genitalia and the groin can be a very difficult complaint. In women much more research has been done on this subject than in men. The terminology for this problem has not been completely settled by now. I prefer the term "Chronic Pelvic Pain (CPP)" because this is descriptive and that is important. In this presentation CPP will be described and the relation with the pelvic floor (PF) elucidated.

Pelvic floor dysfunction.

In men the pelvic floor muscles (PFM) do have two functions. First they have to support the closing mechanism of the urethra and anus. The second function is to relax during voiding and defecation thereby lowering the outflow resistance. The role of the PFM during sexual activity is also both contracting and relaxing. In men the support function is less important than it is in women. Therefore complaints of an underactive pelvic floor are seldom in men. The overactive PF on the other hand, is frequently diagnosed in men. An overactive PF will give complaints of the lower urinary tract: reduced urinary flow, abdominal straining, frequency and post-void residual urine. In the anorectal system constipation is the most frequently heard complaint. The overactive PF can also be the cause of erectile dysfunction. Some kind of men are at risk for developing an overactive PF. Especially those men that train themselves to hold their urine for longer periods. Men working in restaurants, teachers and truck drivers are well know to develop this habit. They postpone voiding by contracting their PFM. When they void they do that because there is time and not because they feel a desire to void. In that case the flow will be bad and abdominal straining is used to improve it. But, by reflex, the PFM will contract during straining. This leads to a dysfunctional voiding pattern. In most cases complaints will start in one system (bladder) and then spread to the others (anorectal, sexual).

Pain.

According to the International Association for the Study of Pain (IASP) the definition of pain is: "an unpleasant subjective, sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"¹. From this definition it is clear that both physical (sensory) and psychological (emotional) elements play a role. "Each individual learns the application of the word through experiences related to

injury in early life" is another important statement in the taxonomy of the IASP. This makes pain a very individual complaint and thereby difficult to treat. The social environment is also playing its role. "Pain is what the patient who has pain tells you that it is" "And it exist every time when he says it exists"². All these phrases should be kept in mind when treating patients with pain.

Many theories about pain modulation have been developed. Some will be addressed in this presentation.

- Gate theory: In the process of transmission of signals from peripheral nerves to the spinal cord (the gate) the information can be changed. When the gate is open the information will reach the CNS, otherwise it will not. The status of the gate can be influenced by higher centers³.
- Sensitization: When the same information is repeatedly transmitted by the same nerves, the system will become more sensitive for this information. This can happen at both the peripheral and the central nervous system. A comparable process is called wind-up.
- Receptive fields: A nerve is connected to a certain area of skin, this is called the receptive field. These fields can change and they can overlap with each other. Nociceptive information from one field can have consequences for other fields. In practice this will increase pain or increase the area the pain is felt in.
- Neurotransmitters: Our own body makes morphine like substances that can modulate the pain. The role of neurotransmitters is important and many transmitters are known by now. For medical treatment this is an important mechanism to be influenced.

Pelvic floor and pain.

The PF is made up of muscles. The dermatomes of the pelvic and genital regions are S₂-S₄. The innervation of the PFM comes from the same segments. This reflects a clear relation between the area of pain and the PFM. The following theories about this relation will be explained.

- Myogenic: by contracting the PFM often and during a long time, myalgia will develop in the area of the PFM. Patients may identify this as pain from within the lower abdomen, the prostate or the perineal region.
- Neurogenic: changes in the pattern of activity of the PFM will lead to changes in the central nervous system (sensitization and receptive field changes)⁴.
- Psychological: CPP is one of the so called stress-induced pain syndromes. The stress that is inducing the pain can be of different origin. Stress related to work or relation is an important example.
- Psychotraumatic: psycho-trauma, of any kind, can result in a feeling of unsafety many years after the trauma. When people recognize the feeling of unsafety they will contract there PFM. This is an integrated part of the fight, flight, fright reaction. When you are in danger you're not going to void. At the end this can lead to complaints of an overactive PF and to pain. The pain itself can render a positive effect because it gives one a reason to avoid these kind of situations.

Classification.

In the classification of prostatitis the term Chronic Pelvic Pain Syndrome was included⁵. I think that chronic pelvic pain is not a syndrome in the field of prostatitis. CPP is a descriptive diagnoses of pain in the pelvic region. One of the important practical points is that you should try to convince the patient that nothing is wrong with his prostate. Too many men have been sent to warm baths for their prostatitis instead of having been treated for their CPP. Classification should be done within the frame of pain classifications. Classifying the pain by mechanism in combination with the anatomical localization may be the best way to do.

Practical conclusions.

