

**W15: What should you know about Male Urinary incontinence:
Total approach from Organization of a continence center, rehabilitation
to operation**

Workshop Chair: Ervin Kocjancic, United States

27 August 2013 09:00 - 12:00

Start	End	Topic	Speakers
09:00	09:15	Diagnosis and evaluation of male incontinence	<ul style="list-style-type: none"> • Enrico Finazzi Agro
09:15	09:30	What is and how should be organize a continence center	<ul style="list-style-type: none"> • John J. Smith
09:30	09:45	Physical therapy and behavioural modifications: expert opinion and evidence based medicine	<ul style="list-style-type: none"> • Heather Lynn Moky
09:45	10:00	What is the evidence for medical therapy	<ul style="list-style-type: none"> • Enrico Finazzi Agro
10:00	10:30	Artificial Urinary Sphincter and it's alternative	<ul style="list-style-type: none"> • Wilhelm Huebner
10:30	11:00	Break	None
11:00	11:15	Non-adjustable slings	<ul style="list-style-type: none"> • Ervin Kocjancic
11:15	11:30	Post operative Adjustable Options	<ul style="list-style-type: none"> • Wilhelm Huebner
11:30	11:55	Case presentation and trouble shooting	All
11:55	12:00	Q. and A.	<ul style="list-style-type: none"> • Ervin Kocjancic

Aims of course/workshop

The aim of the workshop is to give a comprehensive overview of the current aspects of male urinary incontinence in a multidisciplinary fashion. All the relevant health care providers: the continence advisor, physical therapists and urologists will discuss the current possible options for an optimal counselling and treatment of male urinary incontinence. At the end of the session the participants will be able to organize Patient support groups; familiarize with the most frequently performed physical therapy and other rehabilitation options; achieve the basic knowledge of different surgical options, management of difficult cases and complications.

Diagnosis and Evaluation of male incontinence

Enrico Finazzi Agro'

INTRODUCTION

Incontinence following prostatectomy is a devastating complication associated with significant alteration in quality of life. The incidence of urinary incontinence after radical retropubic prostatectomy ranges from 2.5% to 87%,¹ and tends to be lower in more recent series at 2% to 10%.² Incontinence has also been reported in 1% of patients undergoing surgical treatment for benign prostatic hyperplasia.¹ Approximately 10% of patients seek treatment for incontinence after radical prostatectomy.³ **Overall symptomatic post-prostatectomy incontinence after radical retropubic prostatectomy likely occurs in 2% to 15% of patients and less than 5% will require surgical treatment.**⁴ Occasionally incontinence can also occur after other forms of treatment for prostate cancer including cryotherapy, brachytherapy and even internal urethrotomy for anastomotic strictures. The risk is greater following transurethral prostatectomy performed after radiation or brachytherapy. Although the incidence of post-prostatectomy incontinence has decreased with better understanding of the neurovascular bundles and modification of the operative technique, it continues to be one of the most feared complications of surgery. A reason for the wide range in incidence rates is the use of different definitions of continence and methods of assessment.

PATIENT EVALUATION

The evaluation of patients with PPI should begin with a comprehensive history which should include the onset, duration, description of the type and severity of incontinence, and precipitating events. It is important to quantify the severity of leakage based on the number of pads used or pad weight. It is important to assess how the incontinence affects daily activities and whether it is bothersome. A history of adjuvant radiation increases the probability that detrusor overactivity or poor compliance may exist. A voiding diary can be helpful to get the exact quantification of the fluid intake and functional bladder capacity. *Physical examination.* Physical examination is performed with emphasis on the neurological evaluation assessing the S2-S4 spinal segments including anal sphincter tone, perineal sensation in S2-S4 segments and bulbocavernosus reflex. The abdominal examination is performed to detect a distended bladder with overflow incontinence.

Urodynamic evaluation. The main role of urodynamics is to differentiate the various causes of PPI and especially to rule out poor bladder compliance, high pressure detrusor overactivity during filling and any bladder obstruction during the pressure flow study. Urodynamic bladder capacity is also assessed as most patients with severe incontinence have low functional capacity because of poor storage. Patients with poor compliance are especially at higher risk for complications after artificial urinary sphincter implantation and should be treated with

anticholinergics before anti-incontinence procedures. The role of ALPP to predict the degree of urinary incontinence is unclear and studies have failed to show any correlation of ALPP with severity of sphincter damage. Walker et al prospectively evaluated 14 patients complaining of post-prostatectomy incontinence and found no correlation between ALPP pressure and severity of incontinence.⁵ *Cystoscopy*. Patients with obstructive symptoms should be evaluated with office cystoscopy before any surgical treatment to rule out anasto-**ABBREVIATIONS:** ALPP (abdominal leak point pressure), AUS (artificial urinary sphincter), BAMS (bone anchored male sling), PPI (post-prostatectomy incontinence), ProACT (prostate adjustable continence therapy)

Endoscopic evidence of urethral coaptation may indicate degree of sphincter insufficiency.

