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# Prolapse and sexual function

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### Abstract

Pelvic organ prolapse is a common medical problem in parous women that becomes particularly acute with advancing age. As life expectancy increases, this condition is acquiring greater significance: 20% of women on gynaecology waiting lists in the UK are awaiting prolapse surgery, which demonstrates the enormity of this virtual pandemic. Prolapse usually refers to a combination of deficiencies of the support mechanisms of the vaginal wall, and symptoms vary depending on the organs affected. Accurate diagnosis requires a careful and complete physical examination. The literature review presented in this paper revealed conflicting results regarding the impact of prolapse on sexual function. The authors also discuss the pathophysiology of prolapse and the effects of different forms of treatment, both conservative and surgical, on sexual function, as well as the debates surrounding some of the current forms of treatment that are available.

*Keywords:* pessary, physiotherapy, prolapse, sexual function, surgery.

### Introduction

The word prolapse is derived from the Latin word *prolapsus*, and means a slipping forth or falling out of place of a part or viscus. A prolapse occurs when there is a defect in the pelvic floor that is sufficient to allow one or more of the pelvic viscera to fall through. The incidence of genital prolapse is difficult to determine because many women do not seek medical advice. Broad estimates suggest that 50% of all parous women lose the support of the pelvic floor and have some degree of prolapse (Beck 1983), with 10–20% seeking medical aid for their problem.

Although it is not life-threatening, prolapse can adversely affect the quality of life of many women, predominantly with advancing age (Olsen *et al.* 1997). Conversely, with lack of oestrogen, atrophic vaginas in later life are often scarred and retracted because of the fibrosis replacing lost collagen. This is particularly of significance with an advancing geriatric population and is likely to worsen with increasing life expectancy. The UK Hospital Episode Statistics suggest that over 20% of women on gynaecology

waiting lists are awaiting surgery for genital prolapse. The incidence of prolapse requiring surgical correction in women who have had a hysterectomy is 3.6 per 1000 person years of risk; the cumulative risk is 1% and 5% at 3 and 17 years after a hysterectomy, respectively (Mant *et al.* 1997). In women undergoing surgery for prolapse, up to one-third of procedures represent recurrent operations (Olsen *et al.* 1997). Because of the high risk of recurrence and the need for repeat surgery, it is important to select the optimum surgical procedure in an individual patient.

The present paper deals with the pathophysiology of prolapse and its impact on sexual function, as well as the effects of different forms of treatment, both conservative and surgical.

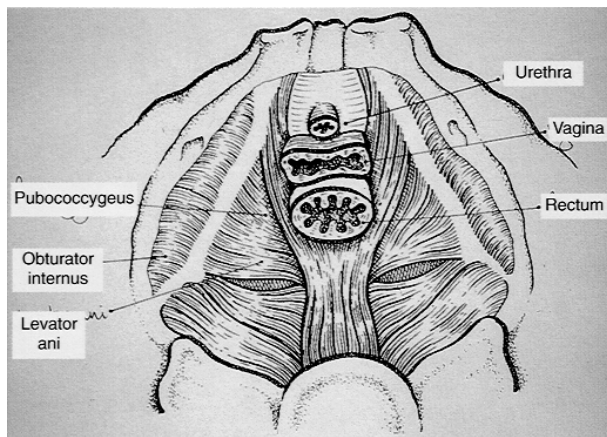
### Pathophysiology

A large retrospective cohort study (Olsen *et al.* 1997) of women undergoing surgical treatment for prolapse and incontinence during 1995, which included 149 554 women aged 20 years or older, demonstrated that the lifetime risk of undergoing a single operation for prolapse or incontinence by 80 years of age was 11.1%.

