



Transvaginal Apical Repair with Native Tissue: Sixty Months of Experience

Correção de Prolapso Apical Via Vaginal com Tecidos Nativos: Sessenta Meses de Experiência

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Abstract

Introduction: Our objective was to evaluate success and complication rates of different techniques of transvaginal correction for apical prolapse using native tissues.

Material and Methods: Retrospective study of 41 transvaginal apical prolapse repair using native tissues, performed by the Urogynecology Department of a tertiary hospital, from January 2013 to June 2018.

Results: In our sample, mean age was 66 years; all women were multiparous and 95.1% were postmenopausal. Regarding past surgical history 47.5% had a previous hysterectomy and 17.5% an anterior, 10.0% a posterior and 7.5% an apical prolapse repair. On clinical examination, in addition to apical prolapse, 24.4% presented prolapse of the anterior compartment, 4.9% of the posterior compartment and 53.7% of both. Surgical apical prolapse correction was performed with transvaginal uterosacral ligament suspension in 22.0% of cases, sacrospinous ligament fixation in 68.3% and iliococcygeus fixation in 9.8%. At the same surgical session, 39.0% underwent vaginal hysterectomy (with anterior and posterior colporrhaphy in 7/16, anterior repair in 4/16 and posterior repair in 3/16 cases), 7.3% had anterior compartment repair, 2.4% posterior compartment repair and in 36.6% both compartments were repaired. During the perioperative period there were no reported complications. Therapeutic success was observed in 82.9%. Clinical apical prolapse recurrence occurred in 17.1% and 4.9% had recurrence of other types of prolapse. It was reported a case of urge incontinence and two cases of fistulas. In 34.1%, these complications occurred in the first 6 months after surgery. There was no statistically significant difference concerning either the success or the occurrence of complications between the three different techniques of apical prolapse repair.

Conclusion: The use of native tissues to correct apical prolapse was an effective and safe method with low morbidity. In this study all of the techniques of apical repair were equally effective suggesting that surgeon's experience must be considered when deciding which procedure to perform.

Keywords: Gynecologic Surgical Procedures; Pelvic Organ Prolapse/surgery; Vagina/surgery; Reconstructive Surgical Procedures

Resumo

Introdução: O objectivo do estudo foi avaliar a taxa de sucesso e as complicações associadas a diferentes técnicas de correção transvaginal de prolapso apical, recorrendo a tecidos nativos.

Material e Métodos: Estudo retrospectivo de 41 cirurgias vaginais para correção de prolapso apical com tecidos nativos, realizadas no Departamento de Uroginecologia de um hospital terciário, de janeiro/2013 a junho/2018.

Resultados: Nesta amostra, a idade mediana foi de 66 anos, todas eram múltiparas e 95,1% encontravam-se na pós-menopausa; 47,5% referiam história pessoal de histerectomia, 17,5% de colporrafia anterior, 10,0% de colporrafia posterior e 7,5% de correção de prolapso apical. À observação, para além do prolapso apical, 24,4% apresentavam prolapso anterior, 4,9% prolapso posterior e 53,7% prolapso dos três compartimentos. As técnicas utilizadas para correção vaginal do prolapso apical foram a suspensão dos ligamentos útero-sagrados (22,0%), a fixação ao ligamento sacro-espinhoso (68,3%) e a fixação à fáscia do músculo iliococígeo (9,8%). No mesmo tempo cirúrgico, 39,0% foram histerectomizadas (com colporrafia anterior em 4/16; posterior em 3/16 e ambas em 7/16), 7,3% submetidas a colporrafia anterior, 2,4% a colporrafia posterior e 36,6% a colporrafia anterior e posterior. Não se registaram complicações no período peri-operatório. A taxa de sucesso terapêutico foi de 82,9%. Verificou-se recidiva clínica do prolapso apical em 17,1% e de outros prolapsos em 4,9%, um caso de incontinência urinária de urgência e dois de fístulas. Estas complicações ocorreram nos primeiros seis meses após a cirurgia em 34,1%. Não se registaram diferenças estatisticamente significativas relativamente à taxa de sucesso ou de complicações entre as três técnicas estudadas.

Conclusão: O uso de tecidos nativos para correção do prolapso apical revelou-se um método efetivo e seguro com baixa morbilidade. Neste estudo, todas as técnicas estudadas revelaram-se igualmente eficazes, sugerindo que a sua escolha deve depender da experiência do cirurgião.