ORGANIZING AND MASTERING A MALE PELVIC HEALTH CENTER

John J. Smith III.

Did you know that one in five men will experience urinary incontinence in their lifetime? Many people are ashamed of their condition, or assume this is a natural result of aging. The recent explosion of robotic prostatectomy has not produced the functional outcomes as promised with regard to incontinence and erectile dysfunction. Moreover, a better understanding of anatomic dissection by our surgical colleagues has decreased the number of patients with bladder dysfunction post low anterior resection and abdominal-perineal resection but far from eliminated it. These are just two examples of groups of men who's quality of life suffers from pelvic floor disorders. We will discuss how to create a vision, which will allow you to facilitate the organization of a functioning successful male model pelvic floor center. We will discuss who the key players are and strategies to partner with them. Lastly, we all review the technical leadership of such an enterprise and how to manage it in a professional and successful manner.

Objective

To bring attention to an often over-looked yet vital component of access to care, improved outcomes and education of incontinent patients, namely Patient Groups. Highlighting key initiatives undertaken by The Canadian Continence Foundation as well as illustrating how such groups' benefit all stakeholders by increasing public awareness and thus improving access to treatment. Patient Groups also add value by lobbying policy makers to increase funding as well as providing an important patient and medical professional resource.

The participants will have greater insight into their role in Patient Advocacy and key principles and tactics in patient support for advocacy for access to new and better treatments

Physical therapy and behavioral modifications: expert opinion and evidence based medicine

By: Heather Moky PT, DPT

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Lecture Objectives

1. Identify areas of practice in pelvic floor physical therapy
2. Formulate special questions to be included in pelvic floor PT exams
3. Understand general proceedings for a pelvic floor examinations
4. Identify treatment options for incontinence
5. Identify behavioral modification for Incontinence.
6. Identify commonly used treatments in physical therapy.
7. Formulate exercise programs
8. Identify pelvic floor resources

I. Incontinence Statistics

A. General

1. World wide 200 Million people
2. 25 million Americans
3. Women vs Men 2 to 1
4. 17 % of men over the age of 60

B. Post radical retropubic prostatectomy- 8% to 56% of men have UI at 1 year after (Yamanishi et al)

C. Cost

1. Financial Cost : Over 19.5 Billion dollars a year in the U.S.
2. Emotional and Psychosocial costs as well.

II. Area's of Practice of Pelvic Floor Physical Therapy

A. Women

B. Men

1. Incontinence
2. Pelvic Pain
3. Erectile Dysfunction
4. Over Active Bladder
5. Benign Prostatic Hyperplasia- BPH
6. Post Surgical
7. Orthopedic Issues
8. Other

III. Pelvic Floor Evaluation

A. Patient History – Past medical and surgical history, present complaints

B. Outcome tools

1. International Prostate System Score
2. PFDI-20 Pelvic Floor Distress Inventory – short form 20
3. PISQ-12
4. Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire
5. PFIQ-7 Pelvic Floor Impact Questionnaire – short form 7
6. UDI-6 Urogenital Distress Inventory – short form 6
7. IIQ Incontinence Impact Questionnaire

C. Symptom Questionnaire

1. Urination
 - a. How often per day? Night?

- b. Urinary Leakage ?
 - How many times a day ?
 - How much?
 - Protection worn and how many needed a day
- c. Urinary Stream
 - Trouble initiating urine stream
 - Slow/ weak stream
 - Ability to stop the stream
- d. Ability to delay urination
 - How long?
 - Pain associated with holding urine?
- e. Night time toileting- frequency
- f. Triggers
 - Key in the door
 - Hearing water run

2. Bowel

- a. How often do you have a bowel movement?
- b. Consistency of bowel movement
- c. Bowel Leakage
 - How often
 - How much
 - Protection worn and how many needed a day
- d. Constipation and management techniques
- e. Ability to delay bowel movement

3. Sexual Function/ Dysfunction

- a. Frequency
- b. Pain
- c. Urinary or Bowel Leakage
- d. Ability to Climax
- e. History of Abuse

D. Education for the patient

1. Anatomy and Physiology

- a. Bony Pelvis/ Pelvic Girdle
 - Ilium, Ischium, Pubis. Sacrum, Coccyx
- b. Pelvic Floor Muscles
 - Pelvic floor muscles: muscular layer of the pelvic floor
 - Superficial- Urogenital Diaphragm/ Triangle
 - Bulbospongiosus, Ischiocavernosus, Superficial transverse perineal muscle
 - Deep- Levator Ani
 - **Pubococcygeus, Pubovaginalis, Puborectalis, Iliococcygeus**
- c. Sphincters
- d. Viscera
- e. Muscle attachments in and around the pelvis

