



Pelvic Reconstructive Surgery in Urogynaecology

Jayalath JAVS¹

¹*Specialty Registrar in Obstetrics and Gynaecology, York and Scarborough Teaching Hospital, United Kingdom.*

Corresponding author – Dr. Jayalath J.A.V.S.

Email: sharadajayalath@yahoo.com

Abstract

Pelvic organ prolapse (POP) is a prolapse of one or more of the anterior vaginal wall, posterior vaginal walls, uterus (cervix), and vaginal vault (after hysterectomy). Pelvic reconstructive surgery plays a key role in management of POP. This is subclassified in to different classifications based on the anatomical position and the approach of the surgery. Uterine preserving surgery for uterine prolapse has become more popular during recent decades.

Introduction

Pelvic organ prolapse (POP) is a herniation of the pelvic organs including uterus, vaginal cuff, bladder, urethra, small or large bowel, rectum, and associated vaginal segments due to weakness or defect in the pelvic floor. POP is defined by the International Urogynecological Association (IUGA) and International Continence Society (ICS), in Joint Report on Terminology, as the “Descent of one or more of the anterior vaginal wall, posterior vaginal wall, the uterus (cervix) or the apex of the vagina”¹. Prevalence of pelvic floor

dysfunction is estimated as 30-50% of the female population.

POP is sub-classified as anterior compartment prolapse, apical compartment or uterine prolapse, and posterior compartment prolapse. Different types of pelvic organ prolapse includes;

- Anterior compartment – cystocele, urethrocystocele
- Apical compartment – uterine prolapse, vaginal vault prolapse (post-hysterectomy)
- Posterior compartment – enterocele, rectocele

POP can be managed with conservative management and surgical management. Surgical management of POP includes pelvic reconstructive surgeries and pelvic obliterative surgeries. Pelvic reconstructive surgery is the restoration of the pelvic floor support. Main goals of pelvic reconstructive surgery includes; repairing all the defects, restoration of normal anatomy, maintaining normal vaginal function, improvement of symptoms related to POP, improvement of QOL, and prevention of recurrence. Life time risk of surgery for POP is 11% by age of 80 years². Reoperation risks after previous surgery is 13-56%.

Reconstructive surgery for POP is sub-classified in to different classifications based on the anatomical position of the defect and the approach of the surgery.



Classification based on the anatomical position is done as anterior compartment surgeries, posterior compartment surgeries and apical compartment surgeries. Classification based on the surgical approach is done as transvaginal approach, transabdominal (open) approach, laparoscopic and robotic (da Vinci robotic surgery) approach. Choice of the surgery will be based on the type and severity of POP, surgeon's skills, surgical experience, and patient's preference.

Clinical Presentation

Common presentations of POP includes bulge in the perineum and palpable mass in the perineum³. It may also present or associate with urinary symptoms, bowel symptoms, vaginal discharge, PV bleeding, ulceration, and perineal discomfort. Urinary symptoms may include voiding symptoms like hesitancy, poor stream, retention and incontinence. Bowel symptoms may include constipation and fecal soiling. Common sexual symptoms may include lack of sexual desire and superficial dyspareunia. Some women may have significant effects of quality of the life, increasing the risk of depression and anxiety.

Diagnosis of POP

Diagnosis of POP is by clinical examination usually at dorsal position or some times at standing position. Valsalva manoeuvre is used to demonstrate maximum descent. Each compartment is assessed separately. Different classification systems are used to stage the degree of descent. The POP-Q grading system is the widely accepted, objective and a reproducible system, adopted by the International Continence

Society (ICS), which classifies prolapse into grades 0 to grade IV⁴. The quantitative assessment of the anterior, apical, and posterior vaginal supports, the genital hiatus, the perineal body, and the vaginal length helps surgical planning when planning the management. The degree of the prolapse in each compartment is measured separately compared to the level of hymen. Co-existing stress urinary incontinence should be assessed during the examination.