Palavras-chave: Procedimentos Cirúrgicos em Ginecologia; Procedimentos Cirúrgicos Reconstructivos; Prolapso de Órgão Pélvico/cirurgia; Vagina/cirurgia

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Introduction

The pelvic organ prolapse (POP) prevalence is 40%-60% in multiparous women.¹⁻³ Its incidence is increasing due to the global aging of the population.⁴ Women with POP commonly have a variety of pelvic floor symptoms which can be site specific and independent of the stage of the prolapse. Despite being a benign condition, POP has a significant impact in women's wellbeing,⁵ and is one of the most common indications for gynecological surgery, with an estimated lifetime surgery-risk of 11% for women who reach 80 years of age.^{6,7} The etiology of POP is complex and multifactorial risk factors include age, parity, type of delivery, previous pelvic surgeries, congenital or acquired connective tissue disorders and conditions associated with chronic increase of intra-abdominal pressure.

Apical prolapse results from various defects in apical support, including: the loss of cardinal / uterosacral support with resultant cervical/uterine or vaginal cuff defect; the detachment of the fibromuscular vagina from the anterior rectum with resultant enterocele or sigmoidocele and tears or attenuation of the upper fibromuscular tissue, usually after hysterectomy, leading to a central apical descent that frequently presents as a ballooning defect.^{8,9}

The true incidence of vault prolapse after hysterectomy is uncertain, but its prevalence can vary from 0.2% to 43%.¹⁰ Prolapse occurs in equal numbers after abdominal or vaginal hysterectomies.¹¹

Isolated apical prolapse or isolated prolapse of the anterior or posterior vaginal walls are unusual, since defects in the connective tissue, neural pathways and muscle are rarely confined to one site.^{12,13}

The surgical correction of apical prolapse can be challenging but its relevance is nowadays well established. Actually, due to its significant contribution to the vaginal support, anterior and posterior vaginal repairs may fail unless the apex is adequately supported, and so apical prolapse repair should be included in the majority of pelvic reconstructive surgery procedures.^{3,14,15}

Transvaginal surgical procedures for correction of apical prolapse can be divided into three groups: those using native tissues, those using prosthesis and obliterative procedures that close the vaginal lumen. There is an increasing interest in transvaginal prosthetic-free procedures, due to its lower cost and the absence of mesh related complications, such as extrusion or expulsion, vaginal fibrosis, dyspareunia, infection and organ perforation.^{16,17}

The aim of this study was to evaluate the demographic characteristics, success and complications of different techniques of transvaginal correction of apical prolapse using native tissues.

Material and Methods

This is a retrospective study, with review of clinical files of 41 women with apical prolapse undergoing transvaginal correction

using native tissues, between January of 2013 and June of 2018, by the Urogynecology Department of a tertiary hospital. Obliterative procedures were excluded. Patient data were anonymised and none of the authors had access to patient identification. The authors have followed the protocols of their working center regarding the publication of patient data.

Demographic characteristics (such as age, parity, heaviest newborn weight and menopausal status), past surgical history, concomitant urinary complaints and presence of other significant prolapses in clinical examination were studied. Significant prolapses were defined as symptomatic and/ or grade superior to two in the Baden-Walker classification. It were also analyzed performed techniques, other surgical procedures concomitant with apical prolapse correction, immediate complications (during hospitalization) and late complications (after discharge), as well as the time elapsed from surgery to the appearance of complications. The primary end point was the success of surgical treatment, defined as no apical prolapse or apical prolapse with grade inferior to three in the Baden-Walker classification without bothersome vaginal bulge symptoms or need of retreatment. Additionally, success and complication rate among the different techniques of native tissues repair were compared.

The statistical analysis was performed using the software IBM SPSS statistics version 22.0. Fisher's exact test was used to compare success and complication's rate between the different techniques. The differences were considered statistically significant with p values less than 0.05.

Results

In this study, 41 women met the inclusion criteria. Mean patient age was 66 years (40-83). Thirty-nine (95.1%) women were in menopause and all were multiparous, with 17.5% having more than three deliveries in past history and 34.6% with at least one newborn weighing 4000 g or more. Regarding past surgical history, 47.5% had a previous hysterectomy (17.5% vaginal and 30.0% abdominal), 17.5% had an anterior prolapse repair, 10.0% a posterior prolapse repair and 7.5% apical prolapse repair. Tables 1 and 2 describe the variables presented above.

