

The autologous rectus fascia sheath sacrocolpopexy and sacrohysteropexy, a mesh free alternative in patients with recurrent uterine and vault prolapse: A contemporary series and literature review

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Abstract

Introduction: About 40% of women suffer pelvic organ prolapse (POP) in a lifetime. The current standard intervention for vault prolapse is a mesh sacrocolpopexy or sacrohysteropexy. However, patients and surgeons are increasingly hesitant to use mesh given recent the UK and Food and Drug Administration warnings and litigation. A possible alternative is to use autologous tissue to support the vault, as a mesh-free solution. We report the outcomes from an initial series of autologous rectus fascia sheath (RFS) sacrocolpopexy and sacrohysteropexy in patients with complex pelvic floor dysfunction.

Patients and Methods: All patients had previous, multiple urological/gynecological surgery and declined standard mesh repairs. All had preoperative videourodynamics and defecating magnetic resonance imaging evaluation. The autologous POP repair was performed using 10–18 cm of rectus sheath with a similar technique to that employing mesh to support the anterior-posterior vaginal walls or encircle the cervix and secured to the sacral promontory.

Results: Seven patients with a mean age of 52 (33–64) years underwent autologous RFS POP repair between 2014 and 2017. Mean follow-up is 16 (range 2–33) months. All patients have durable result at last follow-up. No significant complications are reported.

Conclusions: This is the first report of patients with complex pelvic floor dysfunction and apical POP being managed with autologous RFS sacrocolpopexy/sacrohysteropexy, and only the second report of a free graft being utilized with success. Autologous RFS sacrocolpopexy/sacrohysteropexy avoids the 10%–15% risks of mesh-related complications. Further studies of long-term durability are needed.

Keywords: Prolapse, sacrohysteropexy, sacrocolpopexy, vaginal mesh

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Received: 18.06.2018, **Accepted:** 16.10.2018

INTRODUCTION

Epidemiological study suggests that up to 40% of all women develop a degree of pelvic organ prolapse (POP)

during their lifetime,^[1] and the life risk of requiring surgical repair is 11%.^[2] Surgical management of vault prolapse

Access this article online	
Quick Response Code:	Website: www.urologyannals.com
	DOI: 10.4103/UA.UA_85_18

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How to cite this article: Seth J, Toia B, Ecclestone H, Pakzad M, Hamid R, Greenwell T, *et al.* The autologous rectus fascia sheath sacrocolpopexy and sacrohysteropexy, a mesh free alternative in patients with recurrent uterine and vault prolapse: A contemporary series and literature review. *Urol Ann* 2019;11:193-7.

by abdominal sacrocolpopexy or sacrohysteropexy is considered the gold standard, based on high success rates for functional and anatomical outcomes.^[3]

In the last two decades, transabdominal POP repairs have been performed using polypropylene mesh to reduce risk of medium- and long-term recurrence.^[3] However, with the popularization of mesh usage, the numbers of complications with its use are increasingly reported. Complications include mesh erosion, quoted at up to 19.6%, and chronic pelvic pain in up to 12%, which may render the patient in a worse state of health in such cases.^[3-7]

Patients and clinicians are now requesting non-mesh alternatives. The use of autologous rectus fascia sheath (RFS) is increasingly being preferred in patients with stress urinary incontinence, as an alternative to the tension-free transvaginal tape (TVT) and TVT obturator tape.^[8] The success rates for autologous fascia seem to be broadly similar to those using polypropylene mesh in these cohorts.^[9,10] As such, it seems sensible to offer patients autologous sacrocolpopexy and sacrohysteropexy as a meshfree alternative for uterine and vault prolapse. We report the use of RFS as a free graft for recurrent abdominal prolapse in a series of patients with complex pelvic floor dysfunction.

PATIENTS AND METHODS

Patients with complex pelvic floor dysfunction who were referred to a tertiary center were all discussed at multidisciplinary meeting. All patients had (multiple) previous gynecological or urological surgeries and had significant symptomatic POP. Patients who were felt to be a risk of (*de novo* or further) mesh complication were offered autologous sacrocolpopexy or sacrohysteropexy using RFS to perform the repair. Patient details were kept in a prospective database. All cases were performed by two specialists with expertise in pelvic floor dysfunction.