The Modified Oxford Scale (MOS) is used to assess pelvic floor muscle strength on a scale of 0 to 5; 0 = no contraction; 1 = minor muscle 'flicker'; 2 = weak muscle contraction; 3 = moderate muscle contraction; 4 = good muscle contraction, and 5 = strong muscle contraction⁵. Digital assessment of pelvic floor muscle contraction was performed by inserting the index and middle fingers approximately 4cm into the vagina and palpating the puborectalis muscle at each side of the vagina during the contraction.

Surgeries for POP

1. Colporrhaphy (Native tissue repair)

Colporrhaphy is a minimally invasive traditional surgical procedure which repairs the pelvic floor defect. This consists of removal of excessive over-lying vaginal wall, restoration and support of the prolapsed pelvic organ, and plication of the under-lying supportive fascia. This is subclassified as anterior colporrhaphy and posterior colporrhaphy based on the anatomical location of the surgery. However, this may be associated with increased recurrence risk of 30%.



Anterior colporrhaphy / Cystocele repair

- is the repair of anterior vaginal wall defects. This is repaired by excision of excessive vaginal wall and central plication of fibromuscular layer of anterior vaginal wall. Success rate of the procedure is 80-100% at 1 year follow-up and 37-57% at long-term follow-up⁶. Main drawback of the procedure is high recurrence rate.

Posterior colporrhaphy / Rectocele repair

- is the repair of posterior vaginal wall defect which involves plication of the posterior vaginal muscularis and rectovaginal septum or medial aspect of levator ani muscle in the midline. It also narrows the diameter of the vaginal canal, traditionally up to three-fingerbreadth genital hiatus. Usually, the procedure is performed with perineorrhaphy together. Posterior colporrhaphy has an anatomic cure rate of 76% to 96%⁷.

2. Transvaginal mesh repair

Transvaginal mesh repair is a controversial topic and is not widely practised due increased rate of drawbacks including vaginal mesh exposure, bladder or urethral erosion, dyspareunia, and significant pelvic pain. Synthetic mesh repair was first approved by the United States Food and Drug Administration (FDA) in year 2002. Afterwards, it was used commonly due to its “user-friendly” format. Currently its use is not recommended by FDA, and the United Kingdom’s Medicines and Healthcare products Regulatory Agency (MHRA)^{8,9}.

However, recently published Cochrane Library meta-analysis showed non-absorbable mesh repair reduces the risk of anatomical recurrence, repeat surgery for prolapse recurrence, as well as patient

awareness of prolapse after surgery, when compared to non-mesh repair¹⁰. Conversely, the recently published “PROlapse Surgery: Pragmatic Evaluation and randomised Controlled Trials” did not show significant difference in patient satisfaction, quality of life, and anatomic success when comparing synthetic mesh and native tissue repair¹¹.

In summary, the decision on mesh repair is still remain highly controversial. Traditional native tissue repair remains a mainstay of POP surgery for uncomplicated cases. Transvaginal mesh repair can be considered as second-line procedure, or for patients with significant grade of prolapse who are at a higher risk of recurrence, and these procedures should only be performed by a well-trained and skilled surgeon.

3. Vaginal vault suspension

Apical compartment prolapse can be treated with apical suspension techniques which include sacrospinous ligament suspension and uterosacral ligament suspension. Currently available evidence does not demonstrate superiority of either technique. Vaginal vault suspension techniques are considered as low risk and most suitable for elderly and sexually non-active patients who are not suitable for abdominal vault suspension.

Sacrospinous ligament suspension / Sacrospinous fixation (SSF) – is the most commonly used transvaginal procedure and can be done as unilateral or bilateral procedure. Right-side is more preferred. The vaginal vault is anchored to the sacrospinous ligament, restoring its support. SSF is associated with increased risk of postoperative dyspareunia due to



deviation of the vaginal angle, increased buttock pain (30%), and higher recurrence rate (30%). Objective cure rate is 67-97%.

