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Different treatment tactics of the pelvic organ prolapse according to the type and the degree of the prolapse: A narrative review

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Abstract

Background: Women frequently experience pelvic organ prolapse, significantly impacting their quality of life. Pelvic organ prolapse has a variety of treatment opportunities that should be used to each patient's needs, but the general rule is that only those exhibiting symptoms should receive care.

Aim: to evaluate the treatment options for prolapse, depending on the type of prolapse and its degree.

Methods: In this review, English studies from common databases such as Pubmed/MEDLINE, Web of science, Scopus, and the Cochrane Library with the keywords "pelvic organ prolapse," "uterine prolapse," "vaginal hysterectomy," combined with keywords, involving "laparoscopic hysterectomy," were involved. The end date for this review is February 2022.

Scientific novelty: The main objective of this paper is to evaluate the treatment options for prolapse, depending on the type of prolapse and its degree. Even though many researchers assessed these treatment options, very few researchers reported about the treatment options according to the degree of prolapse. Many researchers compared surgical interventions for the management of pelvic organ prolapse. Though there are similar works, in the present study, the results of the surgical management depending on the severity of the prolapse were evaluated.

The practical significance of the result obtained: The results may help physicians to determine the option of management depending on the degree of prolapse. First-degree (mild) usually does not require any treatment. Second-degree (moderate) may be treated with pessary, exercise, and surgery. Third-degree (severe) may be treated with pessary or surgery. Fourth-degree (complete) may be treated with vaginal hysterectomy, sacrocolpopexy, colpocleisis, and uterosacral ligament suspension.

Conclusion: Depending on the surgeon's expertise, using various approaches, pelvic organ prolapse treatment is accomplished in various situations. All previous research indicate that surgery aims to maximise patient satisfaction and return the pelvic organs to their original positions.

Keywords: Pelvic organ prolapse, sacrocolpopexy, uterosacral ligament suspension, hysterectomy.

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Introduction

Pelvic organ prolapse (POP) is a general term that refers to various disorders, including the uterine prolapse [1]. Pelvic floor dysfunction is influenced by a woman's lifetime interactions with anatomical, reproductive, lifestyle, genetic, and physiological factors. Numerous studies have found a connection between correspondence and a high prevalence of POP [2]. Due to the weakening of the endopelvic ligaments, particularly the transverse ligaments, the uterus descends into the vagina. Vaginal prolapse, anterior wall prolapse or cystocele, posterior wall prolapse or rectocele, and uterine prolapse are all examples of POP [1]. Many women with symptomatic POP experience emotional and physical anguish, negatively impacting their social, psychological, and physical well-being [3]. The outcomes of the various surgical repair procedures for uterine prolapse remain variable. They present a challenge in clinical practice. Uterine prolapse is currently treated through vaginal hysterectomy. However, its use is not evidence-based, and it is uncertain if removing or keeping the uterus is better [4]. Furthermore, there is a significant evidence that hysterectomy does not benefit women with uterine prolapse compared to uterine-preserving techniques [5]. Numerous randomised controlled trials (RCTs) comparing the safety and efficacy of hysteropreservation versus hysterectomy in women with uterine prolapse have already been performed; however, conflicting results have been reported [6,7]. So it is critical to determine the best surgical technique for women with uterine prolapse [4].

Research Problem

There are many options for managing POP (conservative and surgical management). Physicians can not easily determine the best choice regarding the prolapse type and severity.

Research Focus

Comparing the options for the prolapse treatment, especially the surgical options, determine the best treatment method regarding the severity of the prolapse.

Research Questions

1. What are different types of prolapse?
2. Does POP have different degrees of severity?
3. What is the difference between conservative and surgical management?
4. What is the best treatment option regarding the degree of POP?

Research Aim

This review was performed in order to evaluate the treatment options for prolapse depending on the type of prolapse and its degree.

Research Methodology

In this review, English studies from common databases such as Pubmed/MEDLINE, Web of science, Scopus, and the Cochrane Library with the keywords "pelvic organ prolapse," "uterine prolapse," "vaginal hysterectomy," combined with keywords, involving "laparoscopic hysterectomy were involved." The end date for this review is February 2022. The studies that were found using each set of keyword combinations were then pooled to create an impartial collection of publications. Studies and/or articles that weren't subjected to peer review, as well as proposals, procedures, reviews, letters, and opinions, were eliminated. The references include publications that were chosen because they are related to the topic. One concentrated on providing an overview of treatment options for prolapse depending on the type of prolapse and its degree.