Normal supports of the vagina and adjacent pelvic organs are provided by the interaction

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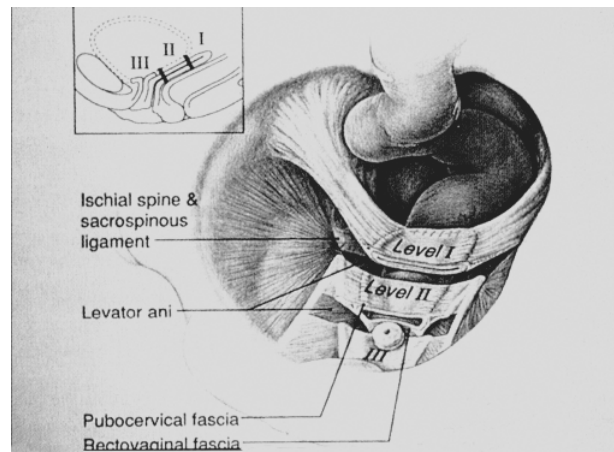
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**Figure 1.** The levator ani complex.

between the levator ani muscle and the connective tissue supports. In adult women, the pelvic floor is inherently weak, predominantly as a result of their upright posture. Also on account of this orthograde posture, the fascial layers of the pelvic floor are very well developed, in order to provide support for pelvic organs. The pelvic diaphragm collectively refers to the levator ani muscles and the connective tissue attachments to the pelvis (Fig. 1). Although the levator ani muscle has two component parts, i.e. the diaphragmatic part (the coccygeus and iliococcygeus muscles) and the pubovisceral part (the pubococcygeus and puborectalis), it functions as a single unit. The levator ani is a skeletal muscle with a baseline resting tone and can be voluntarily contracted. The type I fibres (slow twitch) provide constant tone, and the type II fibres (fast twitch) provide reflex and voluntary contractions.

Contrary to previous belief, the connective tissue fibres are just as important as the pelvic muscles in providing support to the pelvic organs, but their role is different. The fascial components comprise of two types of fascia, parietal and visceral (endopelvic). The parietal fascia covers the pelvic skeletal muscles and provides attachments of the muscles to the bony pelvis. The visceral fascia exists throughout the pelvis as a network of loosely arranged collagen, elastin and adipose tissue, through which blood vessels, lymphatics and nerves travel to reach the pelvic organs. DeLancey (1992) described three levels of endopelvic fascia support for the vagina (Fig. 2). The upper third of the vagina (level I) is suspended from the pelvic walls by the vertical fibres of the paracolpium, which is a continuation of the cardinal ligament. In the middle third of the vagina (level II), the paracolpium attaches the vagina laterally to the arcus tendineus and



**Figure 2.** DeLancey's three levels of connective tissue support for the anterior vagina. Reproduced with permission from DeLancey (1992).

fascia of the levator ani muscles. The lower third of the vagina (level III) fuses with the perineal membrane, levator ani muscles and perineal body.

The pathophysiology of pelvic floor disorders is complex and multifactorial. The features include a combination of genetic predisposition, and acquired dysfunction of the muscular and connective tissue support systems caused by parturition or the menopause. Damage to the pelvic diaphragm causes the levator plate to become more oblique, creating a funnel that allows the uterus, vagina and rectum to herniate, resulting in a prolapse. In women with severe prolapse, a 50% loss of motor units of the perineal muscles has been demonstrated (Sharf *et al.* 1976). There is also evidence of fascial denervation (Parks *et al.* 1977).

### Classification

As vaginal wall prolapse is a protrusion of one or more pelvic organs (e.g. the bladder or the rectum) through the vaginal fascia, and the displacement ('prolapse') of the associated vaginal wall from its normal location into or outside the vagina, there are different types of vaginal wall prolapse, depending on the organs and sites involved. These include anterior vaginal wall prolapse (e.g. urethrocele and cystocele), posterior vaginal wall prolapse (e.g. rectocele and enterocele) and apical vaginal wall prolapse (affecting the uterus or the vault in women who have had a hysterectomy). A woman can also present with prolapse of a combination of these sites.

