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ORIGINAL ARTICLE

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Dermal graft-augmented rectocele repair

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Abstract We describe a new technique in the surgical treatment of rectocele using a dermal allograft to augment site-specific fascial defect repair of the rectovaginal fascia. The posterior vaginal wall is opened and discrete defects in the rectovaginal fascia are repaired in a site-specific fashion using delayed absorbable suture. A second layer of support is created using a rectangular dermal allograft placed over the site-specific repair and secured to the normal anatomic attachments of the rectovaginal fascia using permanent sutures. The vagina is then closed and routine perineorrhaphy performed as indicated. Forty-three women with advanced posterior vaginal wall prolapse underwent dermal graft augmentation of site-specific rectocele repair over a 1-year period. No major intraoperative or postoperative complications were reported. Thirty women were available for follow-up examination at an average of 12.9 months (range 8–17). The average patient age in the follow-up group was 63.6 ± 10.9 years (range 33–79) and average parity was 2.8 ± 1.5 (range 0–7). Using the Pelvic Organ Prolapse Quantification score, the average measurement of point A_p was 0.25 preoperatively and −2.4 postoperatively, whereas point B_p was 0.9 preoperatively and −2.5 postoperatively. Using a point A_p measurement of −0.5 or greater to define surgical failure, 28/30 (93%) of women were noted to have surgical cure on follow-up. Site-specific rectocele repair augmented with dermal allograft is associated with high cure rates and minimal complications. It recreates normal anatomic support and is easily adapted into current surgical procedures for rectocele repair.

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Introduction

The last decade has seen significant advances in the treatment of rectocele. Traditionally, rectocele has been treated with posterior colporrhaphy, which consists of a midline plication of the rectovaginal fascia through a transvaginal approach. This approach has limited application for several reasons. First, it assumes that the anatomic defect is due to a general stretching or weakening of the rectovaginal fascia, and that midline plication will strengthen this layer. Second, it depends on adequate strength of the rectovaginal septum for long-term support. Reported success rates with the traditional midline repair range from 65%–75% on medium-term follow-up (1–2 years), with significant decline beyond 3 years [1].

In an effort to improve anatomic and functional cure rates, site-specific defect repair of the rectovaginal septum for the treatment of rectocele has recently been introduced [2]. Compared to traditional posterior colporrhaphy, which assumes generalized laxity of the rectovaginal fascia, the site-specific repair postulates discrete breaks as the etiology of the rectocele. Recent data regarding this technique report success rates ranging from 72% to 85% on 1-year follow-up [3, 4]. Unfortunately, for several reasons this technique also has limited application. First, it assumes that all site-specific defects will be readily identifiable and correctable by the gynecologic surgeon. Second, the technique assumes that the rectovaginal septum is otherwise unweakened and has adequate strength after correction of the site-specific defect.

In order to address the limitations of these two previously described techniques, we present our technique of graft-augmented rectocele repair. This technique is easily adopted following either traditional midline colporrhaphy or site-specific defect repair. Since our first

case in 1997, we have gained increased experience with the technique, the use of various graft materials, and other applications of graft in pelvic reconstruction. This paper reviews our technique for dermal graft-augmented rectocele repair as well as our experience with safety and preliminary short-term anatomic results.

Technique

The preoperative use of estrogen cream for 3–4 weeks beforehand is recommended in postmenopausal women to improve intraoperative tissue handling and postoperative healing. Use of the dermal graft was based on intraoperative assessment of the strength of the repaired fascial layer or based on increased risk factors for failure/recurrence, including previous rectocele repair, obesity, chronic constipation or advanced prolapse. With the patient in the dorsal lithotomy position, vaginal surgery and pelvic repairs are performed as indicated. The rectocele repair is begun by placing Allis clamps bilaterally on the posterior perineum. A diamond-shaped incision is made incorporating the skin overlying the perineal body and posterior vaginal mucosa, and this superficial portion is excised. A subepithelial tunnel is developed in the rectovaginal space, beginning at the perineal body and extending toward the vaginal apex, using Mayo scissors. A midline incision is made in the posterior vaginal mucosa to the apex of the rectocele. The edges of this incision are grasped and the vaginal epithelium is dissected off the underlying rectovaginal fascia using sharp dissection. This dissection is extended bilaterally to expose the lateral attachments of the rectovaginal fascia to the levator ani muscles, and superiorly to expose the intact rectovaginal/pubocervical fascia.

The index finger of the surgeon's non-dominant hand is inserted into the rectum and used to elevate the anterior rectal wall. This allows inspection of the entire posterior segment and visualization of discrete site-specific defects in the rectovaginal septum (Fig. 1). The defects, which can be midline, lateral or transverse, are repaired by approximating the broken edges of the connective tissue using a series of interrupted delayed absorbable sutures. Distal reattachment of the rectovaginal septum to the perineal body is performed in a similar fashion as indicated. After completion of discrete fascial defect repair, the site is irrigated and hemostasis confirmed prior to placement of the dermal allograft (Fig. 2).