A patient who says he has pain, has pain. This patient visits you to get rid of his pain. Only when all aspects of pain are taken into account in diagnostics and treatment, this patient will have a chance. It is important to have a physical aspect in your therapeutic plan. In CPP this means correction of the PF dysfunction by education and physical therapy. It is of the same importance to include the psychological aspect in this case by psychological or sexuological counselling. Relaxation of the pelvic floor might lead to relaxation of the mind and vice versa. Experiences from early life may become very lively remembered. One should consider to make a clear therapeutic plan and make agreements with the patient. Otherwise they might start (or continue) to medical shopping with their pain. This is especially important because the treatment is multidisciplinary in its nature. To conclude, not all men with CPP will complete recover, but the quality of life will improve in many of them.

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PELVIC FLOOR REHABILITATION IN MALE URINARY INCONTINENCE AND ERECTILE DYSFUNCTION

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The aim of this presentation is to give a review of the efficacy of physiotherapy as treatment of urinary incontinence in men. Physiotherapy includes pelvic floor muscles exercises, biofeedback, electrical stimulation, bladder training and life style changes.

Male incontinence

Urinary incontinence in the male population is not as high as in females but it needs to be adequately managed. The evaluation of the usefulness of physiotherapy for men with incontinence was hampered by the paucity of literature in the field.

Men may suffer urinary incontinence from many causes. Incidence of enuresis nocturna in the male adult population is 0,6%. Although the success rate of therapy for children with this disorder is high, less attention is given to adults. Incontinence caused by neurological disorders (spina bifida, MS, stroke, Parkinson) is minimally treated with physiotherapy. The efficacy of the therapy is based on a good selection of patients.

Post-prostatectomy

Prostatectomy is one of the major causes of urinary incontinence in the male population and most studies on physiotherapy are directed to this problem. The incidence of incontinence after transurethral and transvesical prostatectomy is distinctly lower and incontinence resolves quicker than after radical prostatectomy. Beneficial effects of re-education programmes were suggested but the effect of spontaneous recovery was not taken into account. The effectiveness of a physiotherapeutic approach for incontinence after prostatectomy can only be evaluated in controlled studies. On this moment only a few randomised controlled studies are published about the efficacy of physiotherapy for incontinence after prostatectomy. Those studies have shown that pre-operative physiotherapy, biofeedback or electrical stimulation did not significantly reduce time to achieve continence. Three studies have proved that improvement in duration of incontinence was significantly better in the experimental group that received physiotherapy than in the control group.

Elderly incontinence

Recent advances in health care along with the increasing ageing of the population create a demand for the treatment of urinary incontinence in the elderly. As well as exercises as bladder training has been studied in this population. Detrusor instability, dementia, medications, poor bladder compliance contributes to urinary incontinence.

Post-micturition dribbling is a minor pathological condition caused by pooled urine in the bulbous urethra but pelvic floor exercises and urethral milking have proved to be effective to reduce the problem. Life style interventions like reduction in body weight and cigarette smoking, reduction in caffeine, fluid and alcohol intake and postural changes have been proposed to reduce the severity of incontinence, although little research in this field is done. Considering the absence of side effects, the low cost and no risk level, pelvic floor re-education should be considered as a option in alleviating the problem of incontinence but further research is required to determine when men are most likely to benefit from this therapy.

PELVIC FLOOR REHABILITATION IN MALE URINARY INCONTINENCE AND ERECTILE DYSFUNCTION

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Treatment for male incontinence follows a full subjective and objective assessment to diagnose the problems and formulate a plan of action.

Assessment

The subjective assessment, which includes the surgical and medical history is followed by an objective examination, which includes a digital rectal examination to assess the strength and endurance of the anal sphincter and the puborectalis muscle. These muscles are graded 0-5 for muscle strength using the modified Oxford scale, for the duration of the hold and for the ability to perform fast contractions (Laycock, 1994)¹.

Patient education

Most men appreciate an explanation of their medical condition, with the help of a diagram and plastic model, and the treatment options available.

Pelvic floor muscle exercises

Pelvic floor exercises should be individually taught to make sure the patient is lifting up the pelvic floor and not bearing down as if defecating (i.e. performing a Valsalva manoeuvre). Men can be encouraged to tighten and lift the pelvic floor muscles as in the control of flatus or the prevention of urine flow and can practise in front of a mirror to observe a withdrawal of the penis and a scrotal lift. The convenient positions for practising pelvic floor muscle exercises are in supine lying with knees bent and the knees apart; standing with feet apart; and sitting with knees apart. The intensity of the contraction is more important than the frequency as maximum voluntary effort causes muscle hypertrophy and increased muscle strength². In order to achieve full fitness, pelvic floor muscle exercises should be taught for endurance as well as for muscle strength by sub-maximal contractions. Muscle training, therefore, depends on the motivation of the patient and the adherence to the pelvic floor exercise regimen. Treatment progression is patient specific and dependent on ongoing assessment. For muscle building, it is the quality not the quantity that is important. Home exercises can be practised as strongly as possible twice a day in crook lying, sitting and standing. The hold time in seconds is set individually by the therapist according to the number of seconds held during the digital rectal examination. The rest time should exceed the hold time to allow the muscle to recover from exertion.

Pre-prostatectomy pelvic floor muscle exercises

Pelvic floor muscle exercises should be taught prior to prostate surgery³.

