Tensor fascia lata flap reconstruction in groin malignancy

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ABSTRACT

Introduction: Block dissection of inguinal lymph nodes is done in cases of malignant inguinal lymphadenopathy, which requires the removal of skin where it is involved, or elevation of the flaps which have precarious blood supply leading to necrosis. Thus, wound closure presents a big challenge. It can be done either by primary closure which is frequently complicated by necrosis, or by split thickness skin graft which is complicated by rejection on radiotherapy. Another option is to cover the wound by a vascularised pedicled graft. This prospective study was conducted after obtaining clearance from the ethical committee. The results were compared with the accepted complication rates of the operation.

Methods: We presented our experience of coverage of wounds after block dissection of inguinal lymph nodes for malignant deposits in 15 patients (with median age of 46 years) by pedicled tensor fascia lata thigh flap.

Results: The results following the surgery were good. Healing was satisfactory in all 15 cases. There were two cases of marginal flap necrosis, and three cases developed lymphoedema which was managed by stockings. There were two cases of infection which were settled by antibiotics. There were three cases of loss of a small area of skin graft at the donor site. There was no reported case of recurrence in the inguinal region.

Conclusion: This technique of coverage of the defect after inguinal block dissection is easy with predictable good results.

Keywords: groin malignancy, inguinal block dissection, tensor fascia lata flap, vascularised pedicled graft

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INTRODUCTION

Malignancy in the groin can be either a primary tumour or a manifestation of a malignant deposit at the inguinal lymph node (Fig.1). Malignant secondary deposit in the inguinal lymph nodes is common from the primary malignancy at the penis, vulva, anorectum and lower extremity. Some rare sites like the breast also metastasise to the inguinal lymph nodes. These deposits frequently involve the overlying subcutaneous tissue and skin. Metastatic deposits in the inguinal lymph nodes require block dissection where involved skin has to be sacrificed to maintain oncological principals of clearance (Fig. 2). Moreover, in cases where the skin is not involved, the vascular supply of the flaps is so precarious that necrosis of the skin is frequently encountered (Figs. 3 & 4). Apart from surgery, complete treatment of these patients requires postoperative radiotherapy, and the closure has to

Fig. 1 Photograph shows malignant deposit in the inguinal lymph node with involvement of the skin.

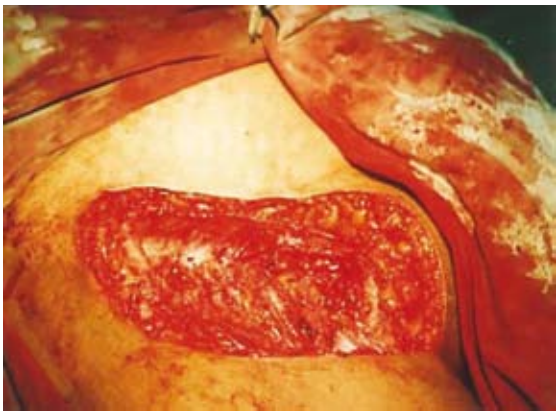

Fig. 2 Photograph shows a soft tissue defect resulting after block dissection was performed.

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Fig. 3 Photograph shows the primarily-closed wound after block dissection complicated by necrosis of the skin flap.

Fig. 4 Photograph shows a soft tissue defect resulting after debridement of the necrosed flap.

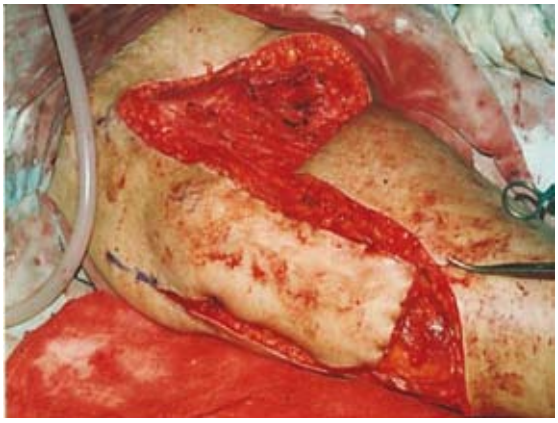

Fig. 5 Photograph shows the incision for the flap starts from the anterosuperior iliac spine to the lateral condyle of the tibia. Posteriorly the incision starts from the greater trochanter.

