

# Pedicated Gracilis Myocutaneous Flap Coverage in Metastatic Inguinal Lymphadenectomy: A Case Series

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**Abstract:** *This case series evaluates the use of pedicled gracilis myocutaneous flap for reconstructing inguinal defects following enbloc lymphadenectomy in patients with metastatic inguinal lymphadenopathy secondary to cutaneous, colorectal, and genital malignancies. Six patients were treated between February 2021 and March 2024 at Queen Elizabeth Hospital, Sabah. The procedure provided adequate coverage and bulk to the inguinal defect, facilitating further treatment. The outcomes suggest that this technique is effective for managing complex inguinal defects with minimal complications.*

**Keywords:** pedicled gracilis myocutaneous flap, metastatic inguinal lymphadenopathy, lymphadenectomy, groin reconstruction, surgical oncology

## 1. Introduction

Lymph node involvement commonly occurs in advanced stages of skin appendage tumours, melanomas, genital and anorectal cancers. And these are often fungating in nature[1]. Surgery may be curative or palliative depending on other organ or regional lymph node involvement. Inguinal node dissection has been always associated with a high incidence of wound complications. The risk and complications after Inguinal en-bloc dissection include infection (6–20%), lymphorrhea (6–40%), lymphedema (8–69%) and skin flap necrosis (27–85%)[2]. To reduce complications-related to wound healing, various primary reconstructive procedures such as muscle transposition and myocutaneous flaps are used for groin reconstruction. The purpose of this article is to present a case series demonstrating the effectiveness of the pedicled gracilis myocutaneous flap in reconstructing inguinal defects following enbloc lymphadenectomy in patients with metastatic inguinal lymphadenopathy.

## 2. Case Presentation

### Case 1

A man in his early 70s, presented with a fungating and bleeding left inguinal nodal metastases. He had previously undergone a below knee amputation for malignant melanoma. Patient underwent palliative en-bloc lymphadenectomy and covered primarily with pedicled gracilis myocutaneous flap. [figures 1a, b, and c]

### Case 2

A man in his late 50s, presented multiple cutaneous swelling over the abdominal wall and right inguinal mass with size 8x10cm secondary to an acral melanoma of the right big toe. The patient underwent right inguinal clearance with enbloc resection and a pedicled gracilis myocutaneous flap, followed

by tumor resection over the toe, as he did not agree with disarticulation of the toe. [figures 2a, b, c and d]

### Case 3

A 62 years old man, presented with left inguinal ulcerated swelling about size 5 x4 cm, and wound gapping over above knee amputation stump. He had an above knee amputation for a left leg marjolin ulcer and osteomyelitis tibia from a burn injury a year ago. [figures 3a, b, c, and d]

### Case 4

A man in his early 60s, who had a recurrent fungating mass over right inguinal region for colorectal adenocarcinoma. An abdominal perineal resection and adjuvant radiotherapy had been done prior to his referral to us. The fungating mass was about 10x6cm and was resected with the sartorius muscle and a branch of superficial femoral artery as an en-bloc resection. [figures 4a, b, c, and d]

### Case 5

A woman in her early 60s, presented with a foul smelling left inguinal tumor, measuring 10x5cm. These metastatic nodes were from an acral lentiginous melanoma of the left big toe which for which a disarticulation was done a year ago. [ figures 5a,b,c,d, e and f]

### Case 6

A man, 70years old, presented with fungating right gluteal mass a year after resection of his right thigh squamous cell carcinoma, he had done en-bloc resection and the defect was covered by a pedicled gracilis myocutaneous flap [Figure 6a, b and c]. wound healed well.

### 3. Treatment

Surgery was performed under general or regional anesthesia with the patient in the supine position by Orthopedic Oncology team. The soft tissue defect following block dissection was marked and measured, and the flap was planned. The lower limb was then placed in a figure -of-four position. In this position, the adductor longus is taut and easily palpable.

A longitudinal line is drawn from the posterior border of the adductor longus muscle to the medial condyle of the femur. Its pedicled supply can be identified about 8cm to 10cm from the pubic tubercle, just posterior to the adductor longus and above the gracilis. The pedicled gracilis myocutaneous flap is then planned from the medial aspect of the thigh, utilizing the skin over the distal half part of the superior third of the muscle. This skin can be extended to incorporate the proximal half of the middle third of the muscle, depending on the size of the defect. (Figure7) The skin island can be extended anterior and posteriorly between rectus femoris anteriorly and biceps femoris posteriorly. The flap is elevated from the anterior border, direct from the skin to the deep fascia, and separated together with the gracilis. We use non-absorbable 3-0 sutures along the skin flap edges to prevent shearing forces that would jeopardize the vascularity of the skin. The gracilis is then detached from its insertion distally. This distal gracilis tendon is anchored to the lateral border of the inguinal ligament near the anterior superior iliac spine, while the myocutaneous part covers the defect. A drain is inserted and kept until the flap edges epithelialize. All donor sites were primarily closed.

