

SURGICAL REPAIR OF THE POSTERIOR COMPARTMENT DEFECTS – LITERATURE REVIEW

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ABSTRACT

The posterior compartment of the vagina comprises the zone from the cervix until to the perineal body where different key structures, which contain connective tissue, can be deteriorated as a result of a trauma (e. g complicated vaginal birth), previous hysterectomy or an increased body mass index. These structures include the uterosacral and cardinal ligaments, the rectovaginal fascia (RVF) and the perineal body (PB), all of them playing also an important role in the pathophysiology of other vaginal wall disorders (anterior and/or median vaginal defects). However, the grade of connective tissue disruption seems not to be correlated with the severity of the dysfunction. A posterior vaginal defect exteriorizes itself in the form of a rectocele, enterocele or sigmoidocele and it generally requires surgical repair when symptomatic with impact on the patient's daily activities. The role of this review is to make a review of the literature regarding the possible transvaginal approaches to the posterior compartment defects, and namely the posterior colporrhaphy and repair of the RVF with or without grafts, focusing on the technique, success and recurrence rates of the different

RÉSUMÉ

Réparation chirurgicale des défauts vaginaux postérieurs – revue de la littérature

Le compartiment postérieur du vagin comprend la zone allant du col de l'utérus jusqu'au corps périnéal où différentes structures clés, qui contiennent du tissu conjonctif, peuvent être détériorées à la suite d'un traumatisme (par exemple un accouchement vaginal compliqué), une hystérectomie ou chez les sujets ayant un indice de masse corporelle augmenté. Ces structures comprennent les ligaments utéro-sacraux et cardinaux, le fascia recto-vaginal (RVF) et le périnée (PB), tous jouant également un rôle important dans la physiopathologie des autres affections de la paroi vaginale (défauts vaginaux antérieurs et/ ou médians). Cependant, le degré de perturbation du tissu conjonctif ne semble pas être corrélé avec la gravité du dysfonctionnement. Les défauts vaginaux postérieurs s'extériorisent sous la forme d'une rectocèle, d'une entérocele ou d'une sigmoïdocèle et nécessitent généralement une réparation chirurgicale lorsqu'ils sont symptomatiques et ont un impact sur les activités quotidiennes du patient. Le rôle

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methods as well as the reasons to choose between different therapeutic options.

Key words: posterior compartment, rectocele, prolapse, rectovaginal fascia.

Abbreviations: RVF= rectovaginal fascia; PB= perineal body

INTRODUCTION

A defect of the posterior vaginal wall is most often accompanied by disorders in the vaginal apex and/or the anterior and/or the median compartment and it generally produces an anterior herniation of the rectum in form of a rectocele, sigmoid colon as a sigmoidocele or the small bowel as an enterocele¹. The most important structure of the posterior compartment is the rectovaginal fascia (RVF) which distally connects the posterior vaginal wall to the perineal body (PB) and cranially to the muscles of the levator plate². The contraction of the levator plate opposes to the PB and stretches the PVW which is now horizontally orientated^{2,3}. An intact RVF, uterosacral and cardinal ligaments, as well as an efficient contraction of the levator plate, prevents the herniation of the posterior wall of the rectum in the vagina, while the deterioration of the connective tissue of the proximal part of the RVF will cause an enterocele². Among the most significant etiological factors for the posterior defects worth to be mentioned are: obstetrics complications with traumatic births, menopause with associated atrophy and laxity of the vaginal mucosa and pelvic ligaments and overweight or obesity^{2,3}. However, an advanced grade of a posterior prolapse does not automatically imply more oppressive symptoms such as severe pelvic pains, constipation or dyspareunia⁴. On the other side, disorders of the RVF can induce an insufficient posterior traction of the anterior rectal wall, causing difficulties with defecations or sexual dysfunction⁵. A constant impairment of the defecatory function increases the rectal pressure and loosens the attached ligaments to the RVF and progressively creates „tears“ in the RVF.

The key part of the surgical treatment of the posterior defects is the restoration of the RVF, and namely site-specific repairs of the defects, as well as a strengthening of the posterior vaginal wall^{2,6}. The surgical treatment is aimed at reestablishing the normal anatomy of the pelvic floor by repairing the connective tissue of the supporting structures, with lower

de cette revue est de revoir la littérature concernant les approches transvaginales possibles des défauts du compartiment postérieur, et notamment la colporrhaphie postérieure et la réparation de la FVR avec ou sans greffe, en mettant l'accent sur la technique, le succès et les taux de récurrence des différentes méthodes ainsi que les raisons de choisir entre différentes options thérapeutiques.