Research Results

The result of the search using this search strategy was 2200 articles. One screened these articles to choose those related to the topic. A full-text screening of 280 articles after excluding the remaining article by title and abstract screening was done. Finally, 50 articles in order to gather information about the topic and to write this review were used (Figure 1).

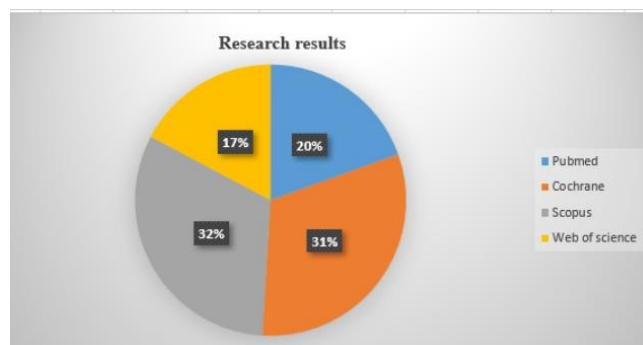


Figure 1. Research results

Literature review

Types of prolapse

POP is classified according to the prolapsed organ. Vaginal vault prolapse refers to the descent of the uterus, vaginal apex, or cervix. Cystocele suggests anterior wall herniation, and rectocele suggests posterior wall descent (Figure 2) [8,9].

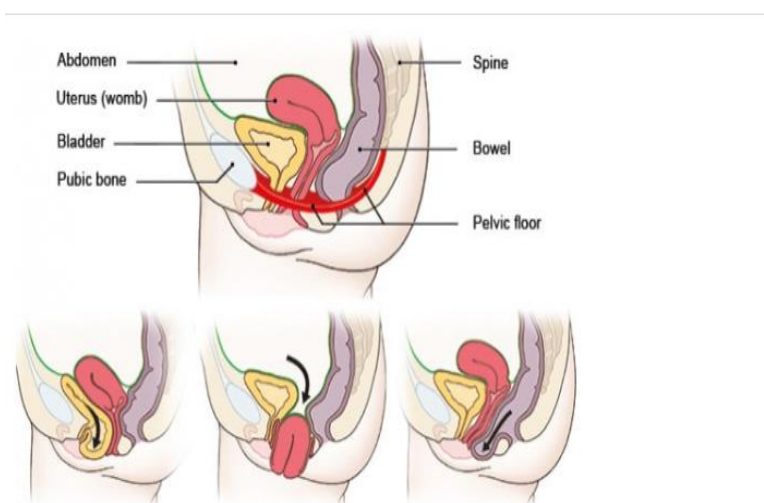


Figure 2. Above normal anatomy of organs in the abdomen; below right: posterior vaginal prolapse (rectocele), middle: uterine prolapse, left: bladder prolapse [10].

Uterine prolapse

Uterine herniation from its normal anatomical place into the vaginal canal via the hymen or the introitus of the vagina is known as uterine prolapse. This is because the surrounding support structures have weakened. Uterine prolapse is also known as genital prolapse and POP. Uterine prolapse is the most common type of POP [11,12].

Pathophysiology and risk factors

Although POP is very common, little is known about its aetiology. There are various risk factors for POP, such as hysterectomy, obesity, vaginal delivery, chronic constipation, chronic obstructive pulmonary disease, high-impact exercise, Ehler-Danols syndrome, and Marfan syndrome. The POP risk increased 4-fold following the first vaginal delivery, 8-fold following the second delivery, and 9-fold following the third delivery, demonstrating an elevated risk of POP following several vaginal deliveries. One of the main risk factors for POP is aging [13,14]. According to the research of about 1,000 females in the United States, the risk of POP increased by almost 40% every ten years of age. Women who are obese or overweight are more likely to develop POP than women who are of a healthy weight. According to a review of 22 studies, the chance of having POP increased by almost 40% to 50% in obese and overweight women compared to normal-weight women [13,14].