Many systems for staging prolapse have been described, but because of a lack of subjectivity,

**Table 1.** Pelvic Organ Prolapse – Quantification (POP-Q) system: (TVL) total vaginal length; and (GH) genital hiatus

Point	Location	Range of values
Aa	Arbitrary point on the anterior wall, measured 3 cm from the external urethral meatus	– 3 to +3 cm (– 3 cm with no prolapse)
Ba	Most dependent portion of the anterior vagina	Value is – 3 with no prolapse; the maximal eversion point would be the positive value of the TVL
C	Least supported portion of the cervix or vaginal cuff after hysterectomy	When fully supported, this is the negative value of the TVL; when maximally prolapsed, it is the positive value of the TVL
Ap	Arbitrary point on the posterior vaginal wall, measured 3 cm from the hymen	– 3 to +3 cm (– 3 cm with no prolapse)
Bp	Most dependent portion of the posterior vagina	Value is – 3 with no prolapse; the maximal eversion point would be the positive value of the TVL
D	Position of the cul-de-sac	Point D ranges in value from positive to negative the TVL; it is not measured after hysterectomy
TVL	Total vaginal length	From the hymen to the posterior fornix (or the vaginal apex after hysterectomy)
GH	Genital hiatus	From the midpoint of the external urethral meatus to the posterior midline hymen
PB	Perineal body	From the posterior midline hymen (GH site) to the mid-anal opening

these have been fraught with problems. The standard for prolapse assessment for clinical researchers is the system accepted by the International Continence Society, the Pelvic Organ Prolapse – Quantification (POP-Q) (Bump *et al.* 1996). Its advantage over previous grading systems, which have included a general grading as mild, moderate and severe, and more complex classifications, such as the Baden–Walker Halfway Scoring system (Baden *et al.* 1968), is that the assessment of prolapse for all sites of the vagina is done as well as a quantitative measurement of prolapse with straining relative to the hymen. The POP-Q system makes measurements in nine locations on the vagina and vulva in centimetres relative to the hymen (Table 1).

### Clinical presentation

Vaginal wall prolapse can affect a woman's quality of life by its local physical effects (e.g. pressure, bulging, heaviness or discomfort), and its effect on urinary, bowel or sexual function. Symptoms depend largely on the organ that has prolapsed, although the symptom of 'something coming down' is almost universal. Women describe a vaginal lump that is usually asymptomatic when they get up in the morning and gradually gets worse as the day progresses.

A uterovaginal prolapse protrusion of the cervix gives a feeling of pressure, and when the prolapse is protruding outside the introitus, bleeding, ulceration of the protruded lump and discharge may present.

An anterior vaginal wall prolapse (cystocele) often presents with urinary symptoms. Increased frequency related to a large residual or recurrent urinary tract infections may occur. Contrary to popular belief, prolapse does not cause stress incontinence (SI), and in fact, the symptoms of SI may be masked by the increasing size of the prolapse. Some women may even complain of having to reduce the bulge digitally in order to pass urine, but more commonly, they describe voiding difficulty, with a need to strain, double void or rock in order to empty their bladders. In the presence of large prolapse and vaginal eversion, back flow resulting in hydroureter and hydronephrosis may occur, although this is reversible following correction of the prolapse.

By comparison, a posterior vaginal wall prolapse (rectocele and/or enterocele) may be asymptomatic until it becomes quite large. There may be difficulty with defecation, tenesmes or problems with intercourse.

Other symptoms that may occur in patients with prolapse include pelvic pain, low back ache, and the consequences of a vaginal protrusion, such as difficulty walking.

**Table 2.** Tools used for assessment of sexual function

Tool/questionnaire	Abbreviation
Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire	PISQ
Prolapse and Incontinence Sexual Function Questionnaire – Short Form	PISQ-SF
Female Sexual Functioning Index	FSFI
Electronic Pelvic Assessment Questionnaire – Pelvic Floor	ePAQ-PF
Sexual Function Questionnaire	SFQ
Profile of Female Sexual Functioning	PFSF
Sexual Personal Experiences Questionnaire	SPEQ
Arizona Sexual Experience Scale	ASEX
Center for Marital and Sexual Health Sexual Functioning Questionnaire	CMASH-SFQ

### Sexual function associated with prolapse

Sexual dysfunction in women is common, with a community prevalence of 30–50%. Sexual function is complex, and relates to physical, psychological, emotional and partner-related factors. Assessment of sexual function requires tools that are reliable, valid and condition-specific.

Prolapse causes several problems with sexual function including discomfort, urinary incontinence (40%) (both at orgasm and at penetration), obstruction and dryness during intercourse.

