

Opinions and evidence on management of pelvic organ prolapse. Review and consensus statement (POP Working Group)

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Abstract: Pelvic organ prolapse is a global health concern affecting adult women of all ages. POP can be defined as a downward descent of female pelvic organs, including the bladder, uterus, post-hysterectomy vaginal cuff and the small or large bowel, resulting in protrusion of the vagina, uterus, or both. Its development is multifactorial, with vaginal childbirth, advancing age, and increasing body-mass index as the most consistent risk factors. Vaginal delivery, hysterectomy, chronic straining, normal ageing, and abnormalities of connective tissue or connective-tissue repair predispose some women to disruption, stretching, or dysfunction of the levator ani complex, connective-tissue attachments of the vagina, or both, resulting in prolapse. Patients generally present with several complaints, including bladder, bowel, and pelvic symptoms. No guidelines exist regarding the management and treatment of these disorders. This paper is a reduced version of the original Consensus Statement of an Italian POP Working Group whose intention was to give guidance and support for the approaches to problems of the pelvic floor, to suggest recognized guidelines and to stimulate further studies of the topic. *Contents:* 1) Male/female pelvic anatomy; 2) Pelvic Organ Prolapse (POP): Literature update; 3) The Integral Theory; 4) POP and faecal incontinence; 5) POP and obstructed defecation; 6) How to evaluate POP; 7) The role of imaging; 8) The minimum/correct work-up for POP evaluation; 9) The urogynecological view; 10) The role of conservative treatment; 11) The surgeon role in front of POP; 12) Sacrocolpopexy and rectopexy; 13) The pexies are the gold standard for any POP repair? 14) POP repair after the FDA warning; 15) The shrinkage/erosion of implanted material: complications evaluation and management.

Keywords: Pelvic organ prolapse; Incontinence; Obstructed defecation; Mesh, Integral Theory; TFS.

1. MALE/FEMALE PELVIC ANATOMY

(Updates & limits of our knowledge)

The Pelvic Floor is composed of organs, muscle, fascia and ligaments, interconnected with each other and the bony pelvis by an extensive fibro-elastic network containing virtual anatomical spaces.¹ The pelvic floor is composed of levator ani, coccygeus muscles with their fascia, perineal membrane, superficial perineal muscles, deep perineal muscles and perineal body.

Three kinds of fascia can be described: visceral, parietal and endo-pelvic which is attached to the tendinous arcs at the pelvic side wall. The levator ani muscles ileococcygeous, pubo-rectalis and pubo-coccygeous (further divided in pubo-perinealis, pubo-vaginalis, and the pubo-analis) (Table 1)^{2,3} are composed mostly of type I striated muscle fibers. [Level of Evidence [LE] 2A, Grade of Recommendation [GR] B]. The perineal membrane is a triangular-shaped fibro-muscular structure, attached to the pubic bones anteriorly.^{4,5} The deep and superficial transverse perinei have a supporting function, bulbo-spongiosus and ischio-cavernosus muscles sexual functions. The arcus tendineus levator ani and the arcus tendineus fascia pelvis attach muscles to the pelvic side wall.

Central and peripheral nervous systems regulate all functions.⁶ [LE 1B, GR A]. The peripheral nervous system supplies the pelvic floor with:

- branches of the sacral plexus: the pudendal nerve (coursing inferior to the pelvic floor)
- levator ani nerve (coursing superior to the pelvic floor)
- parasympathetic pelvic splanchnic nerves (nervi erigentes)
- hypogastric nerve (sympathetic).¹

2. PELVIC ORGAN PROLAPSE (POP): LITERATURE UPDATE (last 10 years)

Vaginal delivery poses the strongest risk factor for POP.⁷ Abnormalities of connective tissue predispose to pelvic organ prolapse (POP); excess straining is thought may cause pudendal nerve neuropathy,⁸ associated with POP.⁹

Increased MMP-1 immunohistochemical expression in utero-sacral ligaments is associated with urogenital prolapse.¹⁰ Elastin metabolism studies suggest increased degradation but also abnormal synthesis in woman with POP.¹¹

High-risk pedigrees and linkage analysis showed evidence for significant genome-wide linkage on several chromosomes.^{12,13}

3. THE INTEGRAL THEORY: A MUSCULO-ELASTIC THEORY OF PELVIC FLOOR FUNCTION AND DYSFUNCTION

In according with Petros,^{14,15} POP and its symptoms such as urinary stress, urge, abnormal bowel, bladder emptying, some forms of pelvic pain and fecal incontinence are caused by laxity in the vagina or its supporting ligaments, a result of altered connective tissue. The main etiologies were childbirth related laxity compounded by ageing. The vagina is suspended like a suspension bridge, with the ligaments above and the muscles below (Fig. 1). The muscle forces (arrows) contract against the suspensory ligaments to give the bridge form and strength. Because the ligaments and vagina are the ultimate supports of the bladder and rectum (Fig. 1-2) anything which damages these structures can also affect the structure and function of bladder and rectum.