2. Basics of Micturition

3. Basics of Defecation

E. Objective

- 1. Posture
- 2. Breathing
- 3. Gait
- 4. Lower Extremity Muscle Length and Strength
- 5. Range of Motion: Spine and Lower Extremities
- 6. Abdominal Strength, scars, and Diastasis Rectus Abdominis
- 7. Visceral Assessment

8. Special Tests
 9. Other
- F. External Pelvic Assessment
1. Visual inspection
 2. Skin Integrity
 3. Scars
 4. Perineal Body
 5. Reflexes
 6. Contraction
 7. Valsalva
 8. Palpation
- G. Internal Pelvic Assessment: Digital Rectal Exam
1. Muscle Tone
 2. Muscle Strength
 - a. Manual Muscle Test : Laycocks PERFect method
 - **Power:** strength using mod Oxford
 - **Endurance:** How long can pt hold contraction
 - **Repetitions;** How many times can pt perform
 - **Flicks:** Quick flicks, contract and relax in 10 sec
 - Result 4 number representation of pelvic floor strength, endurance and coordination
 - Strength on a 0 to 5 scale
 - Example 3/10/10/10
 3. Exam Contraindications/Precautions
 - a. Contraindications
 - Lack of patient consent
 - Active pelvic infection (vagina or bladder)
 - Active infectious lesions (genital herpes)
 - Absence of previous pelvic exam (pediatric)
 - Inadequate training on part of examiner
 - b. Precautions
 - Post Op vaginal/rectal surgery (6-8 weeks)
 - ◆ Surgeon clearance
 - Severe pelvic pain
 - History of sexual abuse
- H. Biofeedback
1. Rectal/ Vaginal Intracavity EMG
 2. External Pelvic Muscle EMG
 3. Real Time Ultra Sound
 - a. Pelvic floor Muscles
 - b. Sphincter
 - c. Abdominal Muscles
 - d. Multifidus
- I. Bowel and Bladder Diary – Diary of food, drink, leakage, pain, urge, and bathroom trips

IV. Physical Therapy Treatment

A. Behavioral

1. Bowel and Bladder Diary
2. Dietary Education
 - a. Proper hydration- 8 glasses of water a day
 - b. Proper Fiber intake and what foods have fiber in them
 - c. Bladder Irritants
 - Caffeine
 - Alcohol
 - Citrus

- Spicy Foods
 - Artificial Sweeteners
3. Delaying the Urge to Urinate
 - a) Urge Protocol- Contract and Relax the Pelvic Floor Muscles 5-6 times quickly. Then distract yourself. (Count backwards by 100 by 3's or sing a song)
 - b) Deep breathing
 - c) Retraining: Instead of "Mind over Matter" it is "Brain over Bladder"
 - d) Gradual exposure to triggers
 4. Timed Toileting
 5. Toileting posture/Voiding mechanics
 - a. Avoid Valsalva
 - b. Pulsed Lip exhalation
 - c. Better mechanics to assist relaxation of pelvic floor muscles
 6. Body Awareness- Taking note of what certain muscles are doing during different parts of the day- jaw clenched, butt tight, etc. Relax and Release
 7. Relaxation techniques

B. Postural Modifications

1. Teach patient proper posture
2. Important to stay in balance
3. Activate Muscles

C. Body Mechanics

1. Demonstrating proper body mechanics
 - a. Lifting, in and out of bed, etc.
 - b. Decreasing stress on other parts of your body to help avoid leakage
2. Pelvic Floor Muscle Activation – "The Knack"
 - a. Coughing
 - b. Laughing
 - c. Lifting
 - d. Sneezing – "Squeeze before you sneeze"
 - e. Transitions

D. Neuromuscular Re-education

1. Purpose
 - a. Re-educate muscles to perform correctly
 - b. Coordination
 - c. Contract/ Relax Properly
 - d. Down – training
 - e. Submaximal Contraction
2. Muscles
 - a. Pelvic Floor Muscles and Transverse Abdominis (Primarily)
 - b. Multifidus
3. Biofeedback
 - a. Real Time Ultra Sound (RTUS)
 - b. Surface EMG
 - c. Internal EMG with Rectal sensor
 - d. Other - Mirror

E. Manual work

1. Trigger point release
2. Myofascial release
3. Connective Tissue Work – adductors, abdominal, gluteals
4. Scar tissue mobilization
5. Visceral Mobilization