The dermal allograft (Duraderm, CR Bard, Covington, GA, or Repliform, Boston Scientific Corp., Natick, MA) is reconstituted by soaking it in a normal saline solution at room temperature for approximately 20 minutes prior to use. It is available in various sizes and thickness and can be trimmed to the appropriate size during surgery. For posterior vaginal wall repair, a 4 × 7 cm piece is available and usually requires no trimming. Although the dermal graft has stretch characteristics, the graft edge should extend to the levator muscles bilaterally without tension. The graft is attached using a series of interrupted permanent sutures (2/0 Ethibond; Ethicon, Somerville, NJ) along the proximal, lateral and distal edges. Two to three sutures are taken through the intact rectovaginal/pubocervical fascia at the apex of the dissection and secured to the proximal edge of the rectangular dermal graft. In patients in whom fascia can not be identified superiorly, the graft is attached to the underside of the vaginal mucosa as close as possible to the vaginal apex using delayed absorbable suture through the full thickness of the vaginal wall. These sutures are tied down to begin anatomic attachment of

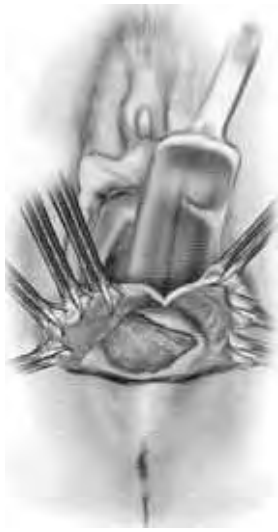

Fig. 1 Identification of a transverse defect in the rectovaginal fascia after initial mucosal dissection

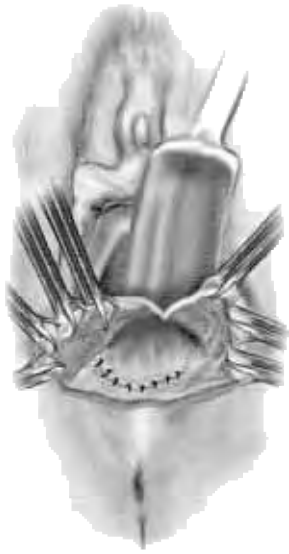

Fig. 2 Site-specific defect repair of the transverse fascial defect with interrupted sutures

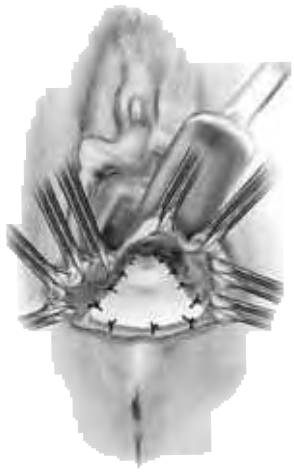

Fig. 3 Graft augmentation with reattachment of the graft proximally to the rectovaginal/pubocervical fascia, laterally to the levator ani muscles, and distally to the perineal body

the dermal graft and facilitate initial positioning. Next, a series of three to five sutures is placed bilaterally through the levator ani muscles, just above the attachment point of the normal rectovaginal fascia from the apex of the rectocele toward the perineal body. The sutures are attached to the lateral edges of the graft, taking care to correspond the spacing along the muscular attachments to the placement of sutures along the length of the graft. Tie-down of these sutures results in attachment of the dermal graft bilaterally without bunching or bulges. At this point, any excess graft material distal to the perineal body is trimmed to size prior to distal attachment. Finally, the distal edge of the graft is secured to the reconstructed or intact perineal body using two to three sutures, reapproximating the normal distal anatomic attachments of the rectovaginal septum. In cases with concurrent relaxation of the perineal body and gaping of the vaginal introitus, reconstruction of the perineal body should be performed prior to distal attachment of the graft (Fig. 3).

The site is irrigated and hemostasis reconfirmed. Digital rectal examination is performed prior to closure of the vaginal epithelium to exclude unintentional rectal injury and confirm appropriate surgical correction. Excess vaginal mucosa is excised and the vaginal epithelium and perineal skin are closed in the usual fashion. Vaginal packing may be placed at the surgeon's discretion.

