

# JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH

How to cite this article:

PURKAYASTHA J LATERAL GASTROCNEMIUS MUSCLE FLAP FOR COVER OF LARGE POPLITEAL FOSSA DEFECT FOLLOWING RESECTION OF MARJOLIN'S ULCER. *Journal of Clinical and Diagnostic Research* [serial online] 2008 April [cited: 2008 Apr 7]; 2:751-753.

Available from

[http://www.jcdr.net/back\\_issues.asp?issn=0973-709x&year=2007&month=April&volume=2&issue=2&page=751-753&id=174](http://www.jcdr.net/back_issues.asp?issn=0973-709x&year=2007&month=April&volume=2&issue=2&page=751-753&id=174)

## CASE REPORT

# Lateral Gastrocnemius Muscle Flap for Cover of Large Popliteal Fossa Defect following Resection of Marjolin's Ulcer

PURKAYASTHA J

### ABSTRACT

Marjolin's ulcer rarely involves the popliteal fossa. The problem in the surgical management of such lesions lies in the soft tissue cover of the post resection defects. We describe our technique to cover such post surgical defects by utilising the gastrocnemius muscle flap along with split skin graft .

#### Key messages :

Limb salvage surgery for Marjolin's ulcer involving the popliteal fossa can be done by using the gastrocnemius muscle flap for cover of extensive post resection defects.

**Key Words :** Marjolin's ulcer, Popliteal fossa, Gastrocnemius muscle flap

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### Introduction

Marjolin's ulcer is an aggressive cutaneous malignancy that arises in previously traumatized or chronically inflamed skin, particularly after burns [1]. The association between thermal burn scar and neoplasia was initially recognised by Celsus in the first century[1]. However, the French physician Jean Nicholas Marjolin is credited with the first description of tumour arising in burn scar [2]. The area around the knee, including the popliteal fossa, is susceptible to burn injury which may cicatrise and lead the formation of Marjolin's ulcer. An aggressive combined approach with surgery and post operative radiation therapy is the recommended treatment for Marjolin's ulcer[3]. Radical surgical resection in the popliteal fossa with a safe margin may lead to extensive soft tissue loss with exposure of the neurovascular bundle. Soft tissue cover for such large defects in the popliteal fossa region is difficult because of its anatomical location. The lateral gastrocnemius muscle flap has rarely been used for cover of post surgical resection defects in the popliteal fossa.

### Patients and Methods

This operative technique was utilised for 2 patients who presented with Marjolin's ulcer of the popliteal fossa. The first patient was a 35 years old male who presented with an ulcer in the right popliteal fossa of 6 months duration. He had a thermal burn injury 23 years ago. The second patient was a 50 years old female, who also had an ulcer in the right popliteal fossa for 4 months and which occurred in an area of burn injury that was sustained 25 years ago. The initial burn injuries were treated conservatively and healed by secondary intention. The ulcers developed in the region of the post burn scar.

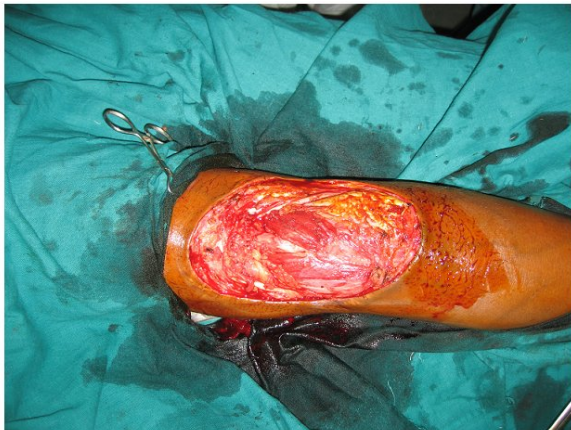
On examination, there were large ulceroproliferative growths involving the popliteal fossa with an average measurement of 12 x 6 cms [Table/Fig 1]. The ulcers were not fixed to underlying structures and there was no loco-regional lymph nodal enlargement.



Table/Fig 1 : Large marjolin's ulcer involving the right popliteal fossa.

Biopsy of the lesions revealed a well differentiated Squamous cell carcinoma. X-ray knee area did not show any bone or joint involvement and there was no systemic metastasis.

**Operative technique:** Both the patients were taken up for surgery under spinal anesthesia. The growth was excised with a 2 cms three dimensional margin. There was a large post resection defect measuring 14 x 8 cms on an average [Table/Fig 2]. The neuro-vascular bundle in the popliteal fossa got exposed.