### 4. Outcome and Follow-Up

All 6 patients presented with metastatic lymphadenopathy. There were 5 male and 1 female patient. Their ages ranged from 58 to 76 years with a mean of 63.2 years. The defect sizes ranged from 9cm × 5 cm to 15cm × 10 cm. Postoperatively, there was no flap failure or flap revision surgery. One patient developed a wound gap due to cutaneous metastasis over the flap. Drains were removed between 3 to 7 days and sutures were removed on the 14th postoperative day. 2 patients passed away and 4 patients are still alive (Figure7). Out of these 4 patients, one is the one with cutaneous metastasis in the flap area, and the other three are disease-free.

### 5. Discussion

Orticochea first described the gracilis flap as a pedicled myocutaneous flap in 1972[3]. His work was expanded upon, and in 1976 Harri published a series of free gracilis flaps for various soft tissue injuries [4]. The complications of free gracilis flap may be skin necrosis, partial flap loss, and major flap failure. One study of extremity trauma and reconstruction with free gracilis muscle transfer showed higher generalized complications with increasing age >70 and ASA score. Higher ASA score also correlated with increased major flap complications [5]. The reconstruction of defects in the inguinal region with the aid of flaps allows for faster postoperative

recovery and reduces the risk of complications. Thus, the patient will be able to undergo potential necessary adjuvant treatments sooner [6].

Inguinal node dissection has always been associated with a high incidence of wound complications [2]. To reduce complications related to wound healing, various primary reconstructive procedures such as muscle transposition and myocutaneous flaps are used for groin reconstruction.

After surgery, these patients may require adjuvant radiotherapy and chemotherapy, thus primary reconstruction of the groin and stable skin coverage should be considered for patients undergoing ilio-inguinal node dissection. Stable skin coverage provides important protection for the femoral vessels, coverage of the dead space in the femoral triangle, a decrease in seroma formation, wound closure without tension and enables initiation of systemic therapy or local radiation as early as possible, and a decrease in the length of the hospital stay [6,7].

Reconstructive options available for coverage of inguinal defects include the random pattern flap, the tensor fascia lata (TFL) flap, the perforator propeller-type TFL flap, the modified TFL flap, the gracilis and sartorius flaps, the anterolateral thigh flap, the omental flap, the rectus femoris flap and the rectus abdominis flap[8,9]. Skin grafting is not sufficient for stable coverage over exposed bones, nerves and vessels. Free tissue transfer requires microsurgical expertise and long surgery time may overburden patients in critical conditions with progressive malignant disease. In such situations, skin flap with a simple and reliable technique with minimal donor site morbidity is ideal and would fulfil treatment goals.

Gracilis myocutaneous flap was originally developed as a musculocutaneous coverage option for lower extremity and perineal soft tissue defects, as an alternative to delayed healing of these open wounds[6]. More recently, the retroflexed gracilis muscle flap was reported as a method to provide viable tissue coverage of the femoral vessels after complications of vascular surgery such as groin wound[7]. In the present study, a pedicled gracilis myocutaneous flap was used to provide stable soft tissue coverage over the femoral vessels. The wound healed primarily with no significant donor site morbidity when compared to other flaps. The gracilis myocutaneous flap is less bulky than other myocutaneous flaps. A disadvantage of the gracilis myocutaneous flap is the high rate of skin-island necrosis, which is related to the low number of perforating vessels. The rate of necrosis has been reported to range from 6.8% to 38%[10,11]. However, this has not happened in our cases, probably because of our harvest technique and location of the skin paddle. The technique is simple, with a short operating time (approximately 50–60 min), and appears to be a reliable flap for coverage of the femoral vessels and inguinal region with good tolerance to radiotherapy.

### 6. Conclusion

The pedicled gracilis myocutaneous flap is an effective and reliable technique for the closure of inguinal defects in patients

with metastatic lymphadenopathy. This method offers several advantages, including reduced complication rates and enhanced postoperative recovery, making it a valuable option in surgical oncology. Further research with larger sample sizes is recommended to validate these findings and explore additional benefits.

- Metastatic inguinal lymphadenopathy is able to excise as en-bloc and primarily reconstructing by pedicled gracilis myocutaneous flap with excellent results.
- Pedicled gracilis myocutaneous flap a reliable flap for coverage of the femoral vessels and inguinal region with good tolerance to radiotherapy.
- The technique is simple, with a short operating time.

**Learning Points**

- Advanced stage of skin malignancy in extremity usually associated with inguinal lymphadenopathy causing skin defect

