Updates in Surgery
https://doi.org/10.1007/s13304-021-01179-0

TECHNICAL NOTE

Trans-vaginal repair of recurrent rectovaginal fistula with interposition of BIO-A Tissue Reinforcement

Alessia Fassari[1] · Emanuele Santoro[1] · Pasquale Paolantonio[2] · Marco Maria Lirici[1,3]

Received: 11 July 2021 / Accepted: 19 September 2021

Abstract

Rectovaginal fistulas (RVFs) represent the majority of all symptomatic leakages after anterior and low anterior resection in women. Conservative management is useful in paucisymptomatic patients with small fistulas but is usually unsuccessful in all other cases. The surgical strategies are various and heavily dependent on the type and extent of anatomic involvement. We present a case of a 51-year-old female with a multi-recurrent rectovaginal fistula that occurred since a laparoscopic sigmoidectomy was performed for a complicated diverticular disease in May 2015. An attempt to close the fistula was undertaken three times. In July 2019, a transvaginal repair was performed with interposition in the rectovaginal septum of GORE® BIO-A® Tissue Reinforcement. The postoperative course was uneventful. There was no recurrence and functional outcome was good at 24-months follow-up. Rectovaginal fistula can be successfully treated using the interposition of a GORE® BIO-A® Tissue Reinforcement with significant economic savings and good functional outcomes even through a transvaginal approach. It represents a therapeutic option for an otherwise difficult-to-treat complex fistula.

Keywords Rectovaginal fistula · Transvaginal repair · Biosynthetic reinforcement

Introduction

Rectovaginal fistula (RVF) is an abnormal passage between the anterior wall of the rectum and the posterior wall of the vagina. The common causes of acquired colorectal-vaginal fistula are obstetric injury, pelvic irradiation, pelvic malignancies, diverticular disease, inflammatory bowel disease and iatrogenic conditions [1]. Among the latter there are colorectal resection, ileal pouch–anal anastomosis, procedures involving the posterior vaginal wall, perineum, anus or rectum. RVFs cause significant and distressing symptoms including passage of faeces or flatus from the vagina, recurrent urinary tract infections, vaginitis, vaginal bleeding and vaginal discharge. Currently, the preferable modalities of choice for pelvic fistula evaluation are magnetic resonance (MRI) and multidetector computed tomography (CT) for patients unable to get an MRI [2].

Various surgical strategies have been described to repair RVFs and their associated anatomical defects.

We illustrate the technique of transvaginal repair with GORE® BIO-A® Tissue Reinforcement (W. L. Gore & Associates, Inc. Newark, DE, USA) interposition in a case of multi-recurrent RVF in a 51-year-old woman who first underwent laparoscopic sigmoidectomy for stenosing diverticulitis and then, from June 2015 to November 2018, was unsuccessfully treated by two further colorectal resections and one transvaginal repair with diverting ileostomy. At first a Hartmann's procedure was performed but a few days after laparoscopic Hartmann's reversal the RVF recurred. A resection of the colorectal anastomotic complex was then performed with a new double-stapled colorectal anastomosis protected by a diverting ileostomy. The RVF recurred 18 months after ileostomy closure. Finally, a transvaginal repair was attempted, and a diverting ileostomy fashioned again (July 2017) but 9 months after ileostomy closure (October 2018), the patient was referred to our department for perineal pain and smelly discharge from vagina.

✉ Marco Maria Lirici
marcomaria.lirici@unicamillus.org

[1] Department of Surgery, San Giovanni Addolorata Hospital Complex, Rome, Italy

[2] Department of Radiology, San Giovanni Addolorata Hospital Complex, Rome, Italy

[3] Saint Camillus International University of Health and Medical Sciences (UniCamillus), Rome, Italy

Surgical technique and technologies

At first, a diverting loop colostomy was fashioned to prevent tissue contamination and patient was advised to do periodic enemas and vaginal douching. In July 2019 the transvaginal repair of the rectovaginal fistula was performed using GORE® BIO-A® Tissue Reinforcement.

GORE® BIO-A® Tissue Reinforcement is a biosynthetic web scaffold designed for soft tissue reinforcement. It features a 3D matrix of open, highly interconnected pores that facilitates cell infiltration and tissue generation, leaving no permanent material behind (Fig. 1).

Through a transvaginal approach, with the vaginal lumen kept open wide with vaginal retractors, the fistulous tract was visualized on the posterior wall right below the posterior fornix at about 7 cm from the vulvar ostium. The orifice of the fistula was opened wide, achieving suitable exposure of the rectovaginal septum with transfixed suture traction on the rim of the vaginal wound.