Stress incontinence was reported by 7.3%, urge incontinence by 14.6%, mixed incontinence by 12.2% and straining to void by 17.0%. On clinical examination, in addition to apical prolapse, 24.4% presented prolapse of the anterior compartment, 4.9% of the posterior compartment and 53.7% of both compartments.

Surgical apical prolapse correction was performed with transvaginal uterosacral ligament suspension in 22.0%, sacrospinous ligament fixation in 68.3% and with iliococcygeus fixation in 9.8%. Additionally, at the same surgical session, 39.0% of the women underwent vaginal hysterectomy (with anterior and posterior colporrhaphy in 7/16, anterior repair in 4/16 and posterior repair in 3/16 cases), 7.3% had anterior compartment repair, 2.4% pos-



Table 1: Demographic characteristics of the sample

Age (years)	66 ± 9.1 (40-83)
Parity (%)	
Nulliparous	0
Multiparous	82.5
Grand multiparas (>3 deliveries)	17.5
Weight of the heaviest newborn (grams)	3681.9 ± 781.1 (1200-5000)
< 2500 (%)	3.8
2500-2999 (%)	7.7
3000-3499 (%)	23.1
3500-3999 (%)	30.8
≥4000 (%)	34.6
Menopausal status (%)	
Premenopausal	4.9
Postmenopausal	95.1

terior compartment repair and in 36.6% both compartments were repaired. Table 3 describes the surgical procedures performed.

During the perioperative period there were no reported complications. Concerning late complications, 17.1% had clinical apical prolapse recurrence and 4.9% recurrence of other type of prolapse. It was reported a case of urge incontinence and two cases of fistulas. In 34.1%, these complications occurred in the first 6 months after surgery. Therapeutic success was observed in 82.9%. Recurrence of apical prolapse (n=7) occurred within the first 4 months after surgery.

There was no statistically significant difference concerning either the success or the occurrence of complications between the three different techniques of apical prolapse repair (Table 4).

Discussion

The success of apical prolapse treatment still is one of the major challenges of pelvic floor surgery.

Despite data suggesting that abdominal surgery provides better objective anatomic outcomes, vaginal procedures are minimally invasive with reduced rates of postoperative prolapse symptoms, reoperation, and adverse events.^{3,18,19} Concerning the material used for repair, current evidence shows that native tissue have has similar rates of recurrence (prolapse affecting quality of life and/or prolapse on examination), re-operation for prolapse, dyspareunia and stress urinary incontinence when compared to transvaginal mesh procedures for apical vaginal prolapse. However, transvaginal mesh procedures were associated with higher rates of vesical laceration, and significant rates of mesh related

Table 2: Past surgical history of the sample (%)

Vaginal hysterectomy	17.5
Abdominal hysterectomy	30.0
Anterior prolapse repair	17.5
Apical prolapse repair	7.5
Native tissues	2.5
Mesh	5.0
Posterior prolapse repair	10.0

Table 3: Surgical procedures performed (%)

Vaginal hysterectomy	39.0
With anterior and/ or posterior colporrhaphy	87.5
Anterior colporrhaphy	7.3
Posterior colporrhaphy	2.4
Anterior and posterior colporrhaphy	36.6
Apical prolapse repair	
Uterosacral ligament suspension	22.0
Sacrospinous ligament fixation	68.3
Iliococcygeus fixation	9.8

complications and re-operation due to mesh exposure. These facts have led to the worldwide removal of the mesh products widely in use and its replacement by newer products, not yet properly evaluated in randomized controlled trials.³ In our center, we prefer native tissue surgery since it does not have synthetic mesh complications and thus has lower overall reoperation rates.

In order to evaluate the success of the surgery for POP's correction, it is extremely important to take into account not only the anatomical results, but also patient's satisfaction, namely the absence of symptoms.

In a literature review of mostly observational studies about sacrospinous fixation (the main operation for vaginal vault prolapse using native tissues), cure rates of prolapse-related symptoms ranged from 70% to 98% (only four studies reported subjective results) and the range of objective cure rates was 67% to 97%.¹¹ In this study, our success rate, including clinical and subjective outcomes, was 82.9%, which is in accordance with the literature.