**Figures:**



**Figures 1a:** pre-operative image. Ulcerated left inguinal swelling.

**Figures 1b and 1c:** post- operative images. Pedicled gracilis flap used and donor site able to close primarily.



**Figures 2a and 2b:** pre-operative image.

**Figures 2c and 2d:** post-operative image (groin and medial thigh)



**Figures 3a:** pre-operative wound lesion.

**Figure 3b and 3c:** post operative images (anterior and medial view)

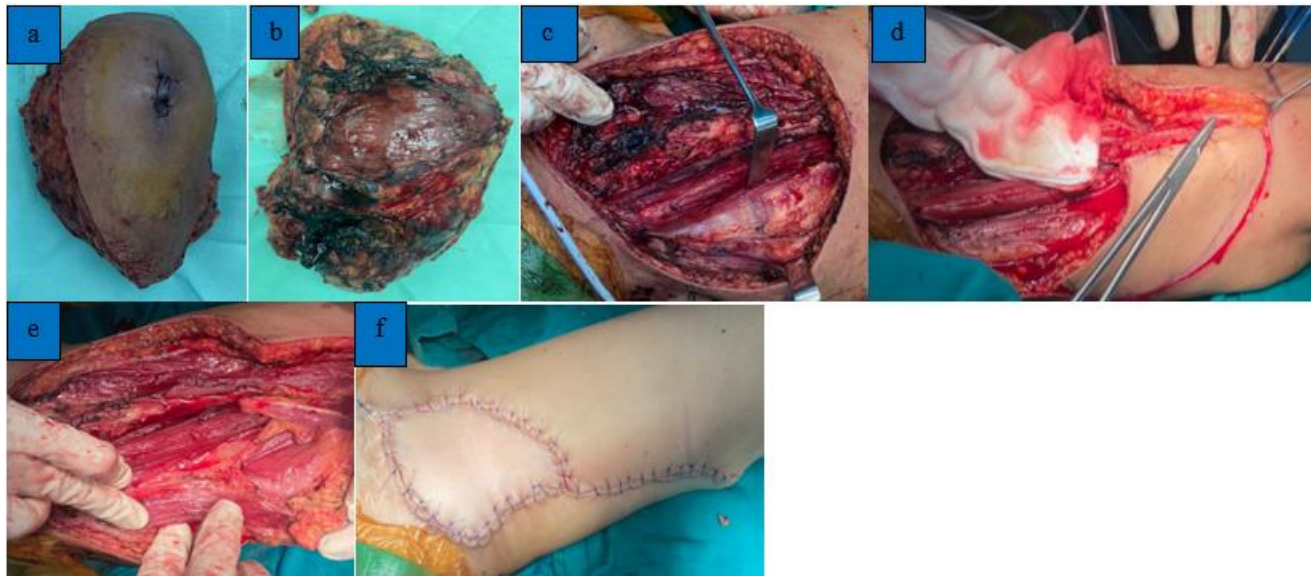
**Figure 3d:** wound image 3 weeks post operation.



**Figure 4a:** Pre-operative lesion and operation planning.

**Figure 4b and 4c:** Intra- operative images after raise the flap. Superficial femoral vessels were exposed at the wound base.

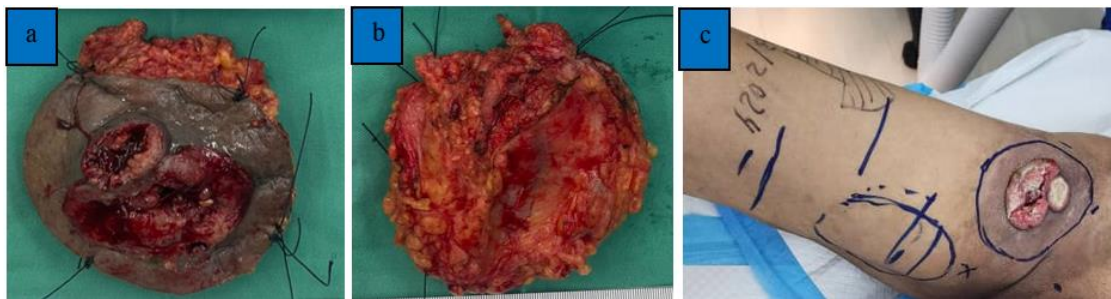
**Figure 4d:** Intra-operative image after wound closure.



**Figure 5a and 5b:** Intra-operative images (En-bloc excision of inguinal lymph node)

**Figure 5c,5d and 5e:** Intra-operative images showing identification of vascular pedicle, elevation of flap and separation of gracilis muscle from adductor longus)

**Figure 5f:** Intra-operative image after wound closure.



**Figure 6a and 6b:** intra-operative images. (En-bloc excision of inguinal lymph node)

**Figure 6c:** pre operative operation planning

**Figure7:** Summary of cases, diagnosis, skin defect size and outcome.

Patient No.	Age/Sex	Defect area	Diagnosis	Defect Area (cm)	Flap failure/. revision	Complication	Outcome
1.	76/M	Left Inguinal Lymph Node	Malignant Melanoma	10x8	No	No	Alive
2.	58/M	Right Inguinal Lymph Node	Acral Melanoma	10x9	No	No	Passed away
3.	62/M	Left Inguinal Lymph Node	Marjolin Ulcer With Osteomyelitis Changes	9x5	No	No	Alive
4.	61/M	Right Inguinal Lymph Node	Colorectal adenocarcinoma	11x10	No	Wound Gapping Due To Cutaneous Metastasis	Alive
5.	62/F	Left Inguinal Lymph Node	Acral Lentiginous Melanoma	15x10	No	No	Passed away
6.	70/M	Right Inguinal Lymph Node	Squamous Cell Carcinoma	9x10	No	No	Alive

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## Author Profile



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