Mots-clé: compartiment postérieur, rectocèle, prolapsus, fascia recto-vaginal.

complications and recurrence rates and as high as possible outcome rates. The choice between different surgical techniques should be particularized on each patient, with the aim to relieve the symptoms and improve the life quality⁷. The purpose of this article is to review the current literature on the surgical approaches of the symptomatic posterior compartment defects, analyzing the efficiency, advantages and limits of the traditional versus modern surgical techniques, as well as to present the reported outcomes after using reconstructive materials, either synthetic or biologic. The surgical outcomes are generally presented in terms of success and failure rate, which in turn are defined after analyzing the questionnaires on satisfaction and life quality and the staging of prolapse based on the Pelvic Organ Prolapse Quantification System (the POP-Q system).

REPAIR OF THE RVF AND THE USE OF RECONSTRUCTIVE MATERIALS

As mentioned above, an increased pressure in the rectum loosens the RVF and produces specific tears in connective tissue which are clinically diagnosed as defects of the proximal, lateral, median or distal part of the posterior vagina wall. These defects will progressively determine the prolapse of the rectum in the vagina⁸. Specific repairs of these defects, also known as site-specific defect repair, have been reported to have success rates between 82% and 100%. These success rates refer to a significant improvement of the sexual and bowel function, as well as pelvic pressure or splinting⁹. The highest postoperative complication has been showed to vary between 2% and 11% and implied a newly diagnosed dyspareunia⁹. Compared to the traditional surgical technique for rectocele repair- the posterior colporrhaphy - a comparative review reported though a higher recurrence rate in the group of women who had undergone the site-specific repair, but similar postoperative complication rates¹⁰.

Moreover, some reports also showed a significant lower intra- and postoperative morbidity rate, a

reduced length of hospital stay and a reduced recurrence rate¹¹⁻¹³. With regard to the surgical technique, a site-specific fascia repair begins with the incision and dissection of the epithelium of the posterior vaginal wall above the rectocele, with extension of the tissue dissection from the mucosa and muscular layer towards the arcus tendinous of the pelvic and rectovaginal fascia¹⁴. The defects of the fibro-muscular layer can be easier observed during concomitant rectal examination and then closed using absorbable interrupted sutures. Further, a mild perineorrhaphy should be performed aiming at lengthening the posterior vaginal wall and reducing the risk of postoperative dyspareunia¹⁵.

Apart from the benefits of specifically repair of the RVF, there is evidence for using mesh or a graft for the correction of a posterior defect, with significantly better outcomes compared to the techniques that use native tissues¹⁶. The meshes can strengthen either the fibromuscular layer or the corrected defects (“tears”) of the RVF and fixed in a tension free manner bilaterally to the endopelvic fascia, proximally to the apex and distally to the PB¹⁶. The reported success rates associated to the use of grafts or meshes vary between 76% and 88%^{16,17}, while the recurrence rate has been reported to be 7.4% compared to 11.7% when performing a native tissue repair^{18,19}. However, larger comparative trials²⁰ did not achieve to prove significant arguments for the use of grafts or meshes, the unsatisfactory results being probably due to the complications induced by the use of the mesh. Consequently, higher recurrence rates and other complications, such as delayed wound healing after applying grafts of acellular collagen matrix, have also been reported²¹. Furthermore, when it comes to commercial mesh kits, there is in the literature a paucity of data in favor of their utility^{7,22}. The surgical outcomes after using graft augmentation in the treatment of symptomatic POP have been presented by the Society of Gynecologic Surgeons Systematic Review Group¹⁷, which stated that an improvement of the intestinal symptoms has been demonstrated, however currently there are insufficient data on the efficiency of the reconstructive materials, so that they have not been implemented in the routine clinical practice.

TRADITIONAL SURGICAL METHODS

One of the most performed surgical method for posterior prolapse is the posterior colporrhaphy, which is based on the principle of decreasing the caliber of the vaginal tube by folding towards medially the posterior vaginal mucosa and the muscle levator ani. The excess of the vaginal mucosa will be removed, the muscle and the rest of the vaginal mucosa

are closed with absorbable sutures, the width of the introitus being established by taking into account the sexual activity of the woman²³. Further, a perineorrhaphy is also performed. With regard to the surgical outcomes of the posterior colporrhaphy, a success rate of 76%-96% has been reported²⁴. Retrospective observational studies^{25,26} have demonstrated no significant improvement of the symptomatology with respect to anal incontinence, constipation or pelvic pain, as well as a severe dyspareunia. Moreover, after colporrhaphy, the rate of de novo dyspareunia has been observed in approximately 20% of patients²⁵. Other studies²⁶ reported a newly diagnosed dyspareunia in 8% of cases, however an important decrease in the number of patients reporting bulging symptoms or constipation. In other traditional surgical methods, such as posterior colporrhaphy with Burch procedure, the rate of dyspareunia reached 38%²⁷. When the posterior colporrhaphy did not imply folding of the levator ani muscle, objective success rates (based on the POP-Q system) of 87% and 79% at 12 months and 24 months, respectively, have been reported²⁸. Furthermore, compared to other reports^{25,26}, significantly less women reported a defecatory dysfunction, and namely 13%, while the subjective success rate (based on the satisfaction questionnaire) reached 98%, which means that the plication of the levator ani muscle should be avoided in women with obstructive defecatory symptoms³⁰. Compared to the technique of specific repair of the RVF in women with symptomatic rectocele, the posterior colporrhaphy is associated with significantly poorer functional outcomes – reduced subjective and objective success rates – and an increased recurrence rate, which transforms it in an unpopular surgical technique.