More than 40 different operations for the treatment of vaginal vault prolapse have been described.¹¹ Transvaginal uterosacral ligament suspension is a well-documented technique for apical prolapse repair with native tissues. McCall published this technique in 1957 and it is usually used in the context of a vaginal hysterectomy to promote apical support.⁸ There are several variants of this technique but all share ureter injury as complication, due to its proximity to the uterosacral ligament.^{8,20} However this is

**Table 4:** Comparison of success and late complications rate between three different techniques of apical prolapse repair

			P value
	US (n=9)	IC (n=4)	
Success	9/9	2/4	NS
Late complications	1/9	1/4	NS
	US (n=9)	SS (n=28)	
Success	9/9	20/28	NS
Late complications	1/9	9/28	NS
	SS (n=28)	IC (n=4)	
Success	20/28	2/4	NS
Late complications	9/28	1/4	NS

US: uterosacral ligament suspension; SS: sacrospinous ligament fixation; IC: iliococcygeus fixation; NS: non-significant

a rare complication; in a large series, ureteral injury after uterosacral ligament suspension was only 2.6%.²¹ Current data regarding McCall's culdoplasty are limited to retrospective series with reoperation rates for POP ranging from 0% to 14%.^{22,23} Sacrospinous ligament fixation for vaginal vault prolapse repair is the most commonly studied transvaginal procedure for treating vaginal vault prolapse. It was first described in 1951 by Amreich and Richter and suspends the vaginal vault uni- or bilaterally to the sacrospinous ligaments by one or two points of nonabsorbable material.⁸ It is performed more commonly on posthysterectomy vaginal prolapse repair. Severe complications have been described, including injury to the pudendal nerve, internal pudendal artery or vein, rectum and ureter.²⁴ Sacrospinous ligament fixation for vaginal vault prolapse repair is associated with good anatomical success, with a success rate of 84.6%, and a recurrence rate of 5.3% in a large systematic review.²⁵ Iliococcygeus fascia fixation is technically simple and is associated with low morbidity. Complications related to this procedure include transient urinary retention, urinary tract infections and vaginal granuloma.^{26,27} However, iliococcygeus fascia fixation is not commonly performed and there are few data regarding this procedure. Medium and long-term follow-up studies have shown that iliococcygeus fascia fixation is a durable procedure, with objective cure rates ranging from 84% to 96% up to 5 years after surgery.²⁷⁻²⁹

Although results show that iliococcygeus fascia fixation may be considered a valid alternative to transvaginal repair of vaginal vault prolapse, the principal choice is between sacrospinous ligament fixation or uterosacral ligament suspension for surgeons adopting native tissue in transvaginal apical prolapse repair. The OPTIMAL randomized trial, concluded that both uterosacral ligament and sacrospinous ligament fixation are safe procedures with less than 5% of serious adverse events over a 2-year follow-up period that were directly related to the index surgery. There were

no significant differences between uterosacral ligament suspension and sacrospinous ligament fixation in most perioperative outcomes, including blood loss and severe intraoperative or postoperative adverse events.³⁰

In this study all of the techniques were equally effective. None of the observed complications were statistically related to a specific correction technique, there were no cases of transient ureteral obstruction (specific of uterosacral ligament suspension) or buttock pain (typical of sacrospinous ligament fixation).

This study is subject to selection bias, as it included mostly elderly women, all multiparous, which are both recognized risk factors for POP. Additionally, 47.5% of the women had hysterectomy in past surgical history. The prolapse classification used was Baden-Walker system and the evaluation of patient's satisfaction was performed subjectively. Besides, this was a retrospective study, based merely on information contained in the clinical files. Due to insufficient data, it wasn't possible to calculate the body mass index or to identify the ethnicity of the patients, so we could not evaluate the impact of these variables on the surgical outcomes. Since the study included cases until June 2018, the duration of follow-up of most recent cases was limited for detection of accurate recurrence and complications rates.

Conclusion

In this retrospective study, the use of native tissues to correct apical prolapse is an effective and safe method with low morbidity. While new transvaginal apical mesh products are not rigorously evaluated, native tissue repair is a valid alternative with high success rate (of 82.9% in our study) and less adverse effects in the medium / long term.

There are various methods of transvaginal apical prolapse repair. Regarding current evidence, surgeon's experience must be considered when deciding which procedure to perform. Prospec-



tive studies comparing techniques of native tissue apical repair are needed, with objective and uniform criteria, validated satisfaction questionnaires and long-term follow-up of the patients. ●

Responsabilidades Éticas

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Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes.

Proteção de Pessoas e Animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pelos responsáveis da Comissão de Investigação Clínica e Ética e de acordo com a Declaração de Helsínquia da Associação Médica Mundial.

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