Clinical manifestations

The majority of patients who present uterine prolapse are asymptomatic. The most prevalent symptom of patients with uterine prolapse is the sensation or visualisation of a bulge in the vaginal region, accompanied by vaginal pressure. Other symptoms involve dyspareunia, the feeling of incomplete bladder emptying, and increased urinary frequency or urgency. When the prolapse develops, the symptoms will gradually start to appear and may get worse over time [15]. It has been demonstrated that when the prolapse's severity worsens, the number and intensity of the symptoms also rise. However, particular symptoms of the patients do not correlate well with the prolapse stage. In addition to patient complaints, the pelvic exam plays a critical role in diagnosing uterine prolapse since it allows for the clear visibility of the prolapsed section. The patient should undergo a pelvic examination while at rest and performing the Valsalva manoeuvre. Staging involves seeing the prolapsed section in relation to the hymen or introitus [16].

Diagnosis

A woman with a POP frequently visits the doctor with bladder issues or generalised abdominal pain. Vaginal examination can already diagnose severe conditions. The doctor examines the vagina with a device known as a speculum and feels the abdominal organs with their hands, both from inside the vagina and from the outside (belly), to detect milder cases. The anus can be examined to feel where the organs are located in the back of the pelvis. These examinations are typically enough to detect a prolapse and assess its severity [17,18].

Stages

The Pelvic Organ Prolapse Quantification (POP-Q) system was used to stage uterine prolapse [19]. Measurements proximal to the hymen are denoted by negative numbers, while measurements distal to the hymen are represented by positive numbers, with the hymen as a reference point of "0". This method only considers the location of the most distal part of the prolapsed segment in relation to the hymen. While the patient is undergoing the Valsalva technique, measurements are taken (Figure 3).

- Stage 0: no visible prolapse.
- Stage 1: the most distal part of the prolapsed segment is >1 cm above the level of the hymen.
- Stage 2: the most distal part of the prolapsed segment is >1 cm or less distal or proximal to the hymen.
- Stage 3: the most distal part of the prolapsed segment protrudes >1 cm below the hymen but 2 cm less than the total length of the vagina.
- Stage 4: complete eversion of the vagina [20].

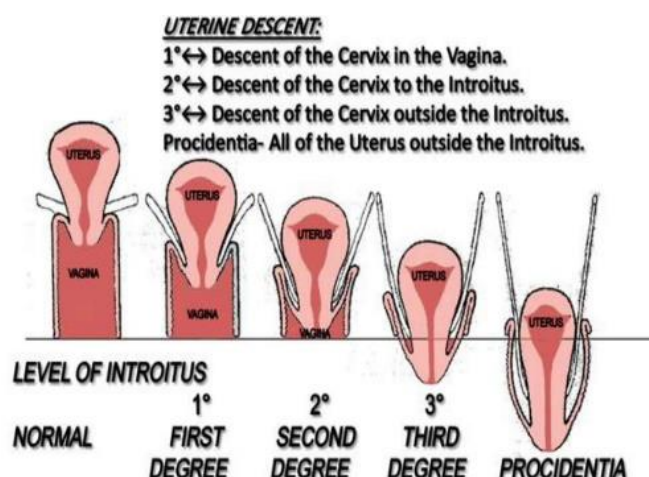


Figure 3. Staging of uterine prolapse [20].

Prevention

Although there are modifiable risk factors for POP, little information is available regarding the effectiveness of appropriate therapies for its prevention. POP is more prevalent among women who have had several pregnancies, difficult deliveries, or large babies. Several factors push down the organs of the pelvis against the pelvic supports. Most of these factors are operative. The failure of the levator ani muscles, the major component of the pelvic diaphragm, is critical in mediating the influence of these factors on pelvic organ support [21].

The most significant risk factor for POP is vaginal delivery, but not all women can avoid this. However, women at

high risk for prolapse can be given the option of an elective cesarean section. This risk could be evaluated using variables such as fetal weight over 4 kg, urinary incontinence predating pregnancy, body mass index (BMI), maternal height less than 160 cm, and younger age at first vaginal delivery [22].

Several techniques can help decrease pelvic floor pressure and reduce the risk of POP. For example, frequent pelvic floor exercises (Kegel exercises) have been proposed to avoid prolapse by enhancing pelvic muscle supports [23].

