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Tensor fascia lata flap is a workhorse for defects after inguinal lymph node block dissection

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SUMMARY

Introduction Enlarged inguinal lymph nodes very often present a site of metastatic disease. Inguinal lymph node block dissection is a demanding procedure, which usually requires at least one of reconstructive modalities. Among different reconstruction options we selected the tensor fascia lata (TFL) musculocutaneous flap.

Objective The paper aims at presenting a series of inguinal block dissections, followed by immediate reconstruction, using the TFL flap, and evaluation of tumor type, flap dimension, complication rate and the duration of hospital stay.

Methods We present a consecutive case series of 25 conducted block dissections. The defects were reconstructed using TFL flap, because of the extent and site of the tissue defects, reliability of the flap, and potentially primarily infected exulcerated tumors.

Results The reconstruction was successful in all cases, the incidence of surgical complications was 16%, no further complications, such as lymphedema or gait disturbances, were noted. Primary skin tumors were predominant (13 cases), followed by genitalia tumors (four cases). The male sex was more frequently affected (14 vs. 11 cases).

Conclusion Having in mind that TFL presents as a flap of adjustable size, length, shape, and volume, with negligible donor site morbidity, and after comparing of our results to those of other authors, we advise broader use of TFL flap. As a reliable flap, not too difficult to harvest, with a low complication rate, it must be taken into consideration regarding the benefits for the patient, and, on the other hand, the surgery cost and duration.

Keywords: inguinal block dissection; reconstruction; tensor fascia lata flap

INTRODUCTION

Enlarged inguinal lymph nodes could be a site of primary disease (infection, Hodgkin or non-Hodgkin lymphoma), but more often they represent the site of secondary (metastatic) disease. Primary malignancy can usually be found on genitalia, perineum, buttocks, lower abdominal wall, anus (below the pectinate line), the thigh and the leg. There are two groups of inguinal lymph nodes – superficial and deep [1]. The inguinal dissection in metastatic disease should be properly performed to achieve optimal local control and minimize recurrence rate [2, 3].

Routinely, lymph node dissection is performed under general anesthesia, and consists of ablation of superficial and deep lymph nodes of the groin. In cases of extranodal spread, with skin metastases, a skin excision should be additionally performed, and such surgical procedure is named block dissection. This surgery leads to excessive soft tissue coverage deficiency and exposure of vital structures. Those facts underline the need for immediate reconstruction, which is performed according to the general rule of the "reconstructive ladder." Most often, the direct closure cannot be achieved. Exposure of the femoral vessels and nerves exclude the use of skin grafts. The reliable choice for immediate reconstruction would be the use of local flaps such as tensor fascia lata (TFL) flap [4], inferior based rectus abdominis flap [5, 6], or anterior thigh flap [6]. Some authors even recommend the prophylactic use of TFL in cases of ilioinguinal dissection [7]. However, postoperative complications are frequently reported, such as distal flap necrosis, or even, in some cases, compartment syndrome. Also, a controversy exists on the flap's safe dimensions to prevent such complications [8].

OBJECTIVE

We present a consecutive case series including 25 patients with inguinal block dissection and immediate reconstruction using the TFL flap. We evaluated the tumor type, flap dimensions, complication rate and the duration of hospital stays.

METHODS

This study was performed in the Clinic for Plastic and Reconstructive Surgery, Clinical Center Niš, Serbia. Over the period of 24 months from March 2012 to the end of March 2014, 25 TFL flaps were used for reconstruc-

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Figure 1. Metastatic disease of cervical cancer in the right groin

Figure 2. After block dissection, the tensor fascia lata flap was raised and donor site was closed primarily

tion of large groin defects following inguinal block dissection. The block dissection was accomplished by performing an excision of the skin affected by the metastatic disease (Figure 1), followed by ablation of underlying superficial and deep lymph nodes. All patients underwent primary reconstruction using TFL flap (Figure 2), and the active suction drain was routinely placed.

RESULTS

In our study we registered male predominance (14 vs. 11) and average age of the patients was 59.4 years. The primary site was the skin (squamous cell carcinoma or melanoma) in 13 cases, external genitalia in four cases, cervical (PVU) in three, large bowel in two cases. In three patients the location of the primary tumor was unknown.