F. Stretching

1. Always treat what you find
2. Make sure to access both hamstrings and psoas

G. Strengthening-

1. Pelvic floor Strengthening
 - a. Visualize Pelvic Floor in mirror- anus tightening, penile movement
 - b. Improper contraction: compensation with adductors, gluteals or abdominal muscles
 - c. Progression: supine, side lying, sitting, standing, with movement, inverted
 - d. Long holds: working up to 10 second holds and Quick flicks
 - Allows for activation of both Type I and Type II muscle fibers
 - e. Coordination: steps or long holds with quick flicks
 - f. Muscle facilitation
2. Core strengthening
3. Address other weak areas in and around pt.'s pelvis
 - a. Gluteal muscles, Adductor muscles, Abductor muscles, and others that are found to be weak
 - b. Start basic and progress
- H. Mobilization- spine, hips, or other restrictions that are found
- I. Home Exercise Program
 1. Personal Responsibility
 2. 30 minutes of cardiovascular exercise on most days of the week
 3. Strengthening routine
 - a. Pelvic Floor strengthening
 - b. Core strengthening
 - c. Add in what else patient needs
 4. Stretching
 5. Behavior Modifications
 6. Home muscle strengthening- Use of tactile feedback
 - a. Insertion of fingertip into vagina or rectum
 - b. Sitting on rolled hand towel, or ball
 - c. Vaginal/ Rectal weights
 7. Basic Beginning Exercises
 - a. Adductor squeezes
 - b. Resisted Abduction with Theraband
 - c. Abdominal Activation
 - d. Sitting Piriformis Stretch
 - e. Posture and Body Mechanics
 - f. Pelvic Floor Muscle contractions if appropriate
 - g. Progress as appropriate and as tolerated
- J. Electrical Stimulation
 1. Home Unit
 2. Rectal sensor
 - a. Urge: 12.5 HZ
 - b. Stress: 50 HZ
- K. Others
 1. Supports
 - a. Sacroiliac joint braces
 - b. Abdominal Binders
 - c. Pressure garments
 - d. Others
 2. Tens
 3. Ultrasound
 4. Dilators
 5. Taping
 6. Penile Clamps
 - a. Talk with MD
 - b. Examples: J Clamp, C3 incontinence clamp, Cunningham Clamp, Gyrx Squeezer Klip, Greenwald
- L. Resources
 1. ICS www.icsoffice.org/

2. Australian Government Department of Health and Aging
<http://www.bladderbowel.gov.au>
Has incontinence handouts in many different languages
3. International Organization of Physical Therapists in Women's Health
www.ioptwh.org
4. Section on Women's Health of American Physical Therapy Association
www.womenshealthapta.org
5. Many other

Questions

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Workshop

What should you know about Male Urinary incontinence: Aspects of the problem and the Total approach

What is the evidence for medical therapy

Enrico Finazzi Agrò

Urinary incontinence is less commonly observed in male than in female patients and can be neurogenic, iatrogenic or idiopathic. The most common forms are stress, urgency and mixed incontinence.

Several drugs have been proposed for the treatment of stress urinary incontinence; alfa and beta adrenoceptor agonists; beta III adrenoceptor antagonists; serotonin-noradrenaline reuptake inhibitors.

Only sparse data of efficacy in male urinary stress incontinence are available for these drugs.

Urgency incontinence can be treated by antimuscarinic drugs, drugs acting on membrane channels (Calcium antagonists, K-Channel openers), drugs with mixed actions, antidepressants, alpha-adrenoceptor antagonists, Beta-adrenoceptor antagonists, Beta-adrenoceptor agonists, PDE-5 Inhibitors, COX-inhibitors, Toxins (botulinum toxin, capsaicin, resiniferatoxin). Only antimuscarinics, some drugs with mixed actions (such as oxybutynin and propiverine) and botulinum toxin have been recommended with a high level of recommendation (A) by the 4th International Consultation on Incontinence (ICI). Generally, data of efficacy of these drugs on male urinary incontinence are less common than data on female urinary incontinence.

The exact role of medical therapy in male patients has not been completely defined, except for some antimuscarinics and botulinum toxin in neurogenic patients. Further evidence is needed for all the remaining drugs and indications.

Is the Artificial Urinary Sphincter – AMS 800 the gold standard and alternative sphincters

W. Hübner

Introduction

The AMS 800 artificial urinary sphincter prosthesis has been used for more than 30 years. Physicians worldwide have implanted the device in about 100,000 men as a treatment for stress urinary incontinence due to prostatectomy, TURP, trauma or neurogenic reasons. The success rates of the AUS are still the highest compared to all other treatment options for male SUI.

The AMS 800 artificial sphincter - function

The AMS 800 is a hydraulic system which consists of three components: the cuff around the urethra, the pump positioned in the scrotum, and the pressure regulating reservoir balloon. The implant is made up from solid silicone elastomer, the system is filled with isotonic fluid. The system mimics normal sphincter function by opening and closing the cuff around the urethra voluntarily by the patient by pressing the pump. Thereby the fluid is transferred from the cuff to the reservoir and the cuff opens, allowing urine to pass. Within a few minutes after urinating, the fluid automatically will flow from the balloon back to the cuff, closing the urethra and providing continence.