All patients were assessed by (repeat) videourodynamics and magnetic resonance imaging (MRI) defecating proctography to assess the nature of their incontinence and degree of POP. Incontinence was described by the Blaivas classification system and POP was measured by the extent of the vault descent below the pubococcygeal line.

The procedures were performed through Pfannenstiel access to harvest a strip of RFS 10–18 cm by 2.5 cm in length. Sacrocolpopexy and sacrohysteropexy were performed in similar fashion to their mesh alternatives. For sacrocolpopexy, the RFS was reconstructed in Y

configuration and secured to anterior vault and posterior wall with polydioxanone (PDS) sutures. For sacrohysteropexy, the RFS was wrapped around the cervix through windows in the broad ligament. The apex of the slings was attached to the ligament over the sacral promontory with PDS. In sacrocolpopexy, the sling was left tension-free while sacrohysteropexy was tensioned to elevate the uterus out of the pelvis [Figure 1]. The exposed length of RFS was extraperitonealized where possible.

RESULTS

Seven patients with the mean age of 52 (33–64) years underwent autologous RFS POP repair (sacrocolpopexy $n = 4$ and sacrohysteropexy $n = 3$). Mean follow-up is 16 (range 2–33) months.

Previous surgical interventions, videourodynamic evaluation, defecating MRI proctography findings, and the details of interventions are shown in Table 1. Patients had between one and six previous pelvic surgeries. One patient had POP repair alone, four had concomitant colposuspension, one patient takedown of previous failed Boari flap, one patient excision of ureterocoele, and one patient had cystectomy with neobladder and Mitrofanoff formation. The mean inpatient stay was 5.1 days (range 3–10). One patient required extended antibiotic cover for a post-operative chest infection. There were no other complications reported.

DISCUSSION

This is the first report of autologous RFS suspensions for POP in patients with complex (recurrent) pelvic floor dysfunction. All patients had successful resolution of their

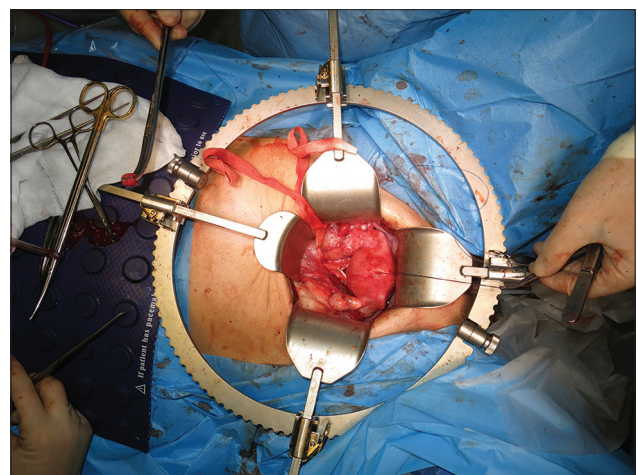


Figure 1: Autologous rectus fascia sheath sacrohysteropexy showing uterus suspended by rectus fascia sheath (tightened by suturing the two limbs together posterior to the cervix)

prolapse (and incontinence) symptoms at last follow-up.

To the best of our knowledge, autologous fascia POP repair has been reported in only five series [Table 2]. The largest series of 150 patients was performed using lateral

pedicled rectus fascia strips and concomitant reconstruction of the uterosacral ligaments. The authors' reported high patient satisfaction rates with no prolapse recurrence at 1 year. Some patients went on to have subsequent cesarean sections, and it was noted that there were some adhesions between

