









**Figure 6:** Below knee amputation flap

## 5. Discussion

Jean Nicholas Marjolin (1780-1850) a French surgeon described the development of carcinomatous ulcers in scars in 1828<sup>2</sup>. Squamous cell carcinomas (SCC) that arise in burn scar or a chronic, open wound overlying osteomyelitis is often referred to as a Marjolin's ulcer<sup>5</sup>. The various etiologic mechanisms for these tumors include release of local toxins following injury, induction of dormant neoplastic cells and induction of injury-induced preneoplastic cells by cocarcinogen<sup>6</sup>. Marjolin's ulcer is usually seen in low socio-economic societies with limited access to medical facilities. Most of the cases are from developing countries with late presentations. Malignant change seems to be prevented if early wound closure is undertaken<sup>7</sup>. Anatomically there is a preponderance of lesions on the extremities<sup>8</sup>. The Incidence of malignant tumors in chronic ulcer is 2%, and the incidence of squamous cell carcinoma (SCC) as the cause of the malignant tumor is 0.4% which is greater than the general population<sup>9</sup>.

Malignant transformation occurs usually after a long period of latency of chronic infection; it takes approximately 35 years on average<sup>10</sup>. But acute cases arising within a year of injury have been reported<sup>4</sup>. Acute and Chronic types have been distinguished by the length of latency. Other than a discrepancy in lag time it appears unclear if there are any differences in the clinical, histological or prognosis between the acute and the chronic types<sup>11</sup>. Malignancy can be diagnosed by a edge biopsy. Squamous cell carcinoma is most common, although Basal cell carcinoma can occur and rare tumors such as Malignant Fibrous Histiocytoma, Sarcoma and Melanoma have been reported<sup>4</sup>. The tumors often are well differentiated and may arise in a background of pseudoepitheliomatous hyperplasia, making diagnosis difficult<sup>12</sup>. Well differentiated SCC exhibits polygonal squamous cells arranged in orderly lobules and exhibiting numerous large zones of keratinization ( Keratin Pearls)<sup>13</sup>. SCC arising in areas of chronic inflammation have a 10-30% rate of metastasis, whereas those arising not due to pre-existing inflammation or degeneration condition varies from 0.05-16%<sup>14</sup>. A Marjolin's ulcer should be considered when a

soft-tissue mass with a broad based skin ulcer shows a mass effect and invasion of the adjacent bone<sup>15</sup>. Classically a 2cm margin is reserved for primary SCC Marjolin ulcer and 2.5 cm for recurrent cases<sup>16</sup>. Malignancy mandates wide excision, with potential amputation if lesion is on an extremity. Prophylactic regional lymph node dissection has not improved survival, but Sentinel Lymph Node Biopsy is a promising modality to direct therapeutic node dissections and awaits validation in this population. On a selected basis, adjuvant radiation may be warranted<sup>4</sup>. Recurrence rates are high despite current treatment advances and long term follow up are warranted. Recurrences are almost always local but distal metastasis to lung, brain, liver have been reported<sup>7</sup>.

## 6. Conclusion

Marjolin's ulcer is the eponym used to describe carcinomatous change occurring at the edge of any longstanding benign ulcer irrespective of cause. A chronic ulcer unresponsive to dressings and simple treatments should be biopsied to rule out neoplastic change. This type of tumor is usually a squamous cell carcinoma .These cases typically appear decades after the original injury in wounds but acute cases arising within a year of injury can occur. Malignancy mandates wide excision, with potential amputation if lesion is on an extremity. Prophylactic lymph node dissection is not necessary. In this case marjolin's ulcer appeared within one year and in literature there are only very few cases reported, hence this is a rare case.

## References

- [1] Bailey and Love's Short Practice of Surgery, 24<sup>th</sup> edition, Chapter 15, Cysts Ulcers and Sinuses,p.208
- [2] Bailey and Love's Short Practice of Surgery, 24<sup>th</sup> edition. Chapter 59, Venous Disorders, p.968.
- [3] Bailey and Love's Short Practice of Surgery, 24<sup>th</sup> edition. Chapter 3, Wounds Tissue Repair and Scars, p.28.

- [4] James H. Holmes and David M. Heimbach. Schwartz's Principles of Surgery, 8<sup>th</sup> edition. Chapter 7, Burns, p.216.
- [5] Jennifer A. Wargo, M.D., Kenneth Tanabe, M.D., F.A.C.S. ACS Surgery Principles & Practice, 6<sup>th</sup> edition. Chapter 24, Malignant Skin Lesions, p.256.
- [6] Louis H. Barr MD and John W. Menard MD Cancer Volume 52, Issue 1, pages 173–175.
- [7] Vanessa Cochetto M.D., Paula Magrin M.D., Roberta Andrade de Paula M.D., Marcia Aide M.D., Leonardo Monte Razo M.D., Luciana Pantaleao M.D. Squamous cell carcinoma in chronic wound: Marjolin Ulcer Dermatology Online Journal 19(2):7.
- [8] T Giblin, K Pickrell, W Pitts, D Armstrong. Malignant degeneration in burn scars: Marjolin's ulcer - Ann Surg, 1965.
- [9] J Ahmad, N Galeas, O Alvarez . Marjolin Ulcers: Transformation of Chronic Venous Ulcers to Squamous Cell Carcinoma - JAMDA, 2014
- [10] Julia Steinrücken, Maria-Chiara Osterheld, Andrej Trampuz, Olivier Borens . Malignancy transformation of chronic osteomyelitis: description of 6 cases of Marjolin's ulcers. European Journal of Orthopaedic Surgery & Traumatology., Volume 22, Issue 6, pp 501-505. August 2012.
- [11] Chang, Jessica B. BS ; Kung, Theodore A. MD, Cederna, Paul S. MD, FACS . Acute Marjolin's Ulcers: A Nebulous Diagnosis Annals of Plastic Surgery: May 2014 - Volume 72 - Issue 5 - p 515-520.
- [12] Nigel Kirkham, Lever's Histopathology of the Skin. Chapter 29, Tumors & Cysts of the Epidermis, p.831
- [13] George F. Murphy M.D., Klaus Sellheyer M.D., Martin C. Mihm Jr M.D. Robbins and Cotran Pathologic Basis of Disease 7<sup>th</sup> edition. Chapter 25, The Skin, p.1242.
- [14] Valencia D. Thomas, Sumaira Z. Aasi, Lynn D. Wilson, David J. Lefflel. Devita, Hellman and Rosenberg's Cancer Principles & Practice of Oncology, Volume 2. Chapter 47, Cancer of the Skin, p.1875.
- [15] Cha JG, Yoo JH, Kim HK, Paik SH, Hong HS, Lee HK. Imaging of a Marjolin's Ulcer: A Case Report. J Korean Soc Radiol. Jun 2011;64(6):593-598.
- [16] Abdolazim Ghalambor. Marjolin ulcer: How much of safety margin needs resection along marjolin ulcer squamous cell carcinoma in recurrence cases. Pak J Med Sci May-June 2007; 23(3): 394-397.
- [17]