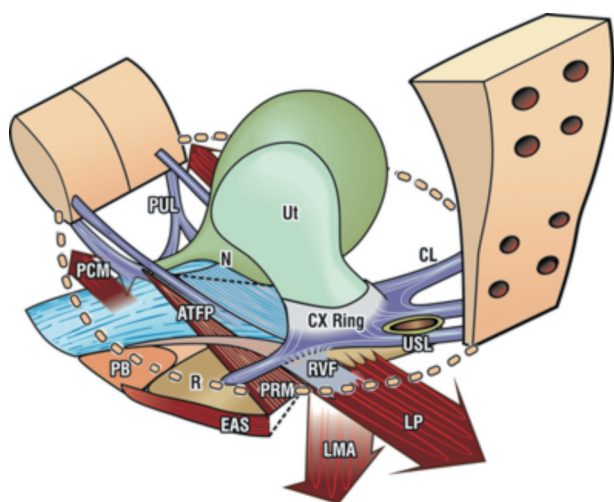


Figure 1. – Integral Theory. View of pelvis from above and behind. Arrows: muscle forces.

Ligaments: ATFP= arcus tendineus fascia pelvis; CL=cardinal ligament; USL=uterosacral ligament; PUL=pubourethral ligament; PB=perineal body; LP= levator plate; LMA=longitudinal muscle of anus; PCM=anterior pubococcygeus muscle; PRM= puborectal muscle; Circular broken lines = pelvic brim.

Moreover, uterine prolapse can be caused by the elongated of cardinal ligament and of utero-sacral ligament. While cystocele can be the result of failed tension of cardinal ligament and arcus tendineus fascia pelvis support. Failed utero-sacral ligament may cause ‘posterior fornix syndrome’ (urgency, pelvic pain, nocturia, evacuation disorders). Failed perineal body can cause rectocele and manually assisted defecation and can contribute to Descending Perineal Syndrome.

4. POP AND FAECAL INCONTINENCE

7-31% of women with POP have faecal incontinence (FI).^{8,16} Pathophysiology of POP and FI is vaginal delivery, advancing age, increased body-mass index, hysterectomy, chronic straining, normal ageing, abnormalities of connective tissue, connective-tissue repair.⁸ [LE 5, GR C].

FI and POP share common risk factors¹⁷ [LE 2, GR C]. 2.1% of women with descending perineum have some sign of genital descent with significant correlation between the Jorge incontinence score and degree of genital relaxation (r_s 0.85, $P < 0.001$)¹⁸ [LE 3, GR C]. 50% of patients with rectal prolapse also experience FI¹⁹ and 38% have POP.

5. POP AND OBSTRUCTED DEFECATION

18-25% of women with POP report obstructed defecation (OD)²⁰⁻²¹ and 32% of women with OD have POP.²² The pathophysiological mechanisms of OD-POP are unknown²³ [LE 1, GR A]. The crux of the matter can be defined with the following questions:

1. Does posterior vaginal compartment anatomy correlate with ano-rectal function?
2. Does restoring the anatomy of the posterior vaginal compartment improve defecatory function?
3. What is the best surgical approach to restoration of posterior vaginal compartment anatomy and defecatory function?

Other than those proposed by the Integral Theory, there are no answers to these three questions. [LE 3, GR C].

Breaks of the recto-vaginal septum cause high rectocele.²⁴ Derangement of uterosacral ligaments starts recto-