be planned meticulously so that the coverage can tolerate radiotherapy. Split thickness skin graft is frequently rejected after radiotherapy and this increases morbidity. Thus, a better option is coverage by a flap which can either be a free flap or a pedicled flap. The flap used for the coverage should have a known vascular supply which is outside the field of resection or radiation. The procedure should preferably be single-staged to reduce the hospital stay and for an early administration of postoperative radiotherapy.

METHODS

Patients attending the Surgery Outpatient Department and the Department of Plastic Surgery, Medical College Kolkata, West Bengal, India, with a malignant groin lump with skin involvement from January 2002 to May 2007 were identified. Of 15 patients, three were female where two had vulvar cancer and one breast cancer. Of 12 male patients, four had penile cancer, five melanoma of the foot, two anorectal cancer, and one congenital exstrophy of the bladder with squamous cell carcinoma at the age of 52 years. All the patients had fine-needle aspiration cytology (FNAC)-proven malignant deposits in the lymph nodes and the skin was involved in all the cases. Inguinal block dissection was carried out in all the patients with excision of the involved skin. This led to a large area of defect (Figs. 2 & 3). After excision, the great vessels in the inguinal region were laid bare.

The defect was covered with a tensor fascia lata (TFL) flap. This was carried out as a single-stage procedure in 14 cases. In the exstrophy case, as the flap was used to cover the anterior abdominal wall defect, the flap was released after six weeks, thus making it a two-staged procedure. The TFL flap is a myocutaneous flap based on the TFL,[1,2] which is a small, thin, flat muscle with a single dominant vascular pedicle from the ascending branch of the lateral circumflex artery, which is a branch of the profunda femoris artery (Type I flap). The flap can be raised as a standard flap with dimensions, 10 cm × 20 cm, or as an extended flap with dimensions, 15 cm × 40 cm, with a total coverage area of 600 cm^2. The anterior border of the flap was marked by drawing a line from the anterosuperior iliac spine to the lateral condyle of the tibia. The greater trochanter marks the posterior boundary. Superiorly, this flap can be taken from the iliac crest; inferiorly it should stop within 5–8 cm of the joint which is the point of entry of the perforator. The junction of the proximal and middle third is often the site of a perforator that pierces the TFL. This was marked and incorporated in the flap (Fig. 5).

For elevation of the flap, the skin incision was started at the lower border and continued at the medial and lateral borders. The wound was then deepened and the deep fascia was sutured to the skin to prevent shearing movements; the flap was then elevated off the vastus lateralis in a relatively avascular plane upwards and subfascially. The vascular pedicle was identified approximately 8–10 cm below the anterosuperior iliac spine, as it entered from

Fig. 6 Photograph shows the flap rotated and applied over the defect with a split thickness graft over the donor site.

Fig. 7 Photograph shows the coverage of the defect by skin graft after completion of the operation.

Fig. 8 Photograph shows the primary closure of the donor fascial defect.

Fig. 9 Photograph shows marginal necrosis of the flap.

the medial aspect. The flap was rotated to cover the defect either under a tunnel or directly in severe cases. The deep fascia was fixed by vicryl 3/0 interrupted sutures and the skin was closed by nylon sutures. The donor site was closed either primarily or with skin grafting (Figs. 6–8). The donor site was closed primarily in nine cases, while split thickness skin graft was required to close the donor site in six cases. Light dressing was applied on the flap. The dressing was removed the next day in the operation theatre to check the flap and a light dressing was applied. The dressing was removed completely on the seventh postoperative day. Coamoxyclavulonic acid was given in all cases for five days. No anticoagulation was required. Active physiotherapy was started on the third day in patients where the donor site was closed primarily. In cases where skin graft was used, the dressing was removed on the seventh day and active mobilisation was started from the eighth day in all cases.