The problems with the assessments of sexual function reported in the different studies reported in the literature are that:

- (1) different tools have been used in different studies (Table 2);
- (2) the studies cluster prolapse and incontinence under the same umbrella;
- (3) the study groups are small; and
- (4) the different types of prolapse are lumped together (e.g. different compartments and different grades).

The gold standard tool for the assessment of sexual function in women with prolapse or incontinence is the Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ). This is a condition-specific questionnaire with 31 item responses measured on a five-point Likert scale. Three separate and distinct domains of sexual function are assessed:

- (1) Behavioural Emotive Domain (sexual desire, frequency of sexual activity and orgasmic capabilities);
- (2) Physical Domain (effect of urinary incontinence on sexual function); and
- (3) Partner Related Domain (patient's perception of her partner's sexual functioning and of her partner's response to the effect of her pelvic floor disorder).

Shortened versions of this questionnaire (i.e. the PISQ-12 and PISQ-9) are being evaluated.

There is a multitude of studies reporting on the impact of prolapse on sexual function, but the results are very conflicting, with some being equivocal and reporting no impact of prolapse on sexual function, and others demonstrating a deterioration of sexual function as a result of prolapse.

A study by Weber *et al.* (1995) that compared 80 women with prolapse with or without incontinence and 30 controls (women with no prolapse) showed no difference in global sexual function score, vaginal dryness, dyspareunia, interest in sexual activity or satisfaction with their sexual relationship. The above authors concluded that women with prolapse and urinary incontinence do not differ from continent women without prolapse in measures of sexual function, and that age is the most important predictor of sexual function.

Burrows *et al.* (2004) came to similar conclusions in their retrospective study of 352 women with prolapse. They also found that prolapse severity did not impact on sexual function.

A study by Barber *et al.* (2002) that compared the impact of prolapse and incontinence on sexual function found the opposite. In their review of 343 community-dwelling women with either symptomatic prolapse or incontinence, they found that prolapse was more likely to influence sexual function than urinary incontinence. This study also demonstrated that treatment of prolapse was less likely to impact on change in sexual function, whereas treatment of incontinence resulted in a mild improvement in sexual function.

A report by Novi *et al.* (2005) described similar results, but this was a much smaller study of 30 women with prolapse and 30 controls.

## **Treatment for prolapse and impact on sexual function**

Current treatment options for vaginal wall prolapse include pelvic floor muscle training (physiotherapy), the use of topical hormone replacement therapy, the use of mechanical devices (i.e. ring or shelf pessaries) and surgery, with or without mesh reinforcement. The impact of these different forms of treatment for prolapse on sexual function is discussed below.

### *Physiotherapy*

A systematic review by Hagen *et al.* (2006) of the benefits of pelvic floor muscle training (PFMT) identified some benefit on sexual function in women with mild prolapse. Even more reassuringly, women who were currently performing PFMT scored significantly better on several aspects of sexual function (Beji *et al.* 2003; Dean *et al.* 2008), and therefore, women should be encouraged to do this form of exercise.

### *Oestrogen therapy*

There have been no studies investigating the impact of oestrogen therapy in women with prolapse or its impact on sexual function. However, several reports have described an individual improvement in symptoms of atrophic vaginitis, which may impact negatively on sexual function, even in the absence of prolapse, and hence, this treatment may be considered for that indication.

### *Pessaries*

There are a variety of pessaries available, and these are made of rubber, plastic or silicone-based material. The commonest pessaries are the rings and shelf, but other types that are being increasingly used include the inflatable, the doughnut and the Gellhorn, all of which have slightly different uses and specifications. A recent study by Kuhn *et al.* (2009) demonstrated that desire, lubrication and sexual satisfaction significantly improved with pessary use, although the ability to achieve orgasm remained unchanged.

### *Surgery*

Surgical correction of prolapse depends largely on the compartment that is affected. For vaginal wall prolapse, it may involve an anterior colporrhaphy/anterior vaginal wall repair, posterior colporrhaphy/posterior vaginal wall repair or a vaginal hysterectomy. For a vaginal vault prolapse, surgical correction may require a sacrospinous fixation, an abdominal sacrocolpopexy or an infracoccygeal procedure that

involves the use of a mesh (e.g. Apogee or Post I-Stop).