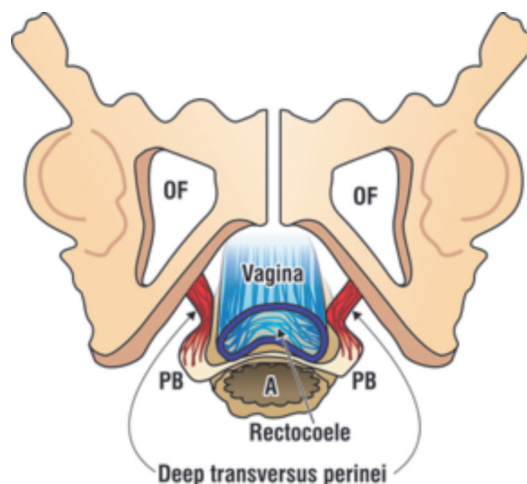


Figure 2. – Pathogenesis of rectocele. Perineal body (PB) components including deep transverse perineal muscles (DTP) are stretched laterally. The anus (A) and rectum protrude into the vagina. OF=obturator fossa. *Surgery*: TFS tape penetrates DTP and approximates the separated PB entities to form a neo central tendon to reduce rectocele and descending perineal syndrome.

rectal intussusception.²⁵ Other than the proposals of the Integral Theory, the role of POP, rectal intussusception and pelvic floor dyssynergia in inducing OD is not known, so it is impossible to suggest the best surgical approach for correction of OD/POP.

6. HOW TO EVALUATE PELVIC ORGAN PROLAPSE

There is no universally accepted anamnestic-clinical method for evaluating POP. The ICS includes urogenital and rectal prolapses²⁶ others the genitalia.¹⁶ Useful validated questionnaires for QOL are the Australian Pelvic Floor Questionnaire.²⁷ [LE 1, GR B]. The Pelvic Floor Impact Questionnaire (PFIQ-7),²⁸ Pelvic Floor Distress Inventory (PFDI-20)²⁸ and Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12)²⁹ [LE 1, GR B] and a novel software scoring program³⁰ [LE 1, GR B].

The POP-Q system attempts to overcome perceived deficiencies of the Baden and Walker halfway system.³² However the POP-Q itself has been questioned recently, in that it is complex, not easy to administer or teach and not useful for detection of recto-anal intussusception or rectal prolapse.

7. THE ROLE OF IMAGING

Different types of imaging are used in according with the pelvic floor’s dysfunctions.

Pelvic floor imaging is based essentially on:

- Ultrasound evaluation (US)
- Fluoroscopy (voiding cystourethrography, defecography, cystoproctography cystocolpodefecography)
- Pelvic floor MRI.

The most diffuse imaging modality of pelvic floor is ultrasound:³³⁻³⁷

- Transperineal ultrasonography (TPUS-called also translabial ultrasound or perineal ultrasound’)
- Transvaginal ultrasonography (TVS)
- Endoanal ultrasonography (EAUS).

With TPUS and TVS it is possible to diagnose¹ levator ani damage, avulsion defects, abnormal levator ani contractility and enlarged levator hiatus (ballooning), urethral mo-

bility, urethral vascularity, funneling, bladder neck descent, bladder wall thickness. EAUS is the gold standard to assess anal sphincter integrity.

Fluoroscopy assessments are:³⁸ voiding cystourethrography (VCUG), with or without urodynamic testing; evacuation proctography; cystoproctography and cystocolpoproctography.

With the VCUG it is possible to study bladder: position (e.g. Cystocele), relation to the pubic symphysis, mobility, diverticula and fistulas.

Evacuation proctography is indicated for suspicion of rectal intussusception, rectal prolapse, rectocele or pelvic dyssynergia.

MRI³⁸ is non invasive with no ionizing radiation. Its disadvantages are high cost, need for specialist radiological interpretation, absence of seated position.

In our opinion, US remain the diagnostic procedure of choice to study any POP dysfunction because it is minimally invasive, cost-effective and gives rapid diagnosis.

8. THE MINIMUM/CORRECT WORK-UP FOR POP EVALUATION

The first step of a diagnostic workup is a detailed history. Physical examination, while important, is quite poor for identification of many common pelvic floor problems.³⁹

Also useful are scoring systems, imaging (endoanal US dynamic cystocolpoproctography (DCP), dynamic MRI), functional testing (ano-rectal manometry, pudendal nerve terminal motor latency testing and anorectal electromyography).

Scoring Systems: Clinical practice relies scores and questionnaires: Australian Pelvic Floor Questionnaire, Pelvic organ prolapse quantification POP-Q, Baden Walker halfway assessment (still in general clinical use), Pelvic Floor Impact Questionnaire (PFIQ-7), Pelvic Floor Distress Inventory (PFDI-20), Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12), Integral Theory System Questionnaire (ITSQ) and the Three Axial Perineal Evaluation (TAPE) score.

The imaging assessment: increasingly is based on ultrasound. Since defecatory disorders are associated with POP, defecography evaluation is extended by opacifying the small bowel, vagina, and the urinary bladder.⁴⁰

Functional tests: are anorectal manometry, pudendal nerve terminal motor latency testing (PNTMLT) and electromyography.

