Perineal reconstruction with double gracilis muscle flap in vulvar cancer. Case report and literature review

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Abstract

Different gynecological neoplasms, regardless of the clinical stage, may present recurrence despite the established treatment and require ultraradical surgical rescue by pelvic exenteration, with a high percentage of complications and impairment of quality of life, and sometimes generate perineal defects that require immediate reconstruction. Because of this, different methods have been used for the closure of the perineal wound as primary closure and rotation of pedicled flaps. The goals in the reconstruction are: To improve the quality of life, symmetry and sensitivity and, if possible, sexual function, so as to diminish the in-hospital stay and time in rehabilitation for extensive wounds. The gracilis myocutaneous flap is possible because of its vascular pedicle based on the circumflex femoral medial artery with sensory innervation through the cutaneous femoral nerves or branches of the obturator nerve. The defect in vulvar or anal neoplasms requires a negative surgical margin with an extensive perineal dissection, and the coverage with a single flap is not enough, so in 1984 the first bilateral was described. These flaps can even preserve sensitivity and allow additional reconstruction with a neovagina, so the approach of these patients requires to be multidisciplinary. We present the case of a 57-year-old female patient, with stage II vulvar cancer, initially treated with chemotherapy and radiotherapy concomitant with local disease progression, for which total pelvic exenteration with vulvectomy and perineal reconstruction with flap was proposed. Bilateral gracilis muscle.

Key words: Gracilis flap. Bilateral gracilis. Vulvar cancer. Pelvic exenteration.

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Introduction

Surgical treatment with pelvic exenteration was described by A. Brunswich in 1940 as an ultra-radical treatment for advanced tumors in the pelvis, where surgical en bloc surgical removal of the rectum and anus, urinary bladder, external and internal genitals and perineum is performed. Initially described as a palliative treatment, it should currently be regarded as radical surgery with curative intent; however, it continues to have high morbidity, which ranges from 18% to 67%, with complications in perineal tissues being one of them^{1,2}. To solve this problem, procedures ranging from primary closure to the placement of pediculated flaps have been used, with perineal zone morbidity being markedly decreased by up to 15.8% with the use of the myocutaneous anterior rectus abdominis flap^{2,3}. In 2016, Devulapalli carried out the first systematic review where primary closure versus the use of flaps was evaluated. The results validated that myocutaneous flaps decreased perineal complications; in addition, a higher rate of perineal complications was demonstrated in the primary closure group, from 15.3% to 60%, with a mean of 25.3%, in comparison with 0 to 16.7%, with a mean of 8.4%, in the group of reconstruction with myocutaneous flaps, with the difference being statistically significant².

Cutaneous flaps were used in 1960. Subsequently, one decade later, regional reconstruction with pediculated fasciocutaneous flaps was evaluated with better evolution. The goals that have been proposed for reconstruction are: to improve quality of life, preserve symmetry and sensitivity, and if possible, sexual function, as well as to reduce hospital length of stay and extensive wound rehabilitation time. Flaps based on random location have been used, such as the Limberg flap, as well as fasciocutaneous or musculocutaneous flaps, such as the rectus abdominis and gracilis flaps, although there are others, such as the fascia lata tensor and the vastus lateralis or gluteal muscles⁴. The gracilis muscle flap is the most widely used, although there are others less used, such as fascia lata, rectus abdominis and gluteal flaps⁵. The gracilis muscle flap, described by McGraw in 1976, has the medial femoral circumflex artery as vascular pedicle, with sensitive innervation through cutaneous nerves or those deriving from the obturator nerve⁴.

To perform this procedure, the patient is placed in the lithotomy position with abduction of the thighs; the incision is made posterior to the long adductor muscle in order to expose the gracilis muscle, which is dissected

in distal direction to divide the muscle at its insertion in the medial tibial condyle, and then the vascular pedicle is dissected and preserved; finally, it is mobilized and, sometimes, it is tunneled to carry out the transposition towards the defect; circumferential suture of the flap with the pelvic floor is performed, with previous placement of a closed drainage in the empty space, from the soft tissues in multiple layers with absorbable suture and approximation of the skin with suture⁶. In 1984, the first description was published of the procedure carried out bilaterally at the Mayo Clinic to solve the problem, with adequate results⁷.

We present the case of a 57-year old woman with stage II vulvar cancer initially treated with chemotherapy and concomitant radiotherapy, with disease progression, which is why she was offered total pelvic exenteration with vulvectomy and perineal reconstruction based on a bilateral gracilis muscle flap.

