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IUJ VIDEO

Repair of colonic neovaginal stenosis using a biological graft in a male-to-female transgender patient

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Abstract

Introduction and hypothesis One in 2900 genotypical men report gender dysphoria, and many undergo gender confirmation surgery to match their physical phenotype to their identity. A variety of surgical techniques are used in male-to-female transgender patients, one of which is bowel vaginoplasty, and postoperative stenosis of the colonic neovagina is common. Extracellular matrix grafts have been used in vaginal reconstruction. with porcine urinary bladder matrix (UBM) acting as a scaffold for smooth-muscle tissue and matrix regeneration. The aim of this surgical video is to describe the use of a UBM biological graft in repair of introital stenosis due to recurrent granulation tissue in the colonic neovagina of a male-to-female transgender patient.

Methods A 32-year-old male-to-female transgender patient with a history of rectosigmoid neovagina formation for genital gender confirmation surgery 12 months prior presented with genital granulation tissue and stenosis of her neovaginal introitus. Despite two surgical revisions, the patient developed recurrence of granulation tissue and obliteration of the neovaginal introitus, preventing sexual function of the neovagina.

Results Reconstruction of the neovaginal introitus was performed using UBM. The patient noted improvement in comfort, hygiene, and quality of life following the procedure. This video describes our surgical technique and perioperative clinical findings.

Conclusions We report the novel use of UBM biological graft in the revision of a neovaginal introitus after former rectosigmoid vaginoplasty in a male-to-female transgender patient.

Keywords Neovagina · Stenosis · Biological graft · Transgender · Extracellular matrix · Matristem

Introduction

Transgender individuals experience discordance between their assigned birth sex and their personal sense of gender. Discomfort with this discordance can give rise to gender dysphoria [1]. Conservative estimates report that 0.5% of the global population, approximately 25 million individuals, identify as transgender [1], and one in 2900 genotypical men report gender dysphoria [2]. Gender-affirmation surgeries are an important aspect of transition-related health care. A national survey revealed that 25% of transgender respondents within the United States had undergone gender affirmation surgery, with 42% of female-to-male (transmen) patients and 28% of male-to-female (transwomen) patients reporting at least one surgical procedure [3].

For transwomen, surgical interventions may include hair removal, laryngeal surgery for vocal change, facial feminization surgery, tracheal shave, silicone injections, augmentation mammoplasty, orchiectomy, or vaginoplasty [3]. Vaginoplasty is used to describe some combination of orchidectomy, penectomy, clitoroplasty, labiaplasty, and creation of a neovagina [4]. Previous studies estimated 10% of transwomen have undergone vaginoplasty and an additional 45% express the desire to do so in the future [3].

No universally accepted standard exists for surgical technique in the creation of the neovagina. The procedure has been described using skin grafts, penile–scrotal skin flaps, or

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segments of the small or large intestine [4]. Some surgeons prefer the penile–scrotal skin flap technique, since penile skin is essentially hairless, less likely to contract, and leaves local nerves intact [2]. Complication rates of up to 32.5% have been reported, with the most common being urethral (14%) and neovaginal (9.8%) stenosis [2].

The second-most common technique is intestinal vaginoplasty, which uses a segment of the rectosigmoid colon or ileum to create the neovagina [4]. While intestinal vaginoplasty is not inferior to penile–scrotal flaps, its use is often reserved for revision vaginoplasty and patients with previous penectomy or penoscrotal hypoplasia [2, 4]. Overall complication rates of bowel neovaginal formation have been estimated at 6.4%, with the rate of neovaginal stenosis varying between 6 and 43% [4]. Managing complications after vaginoplasty can be challenging, as no universal guidelines and only limited training exist regarding treatment of these complications. Repair of neovaginal stenosis has been reported using mesh grafts or skin flaps and buccal mucosal grafts [2, 4].

In this video, we report a surgical procedure with the novel use of the biological graft Matristem™ for managing recurrent neovaginal stenosis due to granulation tissue following a rectosigmoid vaginoplasty. The use of extracellular matrix grafts has been previously described in the repair of a recurrent rectovaginal fistula [5]. We chose Matristem™, an extracellular porcine urinary bladder matrix (UBM) derived from the epithelial basement membrane and lamina propria of a porcine urinary bladder. This material acts both as a mechanical scaffold and promotes site-specific smooth-muscle and tissue-matrix regeneration [6–8]. UBM has been successfuly used to promote healing in the gastrointestinal tract, skeletal muscle, and genital tract. Moreover, it has been used to repair primary and recurrent anal fistulas with encouraging results [6], indicating it can be useful in augmenting complicated genital repairs without the need for an additional autologous tissue harvest site.