In *Operative Gynecology*, Richard TeLinde (Rock & Jones 2008) wrote, 'Every honest surgeon of extensive and long experience will have to admit that he is not entirely and absolutely satisfied with his long-term results of all his operations for prolapse and allied conditions,' and this statement is further substantiated by the repeat surgery rates for recurrent prolapse being in the region of 30%.

Weber *et al.* (2000) identified a decrease in the vaginal dimensions after surgery for prolapse, and this was associated with either no alteration in sexual function or a mild improvement. However, in this study, patients undergoing a colposuspension in conjunction with a posterior repair had a significant deterioration of sexual function.

In their review of hysterectomy and its different routes, Thakar & Sultan (2005) demonstrated that it had no impact on sexual function (or bowel and bladder function). Their long-term follow-up showed that no significant changes had occurred (Thakar *et al.* 2008).

Studies looking at posterior vaginal wall defects are more confusing, and whereas earlier studies suggested that dyspareunia and problems with intercourse (Kahn & Stanton 1997) could be addressed with a posterior repair, this has not been substantiated in more recent studies. This could be because of a recognition of the problem and a change in technique (Paraiso *et al.* 2006).

In a comparison of the two most common procedures for vault prolapse, Maher *et al.* (2004) found that, whereas both abdominal sacral colpopexy and vaginal sacrospinous colpopexy are both highly effective in the treatment of vaginal vault prolapse, abdominal sacrocolpopexy has a lower rate of recurrent vault prolapse and dyspareunia compared to sacrospinous fixation.

### *Mesh*

The aims of using mesh in the repair of vaginal wall prolapse are to add additional support and reduce the risk of recurrence, particularly for women with recurrent prolapse or those who have congenital connective tissue disorders (e.g. Ehlers-Danlos or Marfan syndromes).

A recent study by Abdel-Fattah & Ramsay (2008) that investigated the complications of mesh reinforcement identified some very severe complications, and therefore, the need for

caution when using synthetic materials in the absence of clear-cut indications.

Interestingly, Milani *et al.* (2005) demonstrated that, although the use of mesh was associated with a high anatomical success rate, dyspareunia disappointingly occurred in 20% of subjects after anterior repair and in 63% when the technique was used for posterior repair. Such data suggest that the use of mesh warrants extensive counselling and caution in women who are sexually active. These results are further borne out by other studies, although some reports are equivocal and some even demonstrate an improvement following the use of mesh in vaginal repair.

### Conclusions

The verdict is still open on the impact that prolapse has on sexual function, and larger epidemiological studies are required to substantiate or refute the conflicting evidence that is currently available. This will also be partly achieved by the long-term follow-up of randomized controlled trials.

Irrespective of the overall impact of prolapse, there does appear to be some evidence to support an improvement in sexual function following treatment. Conservative treatment, particularly physiotherapy, demonstrates a beneficial effect, and we await the results of the Pelvic Organ Prolapse Physiotherapy trial, which is evaluating the role of physiotherapy in pelvic organ prolapse.

The results following surgical correction remain somewhat conflicting. The use of mesh for prolapse repair has to be tempered with caution, especially in a young, sexually active population, since the benefits of its use are still open to debate and there is potential for great harm. As new technologies are being developed, with little evaluation, the emphasis needs to be on more rigorous training and audit of outcomes. Certainly, the principle of 'first, do no harm' should be applied to surgery and sexual function in prolapse.

When counselling women with a prolapse and particularly before treatment, these factors should feature in the discussion and aid decision-making. This creates more realistic expectations of the treatments available and avoids disappointment when those goals are not met.

There remain many unanswered questions, but it is important to remember that the presence

of an anatomical defect does not imply dysfunction. The goal of pelvic surgery should be the restoration of anatomical support without deleterious effects on visceral and sexual function. Data are currently limited on quality of life and sexual function following both traditional and graft-reinforced anterior vaginal prolapse surgery, and further research is required to determine whether the surgical technique and type of graft used impact on surgical outcome and complications before these are introduced into routine clinical practice.

Women should be counselled and managed depending on current best available evidence. One hundred years ago, White said, 'Plastic gynaecology remains the last unsolved problem of surgical gynaecology,' and this remains true, even in the twenty-first century.

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