All cases of block dissection also included the harvesting of the large saphenous vein. The defect size was between 12 × 20 cm and 15 × 25 cm. TFL flap was raised in retrograde manner and the flap size always achieved the defect requirements. Suction drain was in all cases removed on the fourth day. The complication rate and gender distribution is presented in Table 1.

The donor site was directly sutured in all the cases, with additional split-thickness skin grafting in five cases. There were no significant donor site complications, apart from partial skin graft loss in one case.

Figure 3. Postoperative result after three months

Table 1. Incidence of postoperative complications and gender distribution

Complication	Number of cases (n = 25)	
	Male patients % (n)	Female patients % (n)
Seroma/hematoma	4 (1)	4 (1)
Partial flap loss	4 (1)	0 (0)
Infection	0 (0)	0 (0)
Wound dehiscence	4 (1)	0 (0)
Cases without complications	44 (11)	40 (10)

Wound dehiscence and partial flap loss were secondary treated under local anesthesia.

Hospital stay was from six to 12 days, average being 10 days. After the wound healing we conducted a surgical primary follow-up (a two-month period) (Figure 3).

DISCUSSION

Reconstruction of large tissue defects has to be vigorously planned. There are several options to obtain the tissue continuum. According to the reconstructive ladder, the simplest choice would be the direct closure of the wound. The next step should be the reconstruction using split-thickness or full-thickness skin grafts. Because of the extent of the surgical procedure, and also the exposure of vital structures and postoperative treatment, these techniques could not have been used. The reconstruction was conducted by using the pedicled TFL flaps.

A variety of muscle and skin flaps have been described for the reconstruction of large groin defects, e.g. sartorius, rectus abdominis, rectus femoris, gracilis, abdominal skin flaps and TFL flap [9]. Potential disadvantages, as mentioned in the literature, would be the following: abdominal weakness, bulging or hernia (the use of rectus abdominis muscle flap) [10], lateral thigh paresthesia (the use of anterior thigh flap) [11], significant knee weakness (rectus femoris muscle flap) [12], large defect of the donor site and excessive bulkiness on the recipient site (use of muscular flaps in general) [12, 13, 14]. The consensus which flap represents the best suitable choice does not exist;

nevertheless, the use of local instead of free flaps, if possible, remains justified [15].

Tensor fascia lata flap is a myocutaneous flap, and as such many authors suggest it for coverage of large groin defects. It is based on the ascending branch of the lateral circumflex femoral artery, branch of the profunda femoris artery. The TFL muscle is a thin, flat muscle, with a single dominant vascular pedicle (Type I flap by Kormack Lamberty). The flap showed great success with relatively low donor site morbidity, compared to other flaps [13, 14, 16]. The advantages of the TFL flap would be the following: the involvement of well-vascularized tissue composed of thin sensate skin, thin subcutaneous tissue, and muscle, including large amount of durable fascia; long arch of rotation, and broad coverage area of up to 600 cm^2. The flap can be designed into the desired shape and volume, and it leaves very little functional deficiency. The muscle tissue, among others, possesses an important potential to aid the infection eradication. Thus, the TFL flap can also be used as an aid in handling of various infectious conditions, such as the exposure of osteomyelitic focus or infected prosthetic vascular graft [17].

The TFL flap-raising is not very demanding and the early postoperative radiotherapy can be promptly started as healing is fast, and hospital stay is not too long.

Some authors suggest the preservation of the great saphenous vein during the superficial groin dissection. This modification was retrospectively reviewed for metastatic vulvar cancer. A significantly reduced rate of cellulitis [18], wound dehiscence, and chronic lymph edema was found, and among other things it was shown that ligation of great saphenous vein did not significantly impact the development of mentioned complications, including the limb lymphedema formation, even on long-term follow-up [19]. In terms of vascular anatomy, as suggested by other authors, the vertical incision of the region should be placed 2 cm distal to the inguinal ligament to maintain the vascular supply, when possible, in order to prevent the tissue devascularization and consequent tissue necrosis [20].

Because of the oncological rule, great saphenous vein was harvested in all 25 cases in our study, but we did not register any significant lymphedema.

There are several possible complications expected after inguinal block dissection followed by primary TFL flap reconstruction. Partial flap loss, seroma/hematoma formation, infection or dehiscence could be expected. In our study there were two cases of seroma/hematoma formation, one case of partial flap loss, and one case of wound dehiscence. There was no clinically detectable functional morbidity like knee instability or gait disturbances in any of the cases in this study.