Method

A 32-year-old transwoman presented to us with neovaginal granulation tissue and stenosis of her neovaginal introitus 12 months after rectosigmoid vaginoplasty with an outside provider. The patient was obese, with a BMI of 41 and positive for human immunodeficiency virus with minimal viral load and normal CD4 counts. She denied cigarette smoking and was otherwise in good health. She underwent two surgical revisions of her neovaginal introitus, with our team using excision and cautery of the granulation tissue, respectively, but the patient developed recurrence of neovaginal granulation tissue and stenosis of introitus. This granulation tissue prevented sexual function of the neovagina and caused frequent bleeding, discharge, and discomfort during her attempts at neovaginal dilation. The patient was offered revision using a UBM graft and desired this procedure after discussion of the expected risks and benefits and disclosure of the novel nature of this approach. Informed consent was obtained from her prior to surgery for use of the procedural footage in video presentation; all video footage was deidentified. This video was recorded using a bed-mounted, high-definition telescopic camera with view of the surgical field.

On examination under anesthesia, adhesions across the midline were observed, with the neovaginal opening nearly obliterated by granulation tissue. Neovaginal length was 12 cm, but the opening had narrowed to 2 mm. A Foley catheter was placed in the urethra to identify urethra and bladder neck throughout the procedure. Granulation tissue at the entrance was lysed anteriorly and posteriorly in the midline using a combination of electrocautery and blunt dissection. Two mediolateral incisions were made at the 4- and 7-o'clock positions to further open the introitus, and granulation tissue was excised until healthy colonic tissue was reached proximally.

The Matristem™ UBM is available in several sizes. We cut the 7 × 10-cm sheet into tailored pieces to line the introital wound following tissue excision and introital widening. The crafted pieces were sutured over the wound bed using interrupted 2-0 Vicyl sutures, with knots tied external to the graft. We took care to maximize attachment points and contact between the graft and the patient's tissue to prevent dead space and promote graft function in tissue healing. The neovaginal introitus now allowed three surgeon fingers without constriction (3 cm wide × 3 cm anterior–posterior). The neourethra and urethral meatus was not disturbed, and cystoscopy at the completion of the procedure was negative for any lower urinary tract injuries.

The patient was discharged on postoperative day 1 with instructions to dilate the neovagina three times daily and apply genital estrogen cream daily. She was prescribed lidocaine gel to use as needed for comfort during neovaginal dilation and metronidazole orally due to high risk of microbial disturbance and odor and the large load of suture material.

Follow-up at 4 weeks showed good healing with population of the former wound bed with nongranulated epithelial tissue up to the level of the colonic tissue of the neovagina. The neovaginal introitus still allowed insertion of two gloved fingers. The patient had significant reduction of bleeding and significant decrease in pain and bloody discharge during dilation. She was noncompliant with consistent dilation in the months following the initial follow-up period. When seen again at 3 and 6 months after surgery, granulation tissue had resolved, but she noted neovaginal stenosis a few centimeters inside the neovaginal introitus. Clinical exams were consistent with loss of introital width at this 6-month follow up, although she maintained a 1-cm opening without recurrence of granulation tissue.

Conclusion

Management of complications after intestinal vaginoplasty in transgender women can be challenging. We present a novel surgical repair of recurrent neovaginal stenosis and granulation tissue using porcine UBM, with some success in eliminating granulation tissue and promoting healthy introital tissue generation. While comfort, hygiene, and quality of life improved with the procedure, noncompliance with a dilation schedule undermined the successful increase in size of the introitus and developed recurrent neovaginal stenosis 6 months following surgery. As this is a report of only one case, we recognize that limited conclusions can be drawn about the overall possible success of this procedure. We recommend that surgeons considering using this technique provide informed consent that includes information regarding its novelty and nature and education on hygiene and dilation consistency to optimize results and patient partnering.

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Compliance with ethical standards

Conflicts of interest Kate Meriwether is an author and editor for Elsevier.

Consent Written informed consent was obtained from the patient for publication of this video article and any accompanying images.

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