Patient selection

The few contraindications for implanting an AMS 800 include patients with inadequate dexterity and/or mental acuity to use the pump, poor motivation to use the device, skin diseases in the implantation field and UTI.

Careful consideration of pros and cons will be needed in the following situations:

- Recurrent need for transurethral manipulations
- Recurrent strictures
- Urethral diverticulum
- Detrusor insufficiency
- Low capacity bladder (augmentation)
- Obstruction (BN incision/sphincterotomy/stents)
- Detrusor overactivity (Botox)

Implantation technique

Implantation of the AMS 800 usually takes 45 to 90 minutes. Following is a brief summary of the surgical procedure.

There are a number of possible surgical approaches for implanting the AMS 800. In the

following steps we outline both the transverse scrotal approach and the perineal approach.

Classic Perineal Approach

Incision and Dissection

Place a Foley catheter into urethra to help identify it during dissection. Make a midline perineal incision and bluntly dissect bulbocavernous muscle from around the bulbous urethra. Some surgeons prefer to leave the bulbocavernous muscle on the urethra, particularly when it is atrophic. Completely dissect the urethra off the cavernous bodies for about 2 cm. Injury to the cavernous body can be tolerated, urethral injury leads to abortion of the operation. Place cuff sizer around urethra where the cuff is to be implanted. It should fit snugly without constricting urethra. Note: If catheter or sound is in urethra, remove it before measuring the urethra. Do not stretch cuff sizer before use. Surgeon should use his or her judgment in choosing an appropriate cuff size, the measuring tape only provides approximate measurement of bulbous urethra circumference. The inside circumference of cuff is somewhat smaller than the outside circumference of cuff.

Place the Cuff

Select cuff size that corresponds to measured length. Prepare cuff for implantation. Position cuff around the urethra with the "pillow" side toward urethra. If preparation of the cuff (unpacking, removal of air, rinsing) will take a few minutes, placement of the pressure regulating balloon may be commenced meanwhile.

Place the Pressure Regulating Balloon

Select appropriate size pressure regulating balloon. Make a suprapubic incision, divide rectus fascia transversely, and use a spreading motion to separate the linea alba to reach prevesical space. Use blunt dissection to create a space for balloon. Position the balloon in prevesical space. Many surgeons prefer an intraperitoneal position for the balloon in order to ensure reliable constant pressure which may be influenced by extraperitoneal formation of pseudocapsules.

Place the Pump

Use blunt dissection to create a dependent subdartos pouch in the scrotum. Note: Control pump should be placed on same side as the pressure-regulating balloon. Place pump into scrotal pouch with deactivation button facing outward so that it is palpable. Route the tubing to abdominal incision. Note: The pump tubing should be above rectus muscle and fascia in abdominal incision.

Make Connections

AMS Suture-Tie Connectors or AMS Quick Connect Sutureless Window Connectors may be used to connect the tubing, today the latter are preferred in most institutions. Normally we use the straight connectors. Right angle connectors should always be used

when the tubing makes a sharp curve at the point of connection.

Deactivate and Close

To deactivate the device, squeeze and release the pump several times to empty the fluid from the cuff. When the pump is refilled so there is a slight dimple in it, push the button to lock the cuff open during the healing process. It is important to leave a slight indentation in the pump bulb to ensure that there is enough fluid in the pump to activate the device later. Close the incision.

Transverse Scrotal Approach¹⁰

Incision

Make an upper transverse scrotal incision through the subcutaneous tissue. Move the incision up the penis and stabilize with a surgical retractor and blunt stay hooks at 1, 3, 5, 7, 9 and 11 o'clock.

Expose the Tunica Albuginea

Sharply expose the tunica albuginea of both corpora cavernosa. Pass the Metzenbaum scissors proximally along the ventral surface of the tunica to the proximal corpora. When deep exposure of the proximal corpora is secured, place an intact Deaver retractor on the side of the urethra for caudal traction. Repeat on the contralateral side, exposing the scrotal septum.

Dissection

Sharply dissect the scrotal septum off the bulbar urethra. To mobilize the urethra, sharply dissect the webs of Buck's fascia binding the diverging corpora cavernosum to the corpora spongiosum.

Dissect and Measure Urethra- Place the Cuff

Because the patient is in the supine position, the urethra is mobile. Use a right angle clamp to conduct the posterior dissection of the urethra almost under direct vision. Spread the right angle clamp to create sufficient space for the placement of the occlusive cuff. Measure the urethra. Then place the proper size cuff around the circumference of the urethra.

Place the Pressure-Regulating Balloon

There are two ways to place the pressure-regulating balloon (PRB):

- With the bladder empty and the surgical retractor and stays removed, retract the tissue to the side of the penis. Place the PRB in the retropubic space by locating the inguinal ring and sharply piercing the transversalis fascia. After the PRB implantation, narrow the opening with an absorbable suture.