Table 1: Previous surgery, assessment, and interventions

Patient	Previous interventions	VCMG and MRI findings	Procedure	Outcomes
1	Colposuspension Posterior compartment repair Second posterior repair and anterior compartment repair TAH and BSO Mesh sacrocolpopexy	Type IIB SUI Detrusor overactivity 5.3 cm vault descent from pubococcygeal line	Autologous RFS sacrocolpopexy and redo colposuspension Abdominoplasty	No prolapse recurrence SUI cured
2	Colposuspension	No SUI Stable bladder 5.0 cm vault descent from pubococcygeal line	Autologous RFS sacrocolpopexy	No prolapse recurrence Sensory urgency persists
3	Laparoscopic sterilization TVT TVT excised to restore normal voiding Botox	Type IIB SUI Detrusor overactivity 3.0 cm vault descent from pubococcygeal line	Autologous RFS sacrocolpopexy and colposuspension Abdominoplasty	No prolapse recurrence 1 security pad/day Urgency resolved
4	TAH and BSO (with the right ureteric injury) Right Boari flap Redo right ureteric reimplantation Laparoscopic right nephrectomy Sacral nerve stimulator for voiding dysfunction	Type IIB SUI Hypocontractile 5.0 cm vault descent from pubococcygeal line	Autologous RFS sacrocolpopexy Take down of Boari flap, excision of remaining ureterocoele	No prolapse recurrence SUI cured CISC dependent
5	Bilateral duplex kidneys Left nephrectomy Left ureterocele, incised and subsequently resected Sacrospinous fixation Repeat vaginal prolapse surgery CISC dependent	Type IIA SUI Stable bladder 2.5 cm vault descent from pubococcygeal line Vaginal vault pulled laterally from previous surgery	Autologous RFS sacrohysteropexy and colposuspension Excision of recurrent urethrocele	No prolapse recurrence SUI cured
6	Lower segment cesarean section CVA Decreasing benefits of intravesical Botox End colostomy for bowel dysfunction (fecal incontinence)	Type IIA SUI Stable bladder 4.2 cm vault descent from pubococcygeal line	Autologous RFS sacrohysteropexy and colposuspension	No prolapse recurrence SUI cured CISC
7	Spina bifida TVT Complete erosion of urethra (urethral loss)	Type III SUI (no control) >5.0 cm descent from pubococcygeal line at rest	Excision of TVT Cystectomy, neobladder, and Mitrofanoff Autologous sacrohysteropexy Abdominoplasty	No prolapse recurrence Continent Mitrofanoff

RFS: Rectus fascia sheath, TVT: Transvaginal tape, MRI: Magnetic resonance imaging, SUI: Stress urinary incontinence, VCMG: Videocystometrogram, BSO: Bilateral salpingo-oophorectomy, TAH: Total abdominal hysterectomy, CVA: Cerebrovascular accident, CISC: Clean intermittent self-catheterisation

Table 2: Published series of autologous fascia sacrocolpopexy

Series	No patients	Patient type	Technique	FU (months)	Outcome
Jenkins and McCoubrie 1992 ^[11]	20	Primary 55% Recurrent 45%	Pedicled rectus sheath tendon flap	43	No recurrence of prolapse 3 patients (15%) developed small cystoceles
Quiroz <i>et al.</i> , 2008 ^[12]	15	Primary 91% Recurrent 9%	Free RFS graft abdominal sacral colpoperineopexy	13	Recurrence of prolapse in 1 case (7%)
Mahendru <i>et al.</i> , 2010 ^[13]	51	Primary 96% Recurrent 4%	Lateral pedicled rectus fascia strips	14-63	No recurrence
Yaqub and Shahzad 2013 ^[14]	150	Unspecified (mostly primary)	Lateral pedicled rectus fascia strips and concomitant reconstruction of the uterosacral ligaments	12	No recurrence
Oliver <i>et al.</i> , 2017 ^[15]	19	Mesh complications (erosion or pain)	L-shaped rectus sheath graft	9.9	No recurrence apical prolapse. 2 patients (11%) required surgery for anterior vaginal wall prolapse

RFS: Rectus fascia sheath, FU: Follow up

the uterus and the abdominal wall. There were no reported problems with the graft itself and no reports of erosion.^[14]

Jenkins and McCoubrie also reported the use of a pedicled RFS tendon flap as a mode of treating vault prolapse in 20 patients.^[11] A central strip of rectus was mobilized, 3 cm in width, and flapped from the distal attachment to the pubic symphysis. The proximal end of the graft was then sutured to the vaginal vault, thus suspending it from the pubis. After a mean follow-up of 43 months, no patients reported a prolapse recurrence, although three patients developed a small distal anterior wall (cystocele) prolapse.