Treatment

Depending on the patient's age, coital function and desire for future fertility, the severity of their symptoms, and any coexisting medical conditions, surgical or conservative management may be indicated. The compartment of descent also influences treatment. Symptomatic relief, sexual function improvement or maintenance, the restoration of sufficient pelvic support, and the avoidance of incontinence and new support defects are among the objectives of management [24].

Observing and closely following up on women with mild, asymptomatic cases is appropriate. In most cases, symptoms don't appear until the protrusion extends past the opening of the vagina [25]. POP is managed when protrusion, sexual, bowel, urinary dysfunction, and other symptoms are present. Asymptomatic POP patients usually don't need treatment. In symptomatic patients, surgical or conservative management is used, and the patient's preferences determine treatment options [13].

Table 3. Comparison between the conservative and surgical management of POP

Aspect	Conservative Treatment	Surgical Management
Goal	To improve symptoms and quality of life without surgery	To correct the anatomical defect and improve symptoms
Effectiveness	Varies depending on the severity of prolapse and individual response to treatment	Generally effective in correcting the anatomical defect and improving symptoms
Risks/Complications	Minimal, but may not be effective for severe cases or may require ongoing treatment	Risks associated with surgery, such as bleeding, infection, and anesthesia
Recovery Time	Immediate relief of symptoms, but ongoing treatment may be required	Recovery time varies depending on the type of surgery performed but typically involves several weeks of limited activity and restrictions on lifting or strenuous activity
Cost	Generally less expensive than surgery, but ongoing treatment costs may add up over time	Surgery can be expensive, especially if multiple procedures are required
Long-term outcomes	It may not provide a permanent solution for severe cases or those with underlying conditions that contribute to prolapse (such as obesity or chronic cough)	Surgery can provide a permanent solution for many women, but there is a risk of recurrence over time

Conservative treatment

Conservative care is helpful for individuals at high risk for complications and recurrence following surgical treatment or who refuse surgical procedures. Pessaries, hormone therapy, pelvic floor muscle exercises, and other treatments are available [13]. Kegel exercises for strengthening the pelvic floor allow the levator ani muscles to be contracted systematically. Kegel exercises are effective for women with mild POP and have been shown to reduce the symptoms of mixed incontinence and stress urge [26].

Two-thirds of patients with symptomatic POP decide to use a pessary for therapy, and up to 77% will keep using it after a year [27]. Vaginal pessaries are a conservative treatment option for POP that has been made available, primarily to women who plan to try for a new pregnancy (as a temporary solution) and for those who are not good surgical candidates or do not want to have POP surgery. According to estimates, over two-thirds of women with symptomatic POP decide on the pessary as their first course of treatment. Using the pessary reduces prolapse, intestinal, and urinary symptoms, improving quality of life. The most frequent and mildest complications are

increased vaginal discharge and vaginal erosion, which can be successfully managed with targeted therapy such as vaginal estrogen therapy [28,29].

Under 65-year-old women, those with a history of pelvic reconstructive surgery or hysterectomy, posterior vaginal wall prolapse, and those with these conditions are more likely to be intolerant of the pessary after first insertion, either due to pain or due to their expulsion [16,30].

Surgical management of POP

There is no statistical data that evaluate the rates of the most frequently performed major gynecological procedures and their outcomes in Kazakhstan healthcare settings in the published sources that are currently available. The number of gynecological procedures performed in Kazakhstan has been the subject of a tiny number of reports [31]. Surgical management of POP involves repairing the weakened pelvic floor muscles and supporting structures to restore normal anatomy and function. Several surgical approaches are available depending on the severity of the prolapse, the patient's age, and overall health status. These include vaginal surgeries like anterior/posterior colporrhaphy or sacrospinous ligament fixation (SSL) and laparoscopic surgeries like sacrocolpopexy or robotic-assisted laparoscopic surgeries [32].

