



MARJHOLIN ULCER: OVERVIEW

Dr. M.Athar¹ (Associate Professor), Dr. Vikrant Mishra², Dr. Ajay Kuamr³, Devesh⁴

^{1,2,3,4} Department of Surgery, GSVM, Medical College, Kanpur, India,

Conflicts of Interest: Nil

Corresponding author: Dr. Ajay Kuamr

Abstract:

Background: Marjholins ulcer is a rare disease with limited clinical recommendations regarding management of the lymph nodes.

Materials and Methods: A retrospective analyses of medical records of patients treated in a single unit with a diagnosis of Marjolin's ulcer was performed.

Results: During the study period, 18 patients were treated. Four patients had lymph node metastases at the time of presentation for which wide excision with lymph-node dissection done. 14 patients underwent wide excision with reconstruction. During the follow up out of 14 patient two patients developed local recurrence and 7 patients Lymph-node Mets. Metastases.

Conclusion: The node positivity rate in patients in post of follow-up much higher than reported in marjholins ulcer with a high-risk primary tumor but clinically negative groins. This argues against routine prophylactic inguinal ILND in patients with marjholins who are clinically NO.

Keywords: Chronic ulcers, cutaneous malignancy, Marjolin's ulcer, squamous cell carcinoma

INTRODUCTION

Marjolin's ulcer is a rare cutaneous malignancy. It was first described in 1828 by French surgeon, Scar carcinoma is also known as Marjolin's ulcer (fig 1), named after the French surgeon Marjolin who first described a tumor arising from burn scars in 1928 (1). Initially, the term 'Marjolin's ulcer' specifically referred to squamous cell carcinoma that developed after the malignant transformation of ulcers after a burn. However, as a result of in-depth study of the malignant transformation of other cellular components in scars after burns and case reports on the malignant transformation of scars caused by non-burn wounds, the current concept of Marjolin's ulcer encompasses all malignant tumors that primarily occur in body surface ulcers (1,2).

In terms of histopathological classification, Marjolin's ulcers now are classified into squamous cell carcinoma, basal cell carcinoma, melanoma, sarcoma and other rare cell types (2,3). The majority of Marjolin's ulcers are squamous cell carcinomas, followed by basal cell carcinoma and melanoma (1). The malignant transformation rate was reported as 1–2% (4).

In general, Marjolin's ulcer remains the most common type of malignancy occurring in deep partial-thickness or full-thickness burn wounds that do not receive any surgical treatment. Other causes include pressure sores, venous ulcers, chronic osteomyelitis, unhealed wounds resulting from various causes and scars that have undergone repeated ulceration (5). The disease course of Marjolin's ulcer is long and is usually accompanied by ulcer

formation. The typical Marjolin's ulcer is easy to diagnose based on a history of unhealed scar ulcers and characteristic local clinical presentations (6,7). At present, the most effective treatment method for Marjolin's ulcer is surgery. Radiotherapy is recommended for patients who cannot undergo surgery or is used for consolidation treatment after surgery. Chemotherapy is not generally considered an effective therapeutic method for Marjolin's ulcer.

Marjolin's ulcers have been described by numerous previous studies. However, due to the lack of large-scale studies, the reported aetiology and clinical characteristics, as well as treatment methods and effects vary considerably (5,10,11). For instance, the recurrence times of Marjolin's ulcers vary between studies; certain studies have reported the mean recurrence time of 4.66 ± 2.07 months, while others have reported recurrence times of 3–10 months with a mean of 5.4 months, and still others have reported recurrence in 6–11 months with a mean of 8.8 months (3,12–14). To further elucidate the features of this pathology.

Material and method

Inclusion criteria:

- All of the cases were confirmed by pathological examination
- Only data from the first hospitalization were collected.

Exclusion criteria:

- patients who were hospitalized several times due to recurrence,

The following factors of all patients were considered:

1. Demographic data, including gender, age and location of primary tumor
2. Clinical