9. THE UROGYNECOLOGICAL VIEW: THE PARTICULAR POINT OF VIEW IN FRONT OF MAIN PROBLEM

Symptoms linked to the bladder storage are USI, frequency, nocturia, urgency, emptying problems. Other symptoms are dyspareunia, vaginal laxity, vaginal bulging pelvic pressure, splinting/digitation, pain, acute or chronic, bladder, urethral pain, vulva or vaginal pain, pelvic or perineal or pudendal pain.

What are the signs to search during the examination of a patients with symptoms of urogynecologic clinical practice? The first steps history taking and clinical evaluation;⁴²⁻⁴⁴ examining with a full bladder for urine on coughing (stress incontinence), a cotton swab test for bladder neck hypermobility.⁴⁵ Vaginal examination seeks anomalies of vulva (e.g. cysts, infections, tumors, atrophic changes), urethra (e.g. mucosal prolapse, urethral caruncle and diverticulum), vagina (length, mobility, scarring), pain, and estrogenization, scars (e.g. perianal, peri-vulval), muscle function

(normal active, overactive, underactive and non-functioning), pubovesical muscle or avulsion injury, perineal descent during the valsalva the perineum shows a downward movement, low anal canal resting tone, inward scar or fistula within the vagina, rectocele and rectal intussusception. The examination must be conducted in any position which better displays the prolapse.

In POP-Q staging, the hymen is the fixed point of reference for prolapse: anterior vaginal wall, uterus (cervix), apex of vagina (vaginal vault or cuff scar after hysterectomy), posterior vaginal wall.³¹

- Stage 0: No prolapse is demonstrated
- Stage I: Most distal portion of the prolapse is more than 1 cm above the level of the hymen
- Stage II: Most distal portion of the prolapse is 1 cm or less proximal to or distal to the plane of the hymen
- Stage III: The most distal portion of the prolapse is more than 1 cm below the plane of the hymen
- Stage IV: Complete eversion of the total length of the lower genital tract is demonstrated.

What kind of investigations are usually used in clinical practice of urogynecologic patients? Other than the Integral Theory System Questionnaire (ITSQ), there is no evidence that the use of questionnaires has any impact on treatment outcomes [LE 3, GR B]. Voiding diaries assist symptom quantification [LE 3-GR B]. There is a poor correlation between UI symptoms and urodynamic findings.

The most diffuse imaging modality is ultrasound.³³⁻³⁶ Fluoroscopy has indications³⁸ as does dynamic-MRI.

What are the most common diseases in urogynecological clinical practice? At first evaluation, these are USI (72%), POP (61%), detrusor overactivity (13%-40%), bladder oversensitivity (10-13%) and voiding dysfunctions.

10. THE ROLE OF CONSERVATIVE TREATMENT

Women are not aware of prolapse until their bulge extends beyond their introitus.⁴⁶ Initial management is conservative⁴⁷ pessary and pelvic floor muscle exercises⁴⁸ typically for patients > 65 years 49-50 [LE 1, GR A]. With pessaries patients experiences significant improvement (P=0.045, Wilcoxon signed rank test) [LE 5, GR C]. There is little empirical evidence available regarding PFR effectiveness.⁵¹ Many patients abandon their exercise regimen over time.^{52,53} PFMT effects on urinary and fecal incontinence is different because the long-term success rate is well defined in both diseases (67%⁵⁴ and 53%⁵⁵ respectively). PFR is recommended as the first-line treatment for stress, urge, or mixed incontinence in women of all ages.⁵⁶ Rehabilitative treatment may be considered a first-line option for patients with faecal incontinence not responding to dietary modification or medication.⁵⁷ OD treated by conservative/rehabilitative treatment can result in long-term success rate of 50% [LE 1, GR A].^{58,59,60}

11. THE SURGEON'S ROLE IN TREATMENT OF POP

Surgery for POP can be approached vaginally, abdominally, laparoscopically, robotically.^{61,62} anterior colporrhaphy, with or without synthetic graft; vaginal hysterectomy with uterosacral; posterior native tissue colporrhaphy; post-hysterectomy apical prolapse with abdominal sacrocolpopexy. Anterior native tissue colporrhaphy has recurrence rates, up to 50%. Current evidence does not clearly support this approach to anterior compartment repair.⁶³⁻⁶⁷

The graft material most commonly in use for cystocele repair is polypropylene mesh, Amid Type 1.^{68,69} The poste-

rior compartment is more successfully repaired with native tissue colporrhaphy with 80% cure rates. Mesh in the posterior compartment is not supported by current evidence.⁷⁰⁻⁷² Apical prolapse rarely occurs in isolation; repair is often combined one or both other compartments.