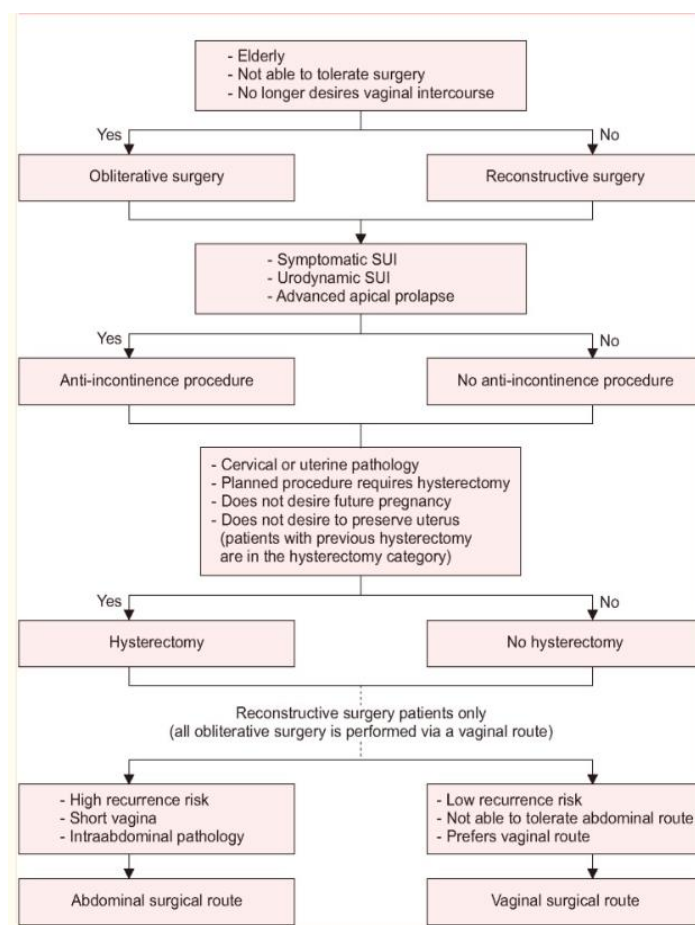


Figure 4. Choosing a primary procedure for pelvic organ prolapse [13].

Surgical management of anterior pelvic prolapse

The choice of surgical technique depends on factors such as patient preference, surgeon experience, expertise, anatomical defects present in each case, etc. Surgery aims to provide long-lasting relief from symptoms while minimising risks and complications associated with surgery [33].

As there is no established surgical protocol for treating anterior prolapse, it is essential to go over the advantages and disadvantages of each surgical approach with each patient. Several native procedures have been devised to augment tissue further and increase its durability. However, placing sutures that plicate is still the standard method for reconstructing the anterior vaginal wall. Although native tissue healing has a lower success rate than mesh-augmented repair, native repair helps minimize prolapse inside the vagina and treat symptoms of the vaginal bulge [34].

The several surgical options for treating anterior POP include; Anterior colporrhaphy, a traditional surgical

technique that involves making an incision in the vaginal wall and repositioning the prolapsed tissues back into their normal position. The surgeon then sutures the vaginal wall to reinforce it [35].

Mesh-augmented repair involves using a synthetic mesh material to reinforce the weakened tissues. The mesh is inserted through small incisions in the vagina or abdomen and secured with sutures. Using the meshes for POP repair is associated with several safety concerns [36]. Unfortunately, the observed adverse effects are related to permanent morbidity and are very difficult to manage. Since then, improvements in mesh development, such as modified composition, improved design, and lower mesh densities, have been identified as variables that greatly reduce the risks of these adverse events, in addition to surgeon expertise and improved patient selection. Since then, improvements in mesh development, such as modified composition, improved design, and lower mesh densities, have been identified as factors that greatly reduce the risks of these adverse events, in addition to surgeon expertise and improved patient selection [37].

Vaginal hysterectomy with anterior repair: In cases where the uterus is also prolapsed, a vaginal hysterectomy may be performed along with an anterior repair to correct both conditions at once [38].

Laparoscopic or robotic-assisted sacrocolpopexy: This minimally invasive procedure involves attaching a synthetic mesh to the top of the vagina and anchoring it to strong ligaments in the pelvis to support the prolapsed organs. This condition can cause discomfort, pain, and urinary or bowel problems. Sacrocolpopexy is considered one of the most effective treatments for pelvic organ prolapse and involves using a mesh to support the prolapsed organs. Traditionally, sacrocolpopexy was performed through an open abdominal incision. However, with advances in technology and surgical techniques, laparoscopic and robotic-assisted approaches have become increasingly popular. These minimally invasive procedures involve making small incisions in the abdomen and using specialised instruments to perform the surgery with greater precision and less trauma to surrounding tissues [34].