Another method of rectocele repair is the abdominal sacral colpopexy, which is actually more suitable for apical defects, but it can be also applied in women with symptomatic rectocele. The technique uses two meshes placed on the anterior and posterior vaginal wall and helps attaching the apex of the vagina to the anterior longitudinal sacral ligament, below the sacral promontory. In this way, the vaginal axis will be placed horizontally, reducing the risk of recurrence³¹. The method has been most often performed through a laparotomy, however, in recent years, laparoscopic or robot-assisted laparoscopic procedures are more frequently performed. The objective success rate varies between 76% and 100%, while the recurrence rate has been reported to be 2%-26%³². When it comes to the symptomatology, the abdominal sacral colpopexy, with or without concomitant posterior repair, resulted in a significant improvement of the obstructive defecatory symptoms, sexual function, fecal incontinence and anorectal pain³³. The rate of complications

related to the use of the synthetic multifilament mesh has been estimated at 10.5%, probably due to their multifilament constitution which is known to be associated with an increased risk of erosion³⁴.

The use of the iliococcygeal fascia for apical suspension can also help the correction of a rectocele and is theoretically similar to the technique of sacrospinous ligament suspension. It is associated with a lower risk of intraoperative morbidity and namely the lesion of the pudendal nerves and blood vessels compared to the sacrospinous fixation³⁵. The subjective success rate is approximately 91%, which makes it a reasonable choice for posterior defects repair. However, it is primary preferred for apical defects³⁶.

CHOOSING BETWEEN THE THREE MAIN TRANSVAGINAL METHODS

There is a huge information on the surgical outcomes of the transvaginal methods for posterior defects, the majority of data showing similar success rates for posterior colporrhaphy and site-specific defect repair of the RVF, while the graft augmentation is generally associated with unsatisfactory results, probably due to the mesh-associated complications, especially graft rejection and erosion³⁷. These statements were presented by Paraiso and coworkers³⁸, who conducted a randomized trial on the three surgical techniques randomly applied on 106 patients with posterior defects. The posterior colporrhaphy and the site-specific defect repair were better than the techniques that incorporate grafts in terms of recurrence. A reduction in the voiding, straining and splinting symptoms has been observed in all of the three groups. Furthermore, all of the three techniques produced an improvement of the sexual activity, the median rate of postoperative dyspareunia for all of the three groups being 30%³⁸.

The rate for posterior prolapse after using graft augmentation has been 20% compared to 7.4% and 7.1% when the site-specific defect repair and the posterior colporrhaphy. Moreover, women who received reconstructive materials developed earlier prolapse compared to those who received one of the other two techniques. In the same way, a postoperative increase of the symptomatology has been observed to appear in 21% of women who received reconstructive materials, compared to 12% and 16% for site-specific repair and posterior colporrhaphy respectively³⁸.

Summarizing the huge amount of results, it can be stated that the site-specific defect repair of the RVF and the posterior colporrhaphy are superior to the graft materials in terms of recurrence of the rectocele, while all of the three techniques result in a similar improvement of the bowel function, sexual

activity and life quality. However, the relative high rate of graft –associated complication represents a serious complication which impairs the use of the grafts in the routine clinical practice.

CONCLUSIONS

A posterior compartment defect, which most frequently manifests as a rectocele, can be resolved using either a standard posterior colporrhaphy or a site-specific defect repair of the FRV, the reported objective success rates being 76%-96% and up to 100%, respectively, with better results in terms of defecatory and sexual function, as well as recurrence rate for the site-specific defect repair of the RVF. The traditional method – the abdominal sacral colpopexy and iliococcygeal fascia suspension are primarily designed for apical defects, but may be applied to correct a rectocele either in addition to the posterior colporrhaphy or site-specific defect repair or as a single method to correct both the apical and the posterior defect. Plication of the levator ani muscle significantly increases the risk for de novo dyspareunia. Graft materials are generally associated with a high rate of graft-rejects or erosion, as well as a high recurrence rate.

Compliance with Ethics Requirements:

„The authors declare no conflict of interest regarding this article“

„The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law.“

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