Experience

Forty-three women underwent dermal graft augmentation of site-specific rectocele repair between June 1998 and July 1999, and 30 of them were available for follow-up examination at an average of 12.9 months (range 8–17). Average patient age in the follow-up group was 63.6 ± 10.9 years (range 33–79) and average parity was 2.8 ± 1.5 (range 0–7). Twenty-seven women underwent concurrent procedures. Of the 30 women seen for follow-up, 11 had had previous posterior repair and 19 underwent primary rectocele repair. Sixteen patients were postmenopausal or had had their ovaries removed, and only 9 of these patients were on regular hormonal supplementation. All patients were noted to have site-specific defects in the rectovaginal septum as the etiology of their rectocele –21 with bilateral and proximal transverse defects, 4 with a central midline defect, 3 with a distal transverse defect, 1 with a unilateral and proximal transverse defect, and 1 with a bilateral and distal transverse defect. The technique was performed in an identical fashion, with repair of the site-specific defect and then reattachment of the graft to its normal anatomy in all patients. A review of the office record, medical chart and operative notes was conducted to assess for major intraoperative or postoperative complications. No major intraoperative complications (hollow viscus injury, blood loss greater than 500 ml, or transfusion) or postoperative complications (infection, abscess or hematoma) were noted. No patient reported postoperative dyspareunia, and no graft-related complications, such as rejection, erosion, infection or fistula formation, were noted during the follow-up period.

Using the Pelvic Organ Prolapse Quantification score to assess the severity of prolapse pre- and postoperatively, the average measurement of point A_p was 0.25 preoperatively and –2.4 postoperatively, whereas point B_p was 0.9 preoperatively and –2.5 postoperatively. Using a point A_p measurement of –0.5 or greater to define surgical failure, 28/30 (93%) of women were noted to have surgical cure at follow-up.

Comment

Surgical treatment of rectocele with long-term recreation of the normal anatomy and restoration of normal function continues to challenge the gynecologic surgeon. Although the last decade has seen a marked improvement in our understanding of the anatomy and pathophysiology of rectocele, currently proposed surgical techniques still have limitations specific to the particular technique and the patient's own tissues. Our limited experience with the use of graft-augmented rectocele repair has shown it to be a safe and effective technique that hopefully will improve long-term anatomic results. After completion of a traditional midline repair or site-specific defect, graft augmentation according to the natural anatomic attachments of the rectovaginal septum is easily performed with readily available materials. Reinforcement of the repair as described addresses previously mentioned concerns about the patient's tissue strength and the need to identify all discrete defects.

Our earliest procedures were performed with cadaveric fascia, but its use was discontinued for several reasons. First, the material has a longitudinal fiber

orientation, which made the graft prone to splitting along the points of suture placement. Second, cadaveric fascia has few stretch properties, important in any graft used in the vagina, which ultimately stretches with intercourse and childbirth. Third, the in vivo tissue response of implanted cadaveric fascia is unpredictable. Since our early experience, Brubaker et al. have published several reports demonstrating cadaveric fascia failure following sling procedures and have cautioned against its use in urogynecologic procedures [5].

Dermal graft is currently our preferred material of choice because of its easy availability, increased thickness, and inherent tissue properties. It is histologically more similar to the "rectovaginal fascia" as previously described by Weber [6], and undergoes in vivo tissue remodeling to resemble host tissue after implantation [7]. Cadaveric human dermal graft has long been used in plastic surgery for treatment of burns [8], and in maxillofacial/oral surgery for gingival disease [9]. We have previously described the use of dermal graft in the repair of complicated rectovaginal fistula [10].

Over the last several years we have expanded our use of dermal graft for other types of prolapse. We have had no significant intraoperative or postoperative complications. However, long-term studies regarding the use of dermal graft for rectocele repair and other pelvic floor reconstruction are required and currently in progress.

Additional materials, including porcine dermis and porcine small intestinal submucosa, long used in other surgical areas with good results, have recently been introduced for urogynecologic procedures, and it is expected that other donor and synthetic tissues may become available in the near future. With improved experience and research, the optimal choice of tissue may be determined. Until then, long-term comparative data regarding the different tissues is lacking and gynecologic surgeons should be cautious regarding the use of new materials for repair augmentation.

Long-term cure rates for posterior vaginal wall prolapse continue to be suboptimal. This may be due to poor tissue strength, inadequate surgical repair, or continued stress due to chronic straining, obesity, and sustained increases in intra-abdominal pressure. Regardless of the etiology, graft-augmented rectocele repair may have the potential to improve long-term success rates. The procedure is easy to learn and incorporates basic principles of vaginal surgery already mastered by the average gynecologic surgeon. It is associated with few complications. The value of dermal graft augmentation in all patients versus selected cases with a higher chance of recurrence/failure, especially with regard to increased cost and related risk/benefit, is still unclear. Analysis of long-term success rates with this technique and comparisons with previously accepted surgical procedures are required and currently in progress.

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Editorial comment

This case series reports the use of human dermis to augment rectocele repair. This report clearly describes the technique, although dermal augmentation cannot be recommended in the absence of a randomized trial that demonstrates the superiority of this technique compared to the standard technique. Scientifically sound studies with appropriate follow-up are necessary to document the "safety and efficacy" of new materials. The safety and efficacy of this technique remains unproven.