- Alternatively, displace the scrotal incision over the inguinal area and inguinal ring location. Finger dissection is used to develop a pouch beneath the rectus but anterior to the transversalis fascia (cephalad to the inguinal ring). This avoids the necessity of piercing the fascia in patients with scarred retroperitoneum after the PRB is implanted. Narrow the opening with an absorbable suture. Balloon tubing is rooted superficially to the control pump.

Place the Pump

Elevate the inferior aspect of the scrotal incision. Develop a space underneath the scrotal skin and dartos muscle to serve as a pouch for the pump. Begin the development of the tunnel about 2 cm from the skin edge in order to facilitate eventual tubing and connector concealment. Loosely tie purse string suture around the opening of the tunnel to secure the pump position.

Finally Trim Tubing and Make Connections and deactivate the system as described above, then close the incision.

Non Adjustable Slings
Ervin Kocjancic

Bone Anchored Male Sling

Technique: It utilizes six 5 mm. titanium screws which are drilled into the antero medial aspects of each descending pubic rami using the InVance bone drill (American Medical Systems). These screws are preloaded with a pair of number 1 polypropylene sutures. The proximal or the top most bone screws are placed just beneath the junction of descending ramus and pubic symphysis and the remaining suture are placed a centimeter apart on each side. A 4 x 7cm. polypropylene mesh alone or in combination with dermis as a composite graft are used as a sling material. The urethral dissection is not performed. The sutures are transferred through the one side of the graft. After, one side of sling is anchored to the pubic ramus, sling tension is adjusted, either by retro grade urethral pressure method or if the patient is awake, by simple cough method. Sling is then tied down to the opposite pubic ramus with adequate tension. If cough method is used the procedure should be done under spinal anesthesia.

Outcomes: Optimal cure rates have been reported with the bone anchored perineal sling and generally range from 70% to 90% depending on the method of evaluation and definition of success^{1,2}

In a study of 46 men at a mean follow up of 18 months, the procedure was found to be successful in 76% and improved in another 35%. 24% of patients failed the procedure and all the failures were found to be due to absorbable graft material. The success rates were significantly greater in patients receiving synthetic mesh, either alone or as composite graft compared with the use of absorbable material alone (75% and 97% versus 0% respectively, p value < 0.05)². It was also found that the patient with mild to moderate incontinence (less than five pads) had a significant better outcome compared with those with severe incontinence, (five or more pads). The sling failure correlated well with the type of material and severity of the incontinence. **Since the introduction of this procedure, it is now established that this procedure is suited for mild to moderate incontinence only.**

On comparing male sling with collagen injection, the authors have found male sling to be more effective than the collagen implant in the treatment of mild to moderate incontinence, 76% versus 30% respectively. Mean number of collagen injections were found to be 2.1 with a range of 1-5 with a mean of 8.8cc (2 to 34cc) collagen was injected in 34 patients and another 37 patients received the perineal bone anchored male sling. There was a statistical significant difference between the two groups, (p < 0.05)⁴.

In another study, comparing the bone anchored male sling with artificial urinary sphincter, at a mean follow up of 22 months, male sling provided comparable efficacy in mild to moderate incontinence as compared to artificial urinary sphincter (90% versus 80% respectively). On the other hand, artificial urinary sphincter was much more superior in patients with severe incontinence, 72% versus 58% respectively⁵. It was concluded that patients with mild to moderate incontinence can be counseled to have equally effective outcomes undergoing male sling as well as artificial urinary sphincter.

The author believes that the partial compression on the ventral aspect of urethra by male sling is adequate for continence in patients with mild to moderate incontinence as they have an adequate sphincter function but in patients with severe incontinence, who have severe damage to their

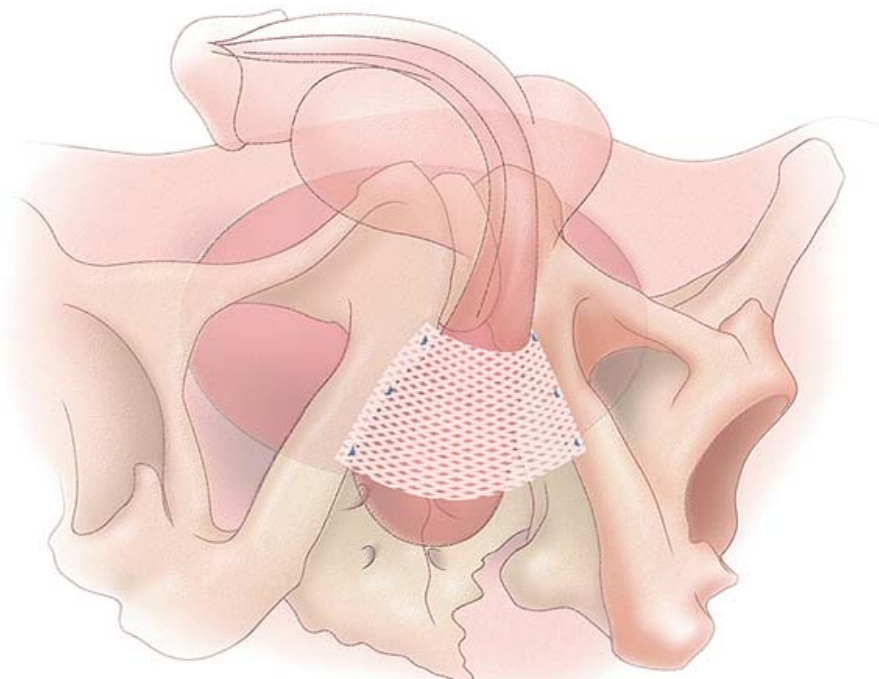
sphincter mechanism, it requires circumferential compression by artificial urinary sphincter (**Fig 2**).