Laparoscopic or robotic-assisted sacrocolpopexy offers several advantages over traditional open surgery, including shorter hospital stays, less pain and scarring, faster recovery times, and reduced risk of complications such as infection or bleeding. Additionally, these procedures allow for better surgical site visualization and greater accuracy in placing the mesh support [39].

Surgical management of apical pelvic prolapse

Apical prolapse procedures are widely classified as obliterative or restorative. Restorative procedures might be carried out either transvaginally or abdominally. Abdominal sacrocolpopexy is the gold standard for patients seeking rehabilitative solutions. Abdominal sacrocolpopexy can be done via a laparotomy, traditional laparoscopic sacrocolpopexy (LSC), or robot-assisted-laparoscopic sacrocolpopexy (RSC). Compared to laparoscopic sacrocolpopexy, open sacrocolpopexy is an excellent therapeutic option for apical prolapse repair, with long-term success rates ranging from 78% to 100%. However, it is associated with a longer hospital stay, more analgesics, and a higher cost. New surgical procedures such as LSC or RSC have been developed to overcome these difficulties. LSC or RSC reduces overall morbidity and has high anatomical durability compared to open sacrocolpopexy. A randomized study comparing open sacrocolpopexy with LSC in patients with vault prolapse discovered that the procedures had clinically identical recurrence rates at one year [40]. Costantini et al. [41] conducted the most extended randomised follow-up trial (mean follow-up of 41.7 months) comparing LSC versus open sacrocolpopexy in 2016. They discovered that both treatments are effective, with no patients in their sample reporting apical recurrences.

While LSC appears to solve the drawbacks of open sacrocolpopexy, it is technically more difficult for people inexperienced with laparoscopy. Since its introduction in 2004, RLC has enabled surgeons with high dexterity and precision to offer surgery as an alternative to LSC. Van et al [42] performed a multicentric clinical trial that compared open sacrocolpopexy with laparoscopic sacrocolpopexy. They discovered that both procedures showed comparable results on the quality of life, anatomical results and safety outcomes through a long period of follow-up that reached 9 years. RSC, which reduces the difficulty of laparoscopic knot tying and aids sacral dissection with 3-dimensional visualization, has quickly grown in favour as a means of reducing the morbidity related to open sacrocolpopexy.

Surgical management of posterior pelvic prolapse

Posterior vaginal wall prolapse might cause the sense of mass bulging into the vagina and the symptoms of difficult defecation. Because it frequently occurs in conjunction with anterior or apical prolapse, it is uncertain how common posterior compartment prolapse alone is it. The prevalence of rectocele could be underestimated because up to 80% of cases are asymptomatic [43].

The surgical management of posterior pelvic prolapse involves a range of procedures that aim to repair or reconstruct the damaged tissues and muscles in the pelvis. These procedures can be performed through various approaches, including vaginal, laparoscopic, or open surgery. The choice of the approach depends on several factors such as the severity of the prolapse, patient preference, and surgeon expertise [44].

Laparoscopic-assisted vaginal hysterectomy for management of POP

Laparoscopic-assisted vaginal hysterectomy (LAVH) is one surgical option for treating POP. This minimally invasive procedure involves removing the uterus through small incisions in the abdomen and vagina while using a laparoscope to visualize the pelvic organs. LAVH has become increasingly popular in recent years due to its numerous benefits over traditional open surgery, including reduced blood loss, shorter hospital stays, faster recovery times, and less scarring [45].

During LAVH for POP treatment, the surgeon will first make several small incisions in the abdomen to insert a laparoscope and other specialised instruments. The laparoscope provides a high-resolution view of the pelvic organs and allows the surgeon to manipulate them from outside of the body. Next, an incision is made in the vagina to remove the uterus and any other prolapsed organs. The surgeon will then use sutures or mesh to repair any damaged tissues or ligaments that support the pelvic organs [46].