Transvaginal uterosacral ligament suspension can be performed either as an intra-peritoneal or extra-peritoneal vaginal procedure. A meta-analysis of transvaginal uterosacral ligament suspension reported successful apical outcome in 98%, median follow-up of 25 months.⁷³ Ureteric injury/kinking, was reported in 11%.⁷⁴⁻⁷⁶ Success for the vaginal cuff is reported at 95% at 2 years.⁷⁷ The McCall culdoplasty anchors the distal uterosacral ligament pedicles to the vaginal vault.⁷⁸

Sacrospinous ligament vault suspension inserts sutures into the sacrospinous ligament.^{79,80} The Manchester repair is another option. The Gynecare Prolift reported 1 year success rates between 82 and 86%.⁸¹ Colpocleisis is an obliterative vaginal prolapse procedure performed with an aggressive perineorrhaphy.⁸² Abdominal sacrocolpopexy can be performed open, laparoscopically or with the aid of a robotic device. This approach maintains adequate vaginal length and sexual function. Reported success rates for all compartments are 78–100%, with mesh exposure in 3.4%.^{83,84} Short-term results are encouraging with 88% success at 1 year, but no long-term data regarding durability are available.

12. SACROCOLPOPEXY AND RECTOPEXY

Sacrocolpopexy is considered the choice of treatment for [LE 2a, GR B].⁸⁵⁻⁸⁷

- apical compartment disorders in associations or not with others concomitant defects as rectocele, enterocele or complete rectal prolapse;
- apical defects in young woman and patient who wish to remain sexually active.

Sacrocolpopexy use synthetic mesh or biologic mesh as xenografts (porcine dermis or bovine tissues) and allografts (cadaveric fascia) meshes to correct apical and/or advanced anterior wall prolapse.¹¹³

Recurrence rates of abdominal sacrocolpopexy (ASP) range from 0% to 22%.^{85,86} [LE 2a, GR B]. When compared to sacrospinous ligament fixation (SSLF) and uterosacral ligament suspension (USLS), ASP has greater durability, lower rate of recurrence of vault prolapse and less dyspareunia compared with vaginal sacrospinous colpopexy⁷¹ [LE 1a, GR A].

Xenograft mesh has greater probability of operation failure than polypropylene mesh [LE 1b, GR A].⁸⁸ Polypropylene mesh has an erosion risk that ranges from 3.4% to 10.5% after ASP; polyester mesh use has an increased risk of mesh erosion [LE 1b, GR A].⁸⁹

Laparoscopic and robotic assisted rectopexy have lower blood loss quicker recovery, less pain and shorter hospital stay [LE 1a, GR A].

Robotic Sacrocolpopexy has a longer operation time and is more expensive.⁷¹ The last review of Cochrane comparing laparoscopic sacral-colpopexy with open and robotic techniques showed no decisive outcomes⁷¹ [LE 1a, GR A].

Women with prolapse can present with contemporaneous urinary incontinence, obstructed defecation and sexual dysfunction.⁸⁵ In a multicenter randomized controlled trial of prophylactic Burch retropubic-urethropexy at the time of ASC, patients after Burch urethropexy showed significantly decreased risk of SUI post operatively⁹⁰ [LE 1b, GR A].

Concomitant correction of rectocele may improve the symptoms of obstructed defecation [LE 1b, GR A].⁷¹

Rectopexy: two alternative perineal approach are described for external rectal prolapse: the Delorme and Altemeir procedure. Rectopexy consists of mobilization and fixation of rectum to the sacral promontory with suture or mesh.⁹¹

A Cochrane review of 12 randomized trials with 380 patients showed no better outcomes for one treatment over another [LE 1a, GR A].⁹² Ventral and posterior rectopexy associated with sigmoid resection have less postoperative constipation and with better outcomes regarding ODS. Recurrence rate after abdominal rectum mobilization-only does not differ with others types of procedures and this procedure has a recurrence rate of 28.9% at 10 years of FU⁹³ [LE 2b, GR B].

According to Bordeianou,⁹¹ patients with complete rectal prolapse and constipation are candidates for sigmoid resection [LE 5, GR c].