Another advantage of male sling would be that it does not preclude artificial urinary sphincter implantation at a later date. This observation was obtained from another study looking at feasibility of artificial urinary sphincter after the failure of male sling surgery. A total of 18 patients failed the procedure at a mean follow up of 13 months. Of these, 11 patients proceeded to undergo artificial urinary sphincter placement. No complication was encountered during urethral dissection in patients who had prior male sling procedures. A dry rate of 72.7% was found following AUS implantation. And another 9.1% improved in their incontinence. Mean follow up after salvage artificial urinary sphincter was 14.2 months with a range of 6 to 20 months. Patient satisfaction after artificial urinary sphincter placement was 74.5%. It was concluded that artificial urinary sphincter placement after a failed bone anchored male sling is technically feasible and does not affect the short term efficacy of artificial sphincter ⁶. These results were found to be comparable with naïve AUS placement.

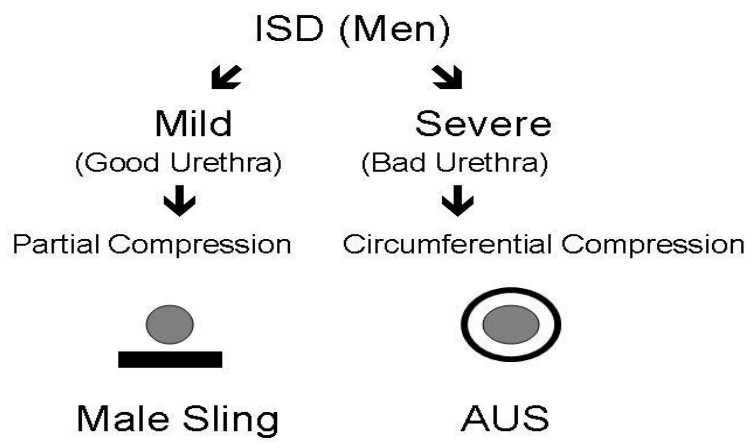
With regard to other outcomes, the infection and erosion for perineal sling is low (2.1%) and the need for revision caused by bone anchor dislodgement is 4.2% ³. Transient urinary retention is seen in 2% of cases. Prolonged perineal pain or discomfort occurred in 15% which usually resolves within 3-6 months.

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Which Procedure To DO?



Adjustable systems for treatment of male incontinence

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Surgical therapy of male incontinence follows different strategies compared to female incontinence. The vast majority of cases will need therapy for incontinence that was caused by surgical procedures, mainly radical prostatectomies. Due to that etiology clinical findings are also different than in the female. Most patients will be able to interrupt their stream even if they leak heavily. Additionally you will find the leakage to increase in the afternoon in the most cases. This is the clinical impact of an impaired striated muscle function (innervated by the pudendal nerve). However, the striated muscle is not capable of a long term contraction, which finally results in the clinical sign of incontinence due to fatigue.

It is well understood, that during radical prostatectomy the structures compromised usually include the autonomous innervation of the smooth muscle of the sphincter system. Therefore our goal must be to support this smooth muscle function.

Adjustable male slings

Adjustable male slings are supposed to reestablish the baseline continence provided by the smooth muscle system. It is the goal to support this function by a minimal increase of the urethral resistance (10-15cmH₂O). Adjustable male slings (Argus, Reemex) support the bulbar urethra thereby also using the bulbar venous tissue as a continence factor. Both systems (Argus, Reemex) are placed under the bulbar urethra and passed through the retropubic space up to the suprapubic region, where it is fixed. The argus-sling may as well be fixed using a transobturator approach. Anytime after placement of the sling the tension under the urethra maybe adjusted.