Overall, LAVH is a safe and effective treatment option for women with POP who require surgery. However, like any surgical procedure, it does carry some risks such as bleeding or infection. Therefore, patients must discuss all their options with their healthcare provider before making any decisions about treatment for their POP

Discussion

POP is a condition when one or more pelvic organs, such as the uterus, the bladder, or the rectum, descend into the vaginal canal due to weakened pelvic floor muscles. The severity of POP can vary from mild to severe, and treatment options depend on the degree of prolapse. The improvement in the quality of life and patient satisfaction are considered the main factors in assessing the success of POP surgery [13]. Significantly, the postoperative absence of vaginal prominence symptoms is related to an overall improvement in quality of life after surgery [47]. Numerous randomised trials have investigated symptomatic success using a variety of indicators, such as the absence of symptoms associated with a vaginal prominence and various forms of validated questionnaires. Regarding the anterior POP, the vaginal prominence symptoms were used to measure symptomatic success, symptoms persisted in 0% to 37.9% of patients after anterior colporrhaphy and 5% to 24.6% of patients following mesh repair. According to a Cochrane review of anterior compartment prolapse, the mesh repair significantly reduced the likelihood of prolapse awareness compared to anterior colporrhaphy [48]. However, most quality-of-life surveys indicated considerable improvement following both procedures, with no significant improvement between AC and mesh repair [49].

Concerning apical prolapse, according to a recent Cochrane analysis [48], open or laparoscopic sacrocolpopexy was related to a decreased incidence of prolapse awareness, repeat surgery for prolapse, postoperative stress urine incontinence, and dyspareunia than a variety of vaginal procedures.

When comparing the supracervical hysterectomy with sacrocolpopexy, a retrospective study showed that supracervical hysterectomy with sacrocolpopexy was associated with 2.8 more incidences of recurrent prolapse than total hysterectomy with sacrocolpopexy [50].

Regarding the posterior pop, a randomised trial by Paraiso et al. compared the results of 3 different rectocele repair procedures (posterior colporrhaphy, site-specific repair enhanced with a small pig intestine submucosal graft, and site-specific repair). They reported that the patient managed with graft augmentation experienced more anatomical failure than those who received posterior colporrhaphy or site-specific repair [51]. In 2018, a recent Cochrane review included 1099 women from 10 clinical trials. They found that in view of both objective and subjective measurements, transvaginal repair for posterior wall prolapse may be more successful than transanal repair in avoiding prolapse recurrence [44].

Conclusions and Implications

1. Treatment options for pelvic organ prolapse depend on its severity.
2. Grade 1 POP: Grade 1 POP is mild and usually requires no treatment. However, women with grade 1 POP may benefit from pelvic floor exercises in order to strengthen their muscles and prevent further prolapse.
3. Grade 2 POP: Grade 2 POP is moderate and may cause discomfort or pressure in the vagina. Treatment options for grade 2 POP include:
 - 3.a Pessary: A pessary is a small device that is inserted into the vagina to support the pelvic organs. It can be regularly removed and cleaned.
 - 3.b. Pelvic floor exercises: Pelvic floor exercises can help strengthen the muscles that support the pelvic organs.
 - 3.c. Surgery: Surgery may be recommended for women with grade 2 POP who have symptoms that affect their quality of life or who do not respond to other treatments.

4. Grade 3 POP: Grade 3 POP is severe and may cause significant discomfort or pain. Treatment options for grade 3 POP include:

4.a. Pessary: A pessary may be used to support the pelvic organs.

4.b. Surgery: Surgery is usually recommended for women with grade 3 POP who have symptoms that affect their quality of life or who do not respond to other treatments.

5. Grade 4 POP, including:

5.a. Vaginal hysterectomy: This procedure involves removing the uterus through an incision in the vagina.

5.b. Sacrocolpopexy: This procedure involves using mesh material to support the prolapsed organs and attaching it to a ligament in the pelvis.

5.c. Colpocleisis: This procedure involves closing off a part of the vaginal canal to support prolapsed organs.

5.d. Uterosacral ligament suspension: This procedure involves reattaching ligaments in the pelvis that support the uterus.

Declarations

Author contributions

All authors have sufficiently contributed to the study and agreed with the results and conclusions.

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Ethical statement

This study does not require IRB approval as it does not involve human subjects/data.

Declaration of interest

No conflict of interest is declared by authors.

Data sharing statement

Data supporting the findings and conclusions are available upon request from the corresponding author.

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