In patients with preoperative findings of low resting pressure on anorectal manometry at the moment of rectopexy the division of lateral ligaments is recommended; it reduce frequency of defecation, doubling total and segmental colonic transit times⁹⁴ [LE 1b, GR A].

Laparoscopic rectopexy has less post operative morbidity and shorter hospital stay⁹⁴⁻⁹⁶ [LE 1a, GR A] but there are limitations [LE 3b, GR B].⁹⁷ To date there is not sufficient evidence to utilize robotic surgery for this type of procedure.⁹¹

13. THE PEXIES ARE THE GOLD STANDARD FOR ANY POP REPAIR? HAVE WE A CORRECT ANSWER?

Up to now this question has no answer.

Which surgical option should be chosen? Laparoscopic and laparotomic pexies have the lowest morbidity and recurrence rate.^{107,113,130-133} Despite the FDA report, transvaginal surgery with mesh can be safely performed in elderly.^{85,98}

Another very interesting procedure is the TFS technique described by Petros.⁹⁹ It is a very minimal method which reaches high level of cure of symptoms but without a powerful statistical evidence up to now.

As per the TFS technique, the placement of a TFS sling through the uterosacral ligaments to suspend the rectum from above and through the two parts of perineal body to support it from below is reported to have great results but without level 1 evidence.¹⁰⁰

Last, even if the encircling of the anus with a prosthesis¹⁰¹ surrounding the sphincter has high recurrence rate, it could be useful in elderly patients with rectal prolapse who can't undergo major surgery. [LE 4, GR C]

14. POP REPAIR AFTER THE FDA WARNING. WHAT IS OUR SURGICAL APPROACH AND WHAT HAPPENED AFTER THE WARNING?

To date are there any recommendations on the use of meshes? Regardless of the medical-legal controversies, the use of prostheses remains an appropriate treatment for many patients.^{102,103} Some recommendations are the following [LE 3, GR C]:

- before using meshes it is fundamental to inform patients on risks, benefits, surgical and non-surgical alternatives¹⁰²⁻¹⁰⁵
- the routine use of biological material is not advisable as it seem to have no real benefit¹⁰⁶⁻¹⁰⁸
- heavier weight prostheses are reported to shrink more often than lower weight ones¹⁰⁸

- In vaginal surgery macroporous monofilament polypropylene should be the choice while polyester prostheses frequently have been linked to erosion complications¹⁰⁸
- due to the pressure of industries there is a huge number of different prostheses, and the surgeon is required to have a specific skill for each different product¹⁰⁹
- a careful patient selection is crucial as individual factors may compromise the outcome (for example smoking, diabetes)
- new products must not be assumed to have an equal or improved safety and efficacy until long term data are available¹⁰²
- it is of paramount importance to continue to collect follow-up data, with the aim of reviewing long term outcomes¹⁰²

What is still lacking? Multicentre randomised controlled trials with a longer follow-up and a sufficient power are required to evaluate and compare the different surgical procedures.

15. SHRINKAGE/EROSION OF IMPLANTED MATERIAL. COMPLICATIONS EVALUATION AND MANAGEMENT. WHICH ARE THE MORE COMMON COMPLICATIONS?

Erosion is different from an extrusion which is the gradual passage of mesh out of the epithelium. The rate of erosions after vaginal surgery ranges between 5 and 19% and occurs in 3% of laparotomic sacrocolpopexies.¹⁰³⁻¹⁰⁵ Other adverse events are vaginal or pelvic pain (4-11%), dyspareunia(1-3%), rectal injuries (<0,5%).¹¹⁰⁻¹¹³

The high variability of data in the literature confounds the incidence of complications.

Is there any way to avoid complications? The experience of the surgeon is directly linked to the safety and efficacy of the procedure, and inversely linked to incidence of adverse events.⁹⁸ [LE 3-4, GR B].

It is better to avoid the use of a polyester meshes.¹¹¹ [GR B]. Medical therapy with estrogen before and after surgery does not improve outcomes.¹¹¹ [GR B]

Which are the treatment options for complications? De novo symptoms (vaginal and pelvic pain, spotting, dyspareunia, voiding dysfunctions) usually disappear within six weeks after surgery. Uncomplicated mesh erosions, (<5 mm), can be initially treated conservatively. Surgical options are partial office excision of a small exposure <5mm or in the operating room when >5mm. Removal of a great portion of the prosthesis is indicated if a previous treatment has failed or in presence of an infection or fistula.