Mahendru, in 2010, reported on 51 patients with posthysterectomy vault prolapse using bilateral pedicled flaps of rectus fascia, the medial aspects of which were sutured to the vaginal vault. The repair was durable at 14 months.^[13]

Quiroz *et al.* retrospectively compared outcomes between mesh ($n = 105$), Pelvicol xenograft ($n = 93$), and autologous fascia ($n = 15$) for abdominal sacrocolpopexy. POP repair was performed by an abdominal sacral colpoperineopexy in which the free RFS graft was secured to either the perineal body or the rectovaginal fascia. At 1.1 years recurrence occurred in 11% of the Pelvicol group, but only one patient in the synthetic group, and one patient autologous RFS group. All seven reoperations for apical prolapse were in the Pelvicol group. The authors concluded that recurrence is most likely with a Pelvicol graft but equivalent for mesh and autologous tissue.^[12]

Abraham *et al.* presented a single video case of a free RFS graft sacrocolpopexy, in a 76-year-old patient with previous sigmoid colectomy and ureteric injury, with no recurrence at 4 months.^[16]

Oliver *et al.* reported 19 patients with excision of sacrocolpopexy mesh for either refractory pelvic pain or mesh erosion. An L-shaped free graft RFS sacrocolpopexy was used to replace the mesh (compared with a Y-shaped configuration in our series). Concomitant midurethral sling was performed 47%, hysterectomy 58%, and rectopexy in 21%. At a median follow-up of 9.9 months, no recurrence of apical prolapse had occurred although two patients required surgery for anterior vaginal wall prolapse.^[15]

The use of mesh for POP can be associated with significant morbidity,^[4] most importantly visceral erosion and chronic pain. In 2008, the US Food and Drug Administration (FDA) issued a public health warning regarding complications of mesh implantation. In 2014, the

FDA classified transvaginal usage of mesh as a high-risk device^[17] and their use in vaginal prolapse repair has been severely curtailed.

Mesh is still commonly used for sacrocolpopexy and sacrohysteropexy as it has been shown that compared to suture alone techniques, there is a 2-fold reduction in the risk of anatomical recurrence.^[3] The rate of complications with mesh colposacropepy is lower than that reported for transvaginal mesh but is now becoming a recognized issue in its own right. In the colpopexy and urinary reduction efforts study, the estimated rate of vaginal erosion rate was 10% at 7 years, and the rate of pain without exposure even higher.^[18] One-third of patients presenting with mesh complications were related to sacrocolpopexy, mesh rather than vaginal mesh.^[19]

As far as we are aware, the only reports of autologous fascia use as a POP graft are those reported in the series above. In only two of these series (Oliver *et al.*^[15] and our own series) were a free RFS graft employed, and only in our series was the technique of Y-shaped sacrocolpopexy and sacrohysteropexy described. In all these series, the outcomes seem equivalent to those of mesh repairs and significantly better than (Pelvicol) xenograft, although the follow-up is relatively short. A further study using Pelvicol for sacrocolpopexy also showed a recurrence rate of 8.3% at 21 months.^[20]

The success of autologous RFS sacrocolpopexy and sacrohysteropexy is reflective of the experience of RFS durability with stress incontinence^[9,10] and seems durable at least over the short-to-medium term (9.9–63 months). However, prospective patients should be counseled about the lack of long-term and randomized, controlled trial data. It is vital until such data become available that autologous sacrocolpopexy/sacrohysteropexy should be performed within the realms of accurate audit and the outcomes monitored. Long-term data are still necessary to support the employment of autologous RFS sacrocolpopexy and sacrohysteropexy techniques in the wider, primary POP population.

CONCLUSIONS

This is the first report of patients with complex pelvic floor dysfunction and apical POP being managed with autologous RFS sacrocolpopexy and sacrohysteropexy, and only the second report of a free RFS graft being utilized with success. These two series demonstrate proof of concept for abdominal repair for POP, with safe and promising early functional results.

The technique offers a mesh-free approach, which could be considered for patients who are at potentially higher

risk of synthetic mesh extrusion. Further study is required to identify patient suitability, durability of treatment, and benefit over the more practiced standard treatment of polypropylene mesh repair.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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