RESULTS

In all 15 cases, healing was satisfactory (Figs. 6–8). There were two cases of distal marginal flap necrosis which was settled by conservative treatment (Fig. 9). We lost two cases during the three years of follow-up. Three cases developed lymphoedema which was managed by stockings. There were two cases of infection which was settled by antibiotics, and three cases of loss of the small area of skin graft at the donor site. This was managed conservatively. There was no reported case of recurrence in the inguinal region. All patients received postoperative radiotherapy, without any incidence of flap necrosis.

DISCUSSION

Inguinal block dissection is the standard treatment of malignant deposits in the inguinal region. This surgery is complicated most commonly by necrosis of the skin flaps (7.5%–62% of dissections).[3-7] The most common cause for poor healing and necrosis of the skin flap following groin dissection is poor vascularity of the flap. The vascular supply of the skin of the groin is from the superficial epigastric, superficial circumflex and superficial pudendal arteries, and these are all divided during groin dissection. This leads to compromised vascularity, leading to poor healing and flap necrosis. A variety of techniques have

been described by Turley et al for the reconstruction of groin defects, like split thickness skin graft and flaps.[8] However, various studies have concluded that none of them is ideal. Skin grafting is the simplest form of coverage, but it has several disadvantages. It has uncertain graft take. It commonly leads to hyperpigmentation and poor cosmetic results.[9] Moreover, rejection following radiotherapy is a big disadvantage in cases of malignancy. To overcome these complications, the use of a flap for coverage of the defect came into practice and was advocated by Budo et al[10] and Mathes and Nahai.[11] Muscle and myocutaneous flaps, although suitable for covering defects of the groin, led to defects at the donor site and a bulk at the recipient site (Gopinath et al, Hill et al and Bostwick et al)[1,12,13]

The problem of adding bulk to the recipient area was overcome by the use of a fasciocutaneous flap. This was practised by Pontén[14] and Maruyama et al.[15] The use of the TFH flap has the benefits of the myocutaneous flap without having any functional deformity at the donor site. Being a thin muscle, only a little bulk is added. The option of using free flaps has its own complications. The vascular anastomosis is always at risk of thrombosis. Moreover, patients with malignancy are already at an increased risk of thrombosis. The anastomosis is also within the field of radiotherapy. In this work, the use of the myocutaneous flap has certain advantages. The flap is large enough, with a wide arc of rotation and minimal anatomical variations. It is a type I pedicled flap with a reliable supply which lies away from the proposed site of radiotherapy. The presence of a consistent subcutaneous vascular plexus ensures a safe coverage defect by the skin and subcutaneous tissue on the iliotibial tract.[16] The subcutaneous pedicled TFL flap is a sensate flap with a thin skin, durable fascia, extensive reach and 360° arc of rotation, making it an appealing donor for coverage. It has a wide area of approximately 600 cm^2 of coverage, which can be moulded into the desired shape and volume. The dissection and rising of the flap is easy.[17] Early postoperative radiotherapy can be started as the healing is good and the hospital stay is shortened. The flap can also be combined with other local flaps and free flaps like the rectus femoris flap. As the muscle is an accessory flexor and medial rotator of the thigh, it leaves very little functional deficiency. There is no loss of function as other muscles take up and compensate for the function. In our cases, due to the proximity of the donor and recipient sites, we were able to use the preferred free flap tissue as a pedicled flap in the form of a TFL flap. This ensures all the benefits of the free tissue transfer without the use of microsurgical tissue transfer techniques and its associated logistic problems.

In conclusion, wide local excision including block dissection of the lymph nodes, forms the mainstay of surgical management of metastatic groin deposit with skin involvement. In this study of pedicled TFL flaps based on a single known vascular pedicle for the reconstruction of groin defects, we found it to be a reliable flap of good pedicle length, and adjustable size, shape and volume which can be combined with other local flaps (e.g. rectus femoris muscle flap). It also fulfils the required criteria for adequate coverage that can withstand postoperative radiotherapy. Moreover, the donor site can easily be managed without causing any functional defect.

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