Shrinkage/contraction of the vaginal mesh can lead to contraction band or a stricture of the vagina. Unfortunately, excision is not always effective. With voiding dysfunction simple transection of the sling without excision usually improves symptoms.^{110-112, 114} [LE 4, GR C]

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COMMENTARY

Moving forward

I read the Review and Consensus statement (POP Working Group) by La Torre et al. with great interest. The article raises further questions with regards to the treatment of pelvic organ prolapse. This commentary aims to ask those specific questions and suggest potential ways forward.

Traditionally, the management of pelvic floor dysfunction has been divided into three separate specialties, namely urology, gynaecology and coloproctology. Patients frequently present to the specialty responsible for their most overriding symptom, while their other symptoms may never be discovered or may be ignored. As a result symptoms which frequently occur together, probably with a common origin are considered separate issues and independent causes and treatments are hypothesised and recommended.

The questions for which we should be seeking answers are as follows:

1. How should patients presenting with pelvic organ dysfunction be assessed?

In the well written article by La Torre et al it is clear that it has been written from a colorectal perspective. It focuses on faecal incontinence, rectocele and obstructed defecation and further on in the manuscript describes urogynaecological symptoms as a separate issue.

In my opinion and from my experience of managing these patients, all of these symptoms need to be brought together and evaluated as a whole. Manning et al¹ described clear relationships between urinary tract abnormalities and faecal incontinence. The same group also demonstrated the relationship between urinary tract abnormalities, chronic constipation and obstructed defecation.² If we are to make significant progress in the management of patients with these problems it is no longer possible to consider symptoms in isolation.

It is therefore incumbent on any specialist wishing to evaluate a patient with pelvic organ dysfunction, as stated in the article, to take a full history of all urinary symptoms (stress urinary incontinence, urinary urgency and urge incontinence, urinary stream patterns and incomplete bladder emptying symptoms along with nocturia).

Having completed this aspect of the history, attention should be turned to the middle compartment checking for symptoms of dyspareunia, vulvodynia and asking questions regarding previous gynaecological surgery including previous repairs and their nature and type and whether or not they have had a hysterectomy. Pelvic pain, including unilateral or bilateral groin discomfort and sacral backache are frequently present.

Finally, attention can be turned to the posterior compartment elucidating symptoms of constipation, irritable bowel like syndromes, passive and stress faecal incontinence, obstructed defecation, haemorrhoids and anal fissures, again including any history of previous surgery attempting to correct the symptoms.

Examination again, involves a tri-compartmental assessment. Firstly anteriorly, of the urethra and its surrounding tissues, and the bladder for cystocele, In the vagina a speculum examination is needed to look at the cervix for apical descent and enterocele. Finally, examination of the posterior compartment includes digital rectal examination, sigmoidoscopy and determination of rectocele, perineal descent and benign anal pathologies.

2. What approach should be taken for the findings from the assessment?

The above method of patient assessment, once it becomes an ingrained and natural process to the specialist will reveal reproducible, reliable and repeatable patterns of symptoms and examination findings. These are no coincidence. In fact, a patient pre-

senting with an isolated symptom (other than stress urinary incontinence) in the absence of any other findings should raise suspicion as to causes outside of organ prolapse.

One particularly common symptom complex of obstructed defecation, urinary urgency, nocturia, pelvic pain and deep dyspareunia, has already been described by Petros and Ulmsten and given the name Posterior Fornix Syndrome.³ With increasing expertise clinicians will uncover further 'complexes' of their own, named or otherwise.

Almost always, these symptoms are associated with findings of organ prolapse at examination. However, it is well-recognised that some patients even with severe symptoms have minimal evidence of prolapse and these are often some of the most difficult patients in whom to advise management and treatment.

So what do we treat? Symptoms or prolapse? In the majority of cases unless the degree of prolapse has reached grade 2 to 3 where it is visible or palpable at the introitus, most patients are unaware of lesser degrees of descent. In the absence of symptoms these patients do not require treatment. If there are no symptoms, treatment of these incidental findings will provide no clinical improvement but places the patient at risk of unnecessary complications which should therefore be avoided.

For patients with significant symptoms the options are conservative or surgical. Conservative measures include pelvic floor physiotherapy, behavioural training, nutritional advice, and pharmacological agents. A critical look at these approaches will show that each aspect of the advice is aimed at a single symptom but may not serve to improve the global problem. Drinking less water in combination with anticholinergics to the point of dehydration may help with over active bladder and nocturia but only serve to worsen any obstructed defecation. The use of laxatives and stool softeners may help constipation and obstructed defecation but may serve to worsen any coexistent faecal incontinence.