The rectovaginal septum was markedly thin and weak. It was first extensively dissected, then curetted and irrigated with a povidone-iodine solution and saline solution. Three residual staples in the rectovaginal septum were removed. This allowed us to have a clear view of the colorectal anastomosis and assess its integrity.

An 8 × 8 cm GORE® BIO-A® Tissue Reinforcement was trimmed tailoring its dimension down to 8 × 6 cm intraoperatively. The patch was interposed between the anterior colorectal wall including the colorectal anastomosis and the posterior vaginal wall with at least 3 cm overlap above and below the anastomosis. It was then fixed with fibrin glue (Tisseel—Baxter Healthcare Corp. Deerfield, IL, USA) to minimise displacements, thus reinforcing the RV septum. The posterior wall of vagina was finally closed with several 2-0 Polyglycolic Acid interrupted suture (Fig. 2a–c). Drainage was not required.

Postoperative course

The stoma was reversed 3 months later. Postoperative course was uneventful. There was no recurrence and functional outcomes were good at 24-month follow-up. The patient reported substantial wellbeing with good anal function. The pelvic floor muscle function and strength was evaluated clinically but no instrumental examination was performed. Presence of postoperative subclinical leaks has been evaluated by pelvic MRI at 6-month follow-up. This is the time the tissue reinforcement is almost completely absorbed and presumably with the highest risk of fistula recurrence. Control MRI showed scar tissue thickening of the rectovaginal septum and no fluid collection (Fig. 3b).

Discussion and conclusion

At present, the main therapeutic methods include conservative therapy, surgical treatment and interposition of biomaterials. Although conservative management has been utilized in some cases, majority of patients are treated surgically [3]. Diversion stoma helps symptoms control most times. Surgical treatment includes abdominal repair with resection of colorectal anastomosis, closure of the vaginal fistula and creation of a new anastomosis. To reduce local recurrence it is important to interpose healthy tissue like omentum between the vaginal repair and the new anastomosis. Transposition of the gracilis muscle seems to be an effective procedure especially for recurrent rectovaginal fistula when conventional surgery fails [4].

Direct closure is not considered to be effective for rectovaginal fistula repair and fistula size may be a contraindication. Furthermore, a direct closure was already attempted unsuccessfully.

The bioabsorbable GORE BIO-A® Tissue Reinforcement provides a scaffold for ingrowth of native tissue. Consequently, the eventual absorption of exogenous material after healing aims to avoid the long-term complications of

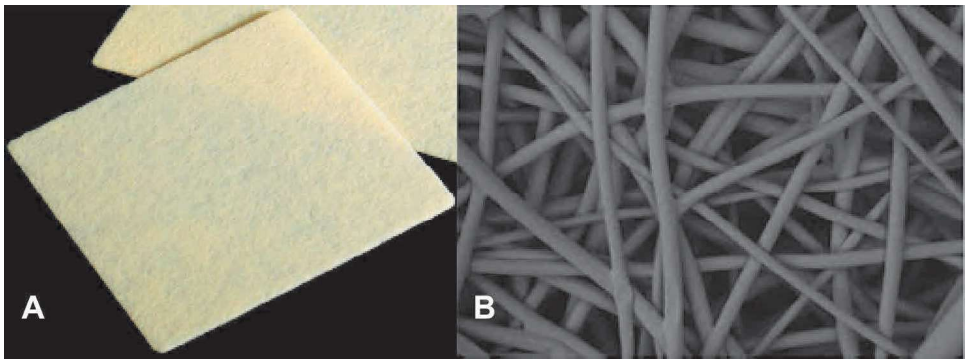

Fig. 1 **A** GORE® BIO-A® Tissue Reinforcement, especially designed for rectovaginal repair. **B** Electronic microscopic appearance of the polymers, polyglycolic acid and trimethylene carbonate mesh scaffold (Mag × 100)

Journal : Large 13304 | Article No : 1179 | Pages : 4 | MS Code : 1179 | Dispatch : 24-9-2021