Uterosacral ligament suspension – the vaginal vault is anchored to the uterosacral ligament. However, this procedure is associated with increased risk of ureteric obstruction in 3.7% of the cases due to its close proximity to ureter¹².

4. Abdominal sacrocolpopexy (ASC) / scarohysteropexy (ASH)

ASC / ASH is used in isolated apical compartment prolapse or combined apical and anterior compartment prolapse¹³. During this procedure, the vaginal vault or cervix is anchored to the anterior surface of the sacral promontory, by means of a mesh (usually a synthetic polypropylene mesh). The procedure can be done as a open laparotomy procedure, laparoscopic procedure and robotic assisted procedure.

Main benefit of ASC is significantly lower postoperative dyspareunia and considered as the choice of option for sexually active women¹⁴. The success rate of the procedure is 90% at 5 years, and 74% at 13.7 years.

Laparoscopic ASC has the advantages of shorter hospital stay, early recovery, less post-operative pain and decreased blood loss¹⁵. Recent randomised control trial showed that open and laparoscopic ASC were equivalent for apical prolapse repair, but that the laparoscopic approach was inferior with regard to concomitant anterior compartment prolapse¹⁶.

The da Vinci Surgical System is a robotically assisted surgical device used for ASC in robotic surgery and approved by FDA in year 2000. Main advantages of

robotic assisted surgery over laparoscopic ASC includes better depth perception due to 3D vision, better ergonomics, fast learning curve and more natural surgical feel¹⁷. The technique is more similar to open repair but with the decreased operative morbidity associated with laparoscopy. However, cost and the operative time for robotic surgery was significantly higher.

5. Vaginal hysterectomy and repair

Vaginal hysterectomy with POP repair is the traditional mainstay of primary POP surgery due to easy access to pelvic ligaments and tissues for vaginal suspension, especially in uterine prolapse. Vaginal hysterectomy is typically accompanied by vaginal vault suspension by either uterosacral ligament suspension (USLS) or sacrospinous ligament fixation (SSF). Vaginal hysterectomy is considered superior to abdominal or laparoscopic hysterectomy due to shorter duration of hospital stay (WMD 1.0 day, 95% CI: 0.7 to 1.2 days), early return to normal activities (WMD 9.5 days, 95% CI: 6.4 to 12.6 days), and fewer unspecified infections or febrile episodes (OR 0.42, 95% CI: 0.21 to 0.83)¹⁸.

However, uterine presserving surgery was introduced in recent decades and became more popular. Systematic reviews indicate that uterine preserving surgery is associated with lower perioperative risks than vaginal hysterectomy, with comparable rates of POP cure¹⁹. Different options available for uterine preservation surgery include the Manchester Fothergill's operation, sacral hysteropexy (abdominal, laparoscopic or robotic with or without mesh), uterosacral ligament hysteropexy, sacrospinous



hysteropexy (with or without mesh), and colpocleisis²⁰.

6. Colpocleisis

Colpocleisis is considered as an pelvic obliterative surgery. LeFort colpocleisis procedure involves removal of strips of anterior and posterior vaginal epithelium, leaving a small strip of lateral epithelium on each side and suturing of the remaining vaginal epithelium to creat a outlet for cervical or uterine bleeding or drainage. This is considered as the last resort if all other options are not applicable.

Conclusion

Pelvic reconstructive surgeries play key role in the management of POP. Colporrhaphy is considered as the management of choice for mild POP, after failure of conservative management. Transvaginal mesh repair for POP is highly contraversial and can be considered in selected cases, especially in recurrent POP following failing of traditional colporrhaphy. ASC is the treatment of choice for apical compartment prolapse, especailly in sexually active women. Laparoscopic ASC is considered superior over open ASC due to early recovery, early return to work and minimal blood loss. Robotic assisted ASC is very costly and time consuming. Vaginal hysterectomy with POP repair is performed in uterine prolapse but carries higher perioperative and postoperative risks. Uterine preserving surgeries become more popular in recent decades due to lower risk of complications compared to traditional vaginal hysterectomy.

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