Clinical case

This is the case of a 57-year old woman without relevant medical history, in whom present complaint had started two months prior, characterized by vaginal pruritus associated with pain. A biopsy taken on August 10, 2016, reported an invasive squamous cell carcinoma, which drove to her referral to this institution. Clinically, a 4-cm ulcerated tumor was found in the left major lip, which infiltrated the lower third of the vagina at the level of the introitus, with involvement of the anus and without affecting the urethra or rectum; both ingles were negative. The pathology material was reviewed and a new biopsy was performed, which confirmed the diagnosis. Studies for disease extension reported evidence of reactive left inguinal lymph nodes of 12 mm, although a fine-needle aspiration biopsy (FNAB) was negative for malignancy. She was referred for treatment based on chemotherapy and radiotherapy. She received external beam radiotherapy with a total dose of 50.4 Gy, concomitant with cisplatin and 5-fluorouracil (four cycles), which concluded on January 30, 2017. There was disease progression, which was confirmed by biopsy, as shown in [figure 1](#), and the decision was therefore made to perform total pelvic exenteration with total vulvectomy, ileal conduit (performing a continent urinary reservoir in the patient was not considered owing to the poor oncologic prognosis) ([Fig. 2](#)), terminal colostomy and reconstruction with bilateral gracilis ([Fig. 3](#)). Surgical time was 8 h, with 250-cc blood loss. There were no trans-surgical complications. Since the patient was hemodynamically stable, she was moved

Figure 1. Tumor persistence after chemotherapy and radiotherapy treatment conclusion.

Figure 2. Defect after pelvic exenteration was performed.

Figure 3. Reconstruction with bilateral gracilis musculocutaneous flap.

with no urine leaks or intestinal dehiscence and good tolerance to the oral route. Her hospital stay was 28 days, since she experienced persistent fever secondary to an abdominopelvic abscess, which was conservatively managed with antibiotics. The pathology report was: moderately differentiated squamous cell carcinoma, ulcerated, with extension to the vagina, of 7.5 cm at its longest diameter and 6-mm thickness, with perineural infiltration without lymphovascular involvement; surgical margins free of neoplasm.

Discussion

Cervical, vaginal or vulvar cancer can exhibit recurrence in spite of established oncologic treatment and require radical rescue surgery, with an extensive defect at the perineal level being produced, which requires immediate reconstruction. The most encouraging results regarding pelvic exenteration for gynecologic neoplasms have been obtained in cervix cancer; in the case of vulvar cancer, 5-year survival is lower than 40%¹³. The presented case was treated with chemotherapy and radiotherapy, although there was disease progression at treatment conclusion; documented progression in medical literature occurs in 14% of cases, as reported by Tans in an analysis of 28 patients with locally advanced vulvar cancer treated with chemotherapy and radiotherapy, with a 42-month follow-up, where 4 of 28 patients had disease progression¹². In our patient, pelvic exenteration was performed with palliative, rather than curative intent, with prognosis in the case of our patient therefore being even poorer owing to progression during the chemotherapy and radiotherapy treatment. In 1976, reconstruction using a unilateral gracilis musculocutaneous flap, since this muscle is outside the radiation fields, was first described; however, such large defects demand the use of multiple myocutaneous flaps or combinations of different areas. The gracilis muscle flap is the most widely used, although there are others less used such as fascia lata, rectus abdominis and gluteal flaps⁵, although these procedures imply great sacrifice in functions, longer dissection time and necrosis due to the long portion associated⁹. Therefore, to manage to cover such extensive defects, the bilateral use of the gracilis musculocutaneous flap has been considered since 1984, when Heath performed a vaginal functional reconstruction and closure of the extensive defect after pelvic exenteration using bilateral gracilis musculocutaneous flaps⁷. In 1999, Lai reported the vulvovaginal reconstruction of 12 patients undergoing surgery for

to the recovery ward and subsequently to the hospitalization area. Postoperative evolution was satisfactory,

gynecologic cancer with reconstruction, out of which three underwent reconstruction with gracilis musculocutaneous flap. Only one of these patients experienced perineal bleeding as complication 90 days after the procedure¹⁰. Up to 89% of patients undergoing this type of reconstruction have a previous history of radiotherapy², which increases the rate of complications from 14 to 40%⁸. In our patient, the use of transverse rectus abdominis musculocutaneous (TRAM) flap was initially considered for perineal reconstruction; however, due to the need to construct stomata for intestinal and urinary diversion in the abdomen, this option was ruled out.

In 2009, Wen-Ping reported a successful case of pelvic and perineal reconstruction based on bilateral gracilis musculocutaneous and rectus abdominis muscle flaps after perineal invasive mucinous adenocarcinoma en bloc excision in a male patient⁵; however, there are only few reported cases to this day where perineal reconstructions are performed for diseases at the vulvar level using bilateral gracilis musculocutaneous flaps.

It's important mentioning that the only study that conducted a systematic review, with a population of 566 patients, out of which 226 were reconstructed with flaps and 340 with primary closure, showed statistically significantly higher probability of complications in patients who underwent primary closure versus those undergoing reconstruction with flap, not so in minor complications, hospital length of stay or re-intervention rates².

Conclusion

Defects after salvage surgical procedures, or treatment for disease recurrence or persistence in patients with vulvar cancer can be completely reconstructed with bilateral gracilis myocutaneous flaps, with sensitivity even being preserved and with additional reconstruction of a neovagina. Major perineal complications

that have been reported in current medical literature demonstrate that these occur less frequently than with primary closures. The approach to these patients requires to be multidisciplinary, since the goals of these treatments are to improve quality of life, obtain better cosmetic results and preserve sexual function.

Conflict of interest

There are no conflicts of interests of any nature regarding the preparation and development of this document.

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