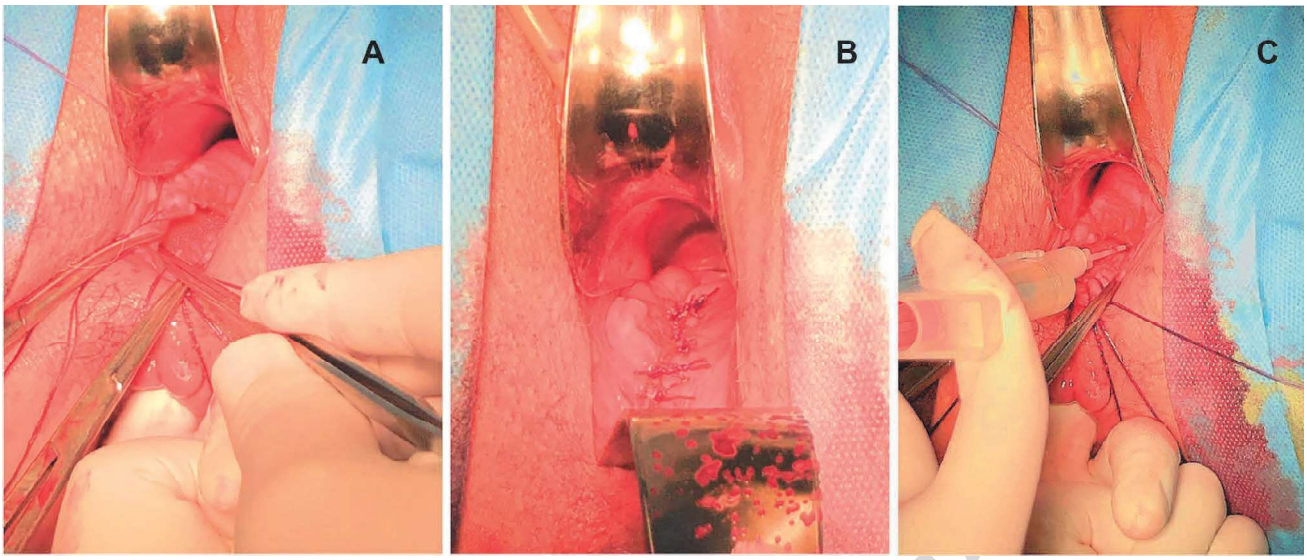

Fig. 2 Operative steps of BIO-A® Tissue Reinforcement placement for treatment of high RVF. A 8×8 cm e GORE® BIO-A® Tissue Reinforcement cut and tailored intraoperatively was interposed between the anterior colorectal wall including the colorectal anastomosis and the posterior vaginal wall (**A**) and fixed with fibrin glue (Tisseal) in order to minimise displacements (**B**). The posterior wall of vagina was finally closed with 2-0 Polyglycolic Acid suture (**C**)

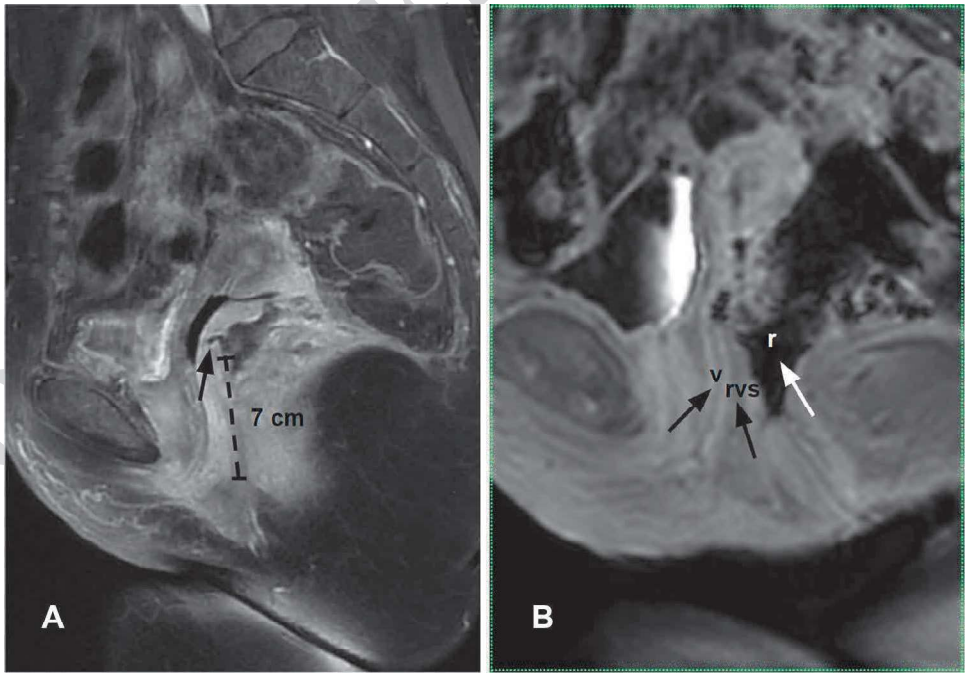

Fig. 3 Preoperative and postoperative (18-month follow-up) imaging. **A** Preoperative MRI: Sagittal T2-weighted image showing the high rectovaginal fluid-filled fistula (arrow): the fistulous tract was visualized on the posterior wall right below the posterior fornix at about 7 cm from the vulvar ostium. **B** Postoperative MRI: coronal T1-weighted image showing scar tissue thickening of the rectovaginal septum (rvf) and no abnormal passage between rectum (r) and vagina (v) (arrows)