There are several predictors in terms of postoperative complications. The total number of removed lymph nodes presents the individual predicting factor for any complication, whereas the predicting factors for wound infection are AJCC stage, age, inguinal lymph node dissection followed by sartorius flap reconstruction, or surgery before 2008 [21]. Other authors presented to a certain extent similar findings: the direct association between the risk of grade 2 or higher (Clavien–Dindo classification) complications' occurrence, and body mass index, sartorius muscle transposition, and bilateral dissection [22].

The complications' rate is slightly lower comparing to other studies in which the TFL flap was used, probably because of the limitations of the study in terms of the number of cases and absence of preoperative tumor infections. In the literature diverse complications' rates were mentioned: partial flap necrosis of TFL flaps (0–16%), seroma formation (around 0–15%), wound dehiscence (up to 30%); infection rate ranged in some studies from somewhat similar to our results up to 24% of all cases. Hospital stay ranged from 10 to 16 days [22–26].

The opinion on use of surgical adhesives remains rather open. In some cases, for using one particular adhesive, as reported, a reduction of postoperative wound related complications, and thus the reduction of need for revision surgery, was clearly noted, whilst using another adhesive was, despite the initial promising results, slightly unsatisfactory [27].

The TFL flap presents a trustworthy and resourceful reconstruction option, which is undoubtedly less time-consuming, specifically for reconstruction of regions such as around the trochanter major, groin, lower abdomen, perineum, and around the ischial bone [28]. The use of free flaps in certain cases is clearly justified, particularly when harvesting local flaps is not possible. However, the vascular anastomosis is always at risk of thrombosis, especially in malignancy patients. The anastomosis is usually within the field of radiotherapy. In general, free flaps are more complicated for harvesting, operations last longer, and success of the surgery can be uncertain.

CONCLUSION

Presenting as a flap of adjustable size, length, shape and volume, with negligible donor site morbidity, and after comparing of our results to those of other authors, we advise the broader use of the TFL flap. Inguinal block dissection is the standard treatment of malignant deposits in the inguinal region involving skin. Wide local excision demands reconstruction according to the principles of plastic surgery. Tensor fascia lata local flap based on a single known vascular pedicle is a reliable flap, not too difficult to harvest, with a low complication rate, which must be taken into consideration regarding the benefits for the patient on the one hand and, on the other, the surgery cost and duration, as well as hospital stay costs.

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Режањ тензора фасције лате је решење за ткивне дефекте након ингвиналне блок дисекције

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Увод Увећани лимфни чворови често представљају место метастатске болести. Ингвинална блок дисекција је захтеван захват, након којег је најчешће неопходан бар један од реконструктивних модалитета. За реконструкцију дефекта одабран је тензор фасција лата мишићнокожни режањ.
Циљ рада Циљ рада је приказ серије ингвиналних блок дисекција праћених непосредном реконструкцијом режњем тензора фасције лате, као и процена типа тумора, величине режњева, броја и врсте компликација, као и дужине болничког лечења.
Методе рада Представљена је серија од 25 случајева блок дисекције. Дефекти су реконструисани режњем тензора фасције лате, који је одабран због величине и локализације дефекта, поузданости режња, као и због постојања потенцијално примарно инфицираних егзулцерисаних тумора.
Резултати Реконструкција је спроведена успешно код свих лечених пацијената. Инциденца хируршких компликација износила је 16%. Одложене компликације попут лимфедема или поремећаја ослонца нису забележене. Примарни кожни тумори су били најчешћи (13 случајева), праћени туморима гениталија (четири случаја), доминантно се радило о мушким пацијентима (14 вс. 11).
Закључак Као режањ прилагодљиве величине, дужине, облика и запремине, са занемарљивим морбидитетом на донорском месту, и након поређења са резултатима других аутора, препоручујемо чешћу употребу режња тензора фасције лате. Овај поуздани режањ, не превише компликован за препарацију, мора бити размотрен, узимајући у обзир корист за пацијента, као и, са друге стране, трошкове и трајање саме операције.
Кључне речи: ингвинална блок дисекција; реконструкција; режањ тензора фасције лате

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