Table/Fig 2 : Large defect in the popliteal fossa following radical resection. The exposed nerves are seen.

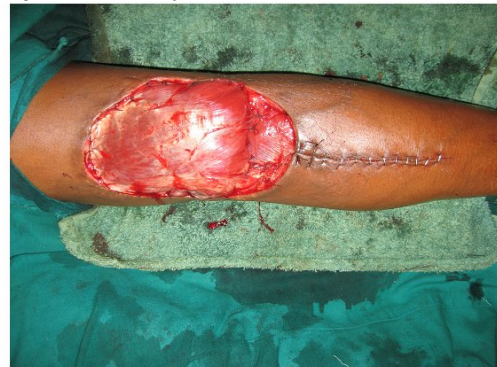
The defects was repaired by utilising the lateral gastrocnemius muscle flap. The gastrocnemius muscle was exposed by an incision in the middle of the calf (stocking seam incision). The lateral head of gastrocnemius muscle was mobilised by detaching it from the common tendon [Table/Fig 3]. It was then rotated 180° on its origin, based on the lateral sural vessel and sutured to cover the defect [Table/Fig 4]. The muscle was covered by split skin graft [Table/Fig 5].



Table/Fig 3: The lateral gastrocnemius muscle flap being developed after dividing its insertion and mobilising the muscle. The stocking seam incision for exposure of the muscle seen.

## Results

The wounds healed primarily in both the patients without any complication. The final histopathological examination revealed well differentiated squamous cell carcinoma with negative surgical margins. The patients underwent post operative radiation therapy to a total dose of 50 Gray. Both the patients are disease free at a follow up period of 12 and 15 months respectively. Moreover, there is no restriction of knee joint mobility and function.



Table/Fig 4: The muscle flap rotated based upon its pedicle and sutured to cover the popliteal fossa defect



Table/Fig 5: The muscle flap covered by split skin graft. The wound healed primarily. The donor area for skin graft in the left thigh seen.

## Discussion

Marjolin's ulcer commonly occurs in post burn scars but is also used to describe malignant tumours arising in many different types of

cutaneous scars and chronic wounds such as chronic venous ulcers, pressure ulcers, osteomyelitis sinuses, urinary fistulas, post traumatic and radiation scars [1],[2]. It has a predilection for the extremities particularly the lower extremity which is involved in about 40 % of cases [2]. The flexion crease of the extremities are particularly vulnerable because of decreased blood supply and more susceptibility to trauma [1]. Chronic wounds or scars in the popliteal fossa region may lead to the development of Marjolin's ulcer. The malignant transformation occurs after a latent period of 24 to 40 years from the time of the primary burn injury [1].

Aggressive surgery with at least 2 cms margin followed by post operative radiation therapy especially for large (> 5cms ) tumour is the preferred treatment for Marjolin's ulcer [1]-[4]. Amputation is reserved for deep lesions that extends to bone or joint cavities [1]. Adequate resection of large lesions involving the popliteal fossa leads to extensive soft tissue defects as happened in our patients. Soft tissue cover of large post surgical wounds in the popliteal fossa is difficult because of the anatomical location [5]. The commonly adapted procedure for cover of post resection defects of Marjolin's ulcer is split skin graft, because surrounding scar tissue precludes the use of loco-regional flaps [6]. But, skin grafting is not suitable for defects of the popliteal fossa because of the knee joint movement, more so if the neurovascular bundle is exposed as in our patients.

The lateral gastrocnemius muscle flap is a simple and easy to do procedure for cover of popliteal fossa defects. It was first described by Pers et al who utilised it for the cover of knee joint [7]. The muscle is supplied by the lateral sural artery, arising from the popliteal artery, which enters the muscle in the popliteal fossa close its origin [5]. The muscle can be harvested based on this vascular pedicle and can be used for reconstruction around the knee and in the lower thigh and upper leg [8].

The pedicled gastrocnemius muscle flap has mostly been used for closure of knee joint defects [7]. It has not been frequently used for closure of popliteal fossa defects. Its utility in cover of popliteal fossa defects was described by Podlewski, who repaired a shot gun injury sustained in the popliteal fossa [9]. However, this muscle flap has not been used for cover of defects following resection of Marjolin's ulcer. We have used this flap for cover of large defects in the popliteal fossa following radical resection of Marjolin's ulcer and have obtained good results.

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