an indwelling foreign body. Its resorption starts at the 6th week and is completed after 6–7 months. Diverting stoma and the use of the bioabsorbable GORE® BIO-A® consent to control postoperative infection. BIO-A® Tissue has good handling and could be tailored intraoperatively for optimal adaptation. Efthimiou and Negro showed satisfactory outcomes in inguinal hernia repair. Burgess has also reported its use in a case of Amyand hernia. Sutton et al. demonstrated its effectiveness for the closure of an open abdomen. Ommer et al. described the benefits of Gore Bio-A Fistula Plug® in the treatment of high anal fistulas [5]. Recently it has been used for paraesophageal hiatal hernia repair and repair of other diaphragmatic defects [6].

To our knowledge, this is the first report in which BIO-A®, an absorbable Tissue Reinforcement, is used for the treatment of RVF with a trans-vaginal placement.

Journal : Large 13304 | Article No : 1179 | Pages : 4 | MS Code : 1179 | Dispatch : 24-9-2021

AQ5 Very few cases of rectovaginal fistula repairs with Permacol™ (Medtronic—Minneapolis, MN, USA) are reported in literature [7, 8]. Permacol is a cross-linked biological mesh with high tensile strength, not absorbable and only partially incorporated, and with high up-front costs. Furthermore, interposition of Permacol meshes is reported only after redo colorectal resection through the abdominal route and has never been implanted through the vagina. The transvaginal approach makes our procedure different from the others. The costs are significantly higher for biologic mesh with a range in price up to ~ $30/cm^2 compared to $10/cm^2 for BIO-A®. It has been developed to provide clinical results at considerable economic value over biologic meshes, making it a preferable choice for soft tissue reconstruction.

We preferred to have an as much clean as possible operating field before tissue reinforcement implant. This explains the 8-month time lapse with close hygienic prescriptions after colostomy construction. During the 24-month follow-up the patient never reported functional impairment thus, we did not consider necessary any further functional investigation.

RVF can be successfully treated using the interposition of a GORE® BIO-A® Tissue Reinforcement in selected cases, with significant economic savings and good outcomes.

Declarations

Conflict of interest None.

References

1. VanBuren WM, Lightner AL, Kim ST et al (2018) Imaging and surgical management of anorectal vaginal fistulas. Radiographics 38:1385–1401
2. Grace Knuttinen M, Yi J, Magtibay P et al (2018) Colorectal-vaginal fistulas: imaging and novel interventional treatment modalities. J Clin Medv 7(4):87
3. Helene C, Leon M, Xavier T et al (2015) Rectovaginal fistula: what is the optimal strategy? Ann Surg 262(5):855–861
4. Fürst A (2017) Gracilis transposition for repair of recurrent rectovaginal fistula. Coloproctology 39:84. https://doi.org/10.1007/s00053-017-0151-6
5. Ommer A et al (2012) Gore BioA fistula plug in the treatment of high anal fistulas—initial results from a German multicenter-study. German Med Sci. https://doi.org/10.3205/000164
6. Lirici MM, Bongarzoni V, Paolantonio P, Leggeri T, Pirillo SP, Romeo V (2020) Minimally invasive management of rare giant Bochdalek hernia in adults. Minim Invasive Ther Allied Technol. https://doi.org/10.1080/13645706.2019.1641523
7. Shabbir J, Bailoor D, Widdison AL (2007) Treatment of anastomotic-vaginal fistula complicating colorectal resection using Permacol interposition in lieu of omentum. Int J Colorectal Dis 22(7):845–846
8. Serventi A, Binda GA (2016) Repair of an anastomotic-vaginal fistula with biological mesh (Permacol™) after surgery for low rectal cancer. Tech Coloproctol 20(3):199–200

Journal : Large 13304 | Article No : 1179 | Pages : 4 | MS Code : 1179 | Dispatch : 24-9-2021