Treatment for post-prostatectomy incontinence

Post-prostatectomy incontinence is treated according to the presenting symptoms. Following TURP and radical prostatectomy, patients may have stress incontinence due to damage to the internal urethral sphincter, or urge incontinence, or a combination of both types. Continence relies on a competent external urethral sphincter, reinforced by the pelvic floor musculature.

Treatment for stress incontinence

Patients can practise a specific pelvic floor muscle exercise programme when the catheter has been removed. The 'knack' of tightening at times of increased intra-abdominal pressure should be taught to cope with activities such as moving from sitting to standing, coughing, sneezing and lifting⁴. Manometric (pressure) or EMG biofeedback is a useful adjunct to pelvic floor muscle re-education to stimulate greater patient effort. Electrical stimulation may assist in showing patients how to initially contract the pelvic floor muscles though it is contra-indicated in patients with or after prostate cancer.

Treatment for urge incontinence

The filling symptoms of frequency, nocturia, urgency and urge incontinence can be treated with pelvic floor muscle exercises, behavioural training which include urge suppression techniques, and lifestyle changes which include the reduction of caffeine, alcohol and smoking. Pelvic floor muscle exercises can be used for urge incontinence to strengthen the pelvic floor musculature and regain the ability to control the urge to void urine. It is suggested that when the pelvic floor contracts the detrusor muscle relaxes due to the activity of the perineopudendal facilitative reflex⁵. Electrical stimulation is sometimes used in the treatment of detrusor instability to promote reflex inhibition of detrusor contractions.

Pelvic floor muscle exercises for post-micturition dribble

Pelvic floor muscle exercises may be taught for post-micturition dribble. They are more effective than bulbar massage⁶. A post-void 'Squeeze out' pelvic floor muscle contraction is an effective way of reducing or eliminating the after-dribble⁷.

Pelvic floor muscle exercises for erectile dysfunction

Lower urinary tract symptoms, especially frequency, urgency, urge incontinence and nocturia, are significantly associated with sexual dysfunction in men. Pelvic floor muscle exercises designed to improve incontinence may also help to restore erectile function. They should be considered a first-line treatment.

Treatment outcomes

Pelvic floor muscle exercises aim to achieve urinary control, continence, and confidence in conjunction with other conservative measures. However, it is not always possible to gain this outcome and patients may need help managing their condition. It is important to set realistic goals. Patients with long-term post-prostatectomy incontinence may choose to have an artificial urinary sphincter surgically implanted.

Conclusion

The current evidence suggests that pelvic floor muscle exercises are a realistic first-line conservative approach for the treatment of post-prostatectomy urinary incontinence. The same exercises may also help patients suffering from erectile dysfunction.

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PSYCHOSEXUAL ASPECTS OF MALE HYPERACTIVE PELVIC FLOOR DYSFUNCTIONS

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Based on a review of available scientific data and on clinical observations a theoretical framework for the pathogenesis of hyperactive pelvic floor disorders is conceptualized in defining the Hyperactive Pelvic Floor Syndrome.

Hypotheses

Hypotheses on the etiology of this syndrome with co-morbidity of symptoms concerning gastro-intestinal, urogenital and sexual functions are operationalized in a multifacettal, multidisciplinary approach of the complex symptomatology of patients with long histories of unsuccessful medical, surgical and psychiatric treatments. In general most treatments do not take into account the psycho-physiological aspects of muscle tension originating from psychological, psycho-social and/or psycho-sexual distress and resulting in physical symptoms that tend to be fixated in a vicious circle of pain, outlet obstruction, anxiety and muscle tension.

Pelvic floor hyperactivity

According to the literature co-morbidity of CPP, unexplained genital pain, bladder outlet obstruction, prostatodynia and sexual dysfunction in men is far from rare. Although somatization and altered pain perception play a certain role, most of these symptoms can be explained by the mechanical effects of constriction by the pelvic floor musculature of the different structures and by vascular and neurological changes, due to compression of blood vessels and/or entrapment of nerves. During sexual activity physiological pelvic floor contractions in men with a hyperactive pelvic floor may cause discomfort and impairment of the physical sexual response.

Traumatization

If pelvic floor hyperactivity is responsible for symptoms of obstruction, dysfunction and pain –and there is increasing evidence for this hypothesis- the main question in each individual case is what has been the initial cause for the pelvic floor to start functioning in a dysfunctional way. In the majority of cases the hyperactivity of the pelvic floor initially is related to experienced threat as a result of sexual, physical and or psychological traumatization. In a minority of cases no major threatening life-events can be identified. In these cases hyperactivity of the pelvic floor seems to be related to behavioral aspects (e.g. dysfunctional voiding behavior) or muscle overexertion.

Therapy

Therapy of the hyperactive pelvic floor syndrome in men should consist of medical interventions aimed at symptom relief, physical therapy and cognitive behavioral psycho-sexual therapy.