It is more than likely therefore that conservative measures can be aimed at a single salient symptom in the absence of more prominent associated symptoms. Where the symptoms are severe and multiple, conservative management, especially when compartmentalised is unlikely to provide the patient with the improvement that they seek.

3. How should it be investigated?

For the most part a comprehensive history and examination will tell the clinician almost everything that is required to advise management. However, at times there will be difficulties in correlating examination findings to the history and there may be conflicting information provided by both the history and examination together. In order to confirm suspicions, clinicians may rely on further investigations such as ultrasound and proctography to image the functional behaviour of the various compartments in question, in order to make a definitive diagnosis. Anorectal manometry and urodynamics are more likely to find a place as research tools than to guide individual patient management.

It must also not be forgotten that many patients will have foregone their normal screening procedures and before any attempt is made to approach symptoms from a functional perspective organic pathology must be excluded. This may require cystoscopy, colonoscopy/smear, or colonoscopy along with appropriate imaging using Ultrasound, CT or MRI where indicated. Need for these investigations is reliant upon the expertise of the involved clinician.

4. What surgical approaches are available and on what paradigms are they based?

It is difficult to argue against the logic that the surgical approach to the patients' symptoms and associated prolapse, should where possible be based on a theory that determines causation based on natural physiological function, relates symptoms to anatomical abnormalities that guide surgical repair and aims to restore the anatomy as close as possible to its congenital origins.

At present the only theory that satisfies the criteria listed above is the Integral Theory originally proposed by Petros and Ulmsten.⁴ The theory is based on the hypothesis that weakened ligaments that support the female pelvic organs are responsible for the symptoms, namely, the pubourethral ligament, the cardinal ligament, the uterosacral ligament and the deep transverse perineal ligament/body. It is suggested in this theory that direct repair of these ligaments using reinforcing tapes tensioned appropriately within the native ligament will restore the anatomy, restore function and improve symptoms. The theory relates different ligaments and combinations of ligaments to different symptoms and combinations of symptoms in a reliable and reproducible manner. Current evidence appears to support that this approach has the greatest impact on global symptoms of all the operations that are currently proposed.

Even the gold standard laparoscopic mesh ventral rectopexy performed by colorectal surgeons only addresses the posterior compartment symptoms. Abdominal sacrocolpopexy is often non-anatomical and is aimed more at prolapse than symptoms. Frequently hysterectomy is advised but there appears to be no solid evidence or concept to support this.

The Tissue Fixation System of surgical repair, based on the Integral Theory, provides a more long-term support compared to the native tissue repair and due to the use of mesh tapes rather than mesh sheets uses the absolute minimum of prosthesis required to provide the necessary support. In fact only 3 to 4 cm of each tape is in direct contact with vaginal tissue per se, the remainder being contained within the ligament. It also facilitates the natural physiological movement of the rectum and bladder around the vagina. The tape is only 7mm in width, non-stretch and the anchors provide a tensioning system which allow it to be tensioned to the individual needs of each patient. The system itself is minimally invasive, highly precise and anatomical. It aims to address all of the symptoms at the same procedure.

Doubtless, any reader who is aware of another operation that also satisfies these criteria that has not been mentioned in this Commentary will write to the Journal.

5. Who should be performing the surgery?

A multi-compartmental surgical approach to pelvic organ prolapse and associated symptoms requires an understanding of the surgical anatomy of all three compartments, something that is not currently taught by the individual disciplines. A global approach to pelvic organ prolapse especially that based on the Integral Theory necessitates specific training requirements and fellowships at a

senior level of training, tailored accordingly. At present these are simply not available and it is requisite upon any specialist to try and obtain this training after their substantive appointment. This is difficult, time consuming and expensive. Many may wish not to do this and to continue to perform the more standard surgery taught as part of current postgraduate training.

We can no longer follow the old adage of "see one, do one, teach one." Surgeons must be as rigorously approved to use a prosthetic product, as the product was to gain license and registration in the first place. One without the other does not protect the patient.

In my opinion, to move forward, first we must go backwards. We must disassemble the current multi-compartmental approach of urology, gynaecology and colorectal surgery. We must start again. We must use the knowledge we have for revolution not further evolution. Comprehensive training in all aspects of pelvic dysfunction should be the standard. Functional pelvic medicine may separate from oncological and other aspects within the disciplines. The pressure to do this must come from trainees. It will not come from the Colleges. After all, they exist to serve their own compartment. We must challenge the idea that one compartment is king. The King is dead. Long live the Pelviperineologist!

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