Surgical technique

A 10 cm longitudinale perineal incision is carried out after placement of a foley catheter. The subcutaneous tissue ist divided and the bulbo-spongiosus muscle is prepared. With the intact muscle covering the bulbar urethra the crura are freed on both sides of the bulbo-cavernosus muscle to show a triangular space between crus and muscle. Now a horizontal incision is made just above the symphysis and the rectus fascia is freed bilaterally approximately 3 cm off the midline. Now the implantation needle is placed in the triangle between crus and bulbo-spongiosus muscle, protecting the urethra with the tip of an index finger. The needle ist passed through the pelvic floor and in direct and permanent contact with the pubic bone and finally brought up to the suprapubic incision. The sling is then attached to the needle and finally pulled up to the suprapubic region. This procedures ist done bilaterally.

For the Argus „T“ a helical needle can be used, which is introduced in an outside-in fashion in the typical transobturator manner.

Intraoperative adjustment

For the **argus male sling** we recommand intraoperative adjustment using a retrograde LPP. Therefore a rigid cystoscope with obturator is placed in the mid urethra. An infusion bottle is connected to the cystoscope. The assistant is asked to slowly move the infusion bottle

downward until the infusion-flow stops. The upper fluid-level in the infusion bottle is measured against the level of the symphysis with a meterstick, it represents the retrograde leak point pressure (RLPP). This RLPP is taken before placement of the sling (usually 15 – 25 cmH₂O) and after placement of the sling. The sling should be adjusted to a RLPP of 25-35cmH₂O depending on the preoperative degree of incontinence. The sling is then fixed with the provided washer.

The **reemex system** works a slightly different. The suture, that has been brought up to the suprapubic incision will be connected to a so called „varitensor“. The varitensor consists of a mechanic system involving a cable winch, that can be adjusted using a little screw driver. This screw driver is left in place at the time of surgery sticking out of the wound. On day 1 after the operation the patient will be asked to void and cough. The sling is adjusted using the screw driver until the patient becomes dry, but still is able to void. Then the screw driver is removed and the wound is definitively closed.

Assessment

Sousa et al reported of 51 Remeex patients with the follow up of 32 month. 48 % were found to be dry, 26 % improved, 16 % not improved. Explantation had to be carried out in 6 % of cases.

Viktor Romano and co-workers published 48 patients using the Argus system with a follow up of up to 18 months and found 73 % to be dry, 10 % improved, 17% showed no improvement. In 10 % the sling had to be removed. Recently the first serious of argus T was presented at the EAU meeting in Stockholm with similar results, however so far only with short follow up. Our own series of 66 Argus patients and a follow up of up to 31 month in a highly selected group of patients with 84,8 % being treated previously to argus-implantation showed 89,4 % to be dry or improved, the others had to be explanted. About one third of patients will need adjustment in the first postoperative year to maintain continence.

In conclusion it can be stated, that with adjustable slings the dry-rate remains stable over a longer follow up, about 10 % of implants will have to be removed. The number of intermediate results is small.

In our series success the dry rates showed no correlation between preoperative pad rate or irradiation therapy, the dry rates were similar after short and intermediate follow up. The postoperative adjustability allows reaction on dynamic changes in the postoperative course, both on possibly changing livestyle of the patient ore changing urodynamic parameters.

Adjustable male slings represent a convincing concept, wide indication and excellent outcomes in the treatment of male incontinence.

Pro – Act

The first Pro - Act device was implanted in 1999 in the Korneuburg Hospital in Austria.

The system involves two silicone balloons which are placed bilaterally above the pelvic floor using a perineal approach. Special instruments (trocar, tissue expansion device) are used for placement, fluoroscopy or transrectal ultrasound is applied for exact positioning. And the end of the procedure the balloons basically are in the position where the prostate used to be. The whole surgery usually takes 15 to 20 minutes.

A major advantage of the Pro Act System is the easy adjustment at any time after the operation. In fact, the Pro Act system was the first widely used continence prosthesis, that

offered postoperative adjustability. Continence is provided by a minimal increase of the urethral resistance, thus supporting the smooth muscle function of the sphincter mechanism.

The first larger series of 117 patients was published in the European Journal of Urology 2005 by Hübner et al. The average age of this group was 68 a, follow-up was 13 months (3-53mts). The population included patients with mild, moderate and severe incontinence, with the latter group being the largest. Postoperatively 52% of patients were dry, 22 improved, the average pad use was reduced from 5 to 1 pad. The re-operation rate was 18% including the learning- and development rate. It should be noted, that the dry /improved rate what's similar in all groups showing now correlations to the preparative degree in continence. However, the results are less favourably in patients after endoscopic manipulation of the urethra such as urethrotomy or bladder neck incisions, which may lead to the development of scar tissue. Pro-Act should not be used in irradiated patients due to a high erosion rate in this particular patient group.

Pro-Act can be considered an absolute minimally invasive procedure that has stood the test of time and will remain as a treatment option in the field of male incontinence. However, above, correct indication as well as expertise in the implantation technique are necessary to achieve good results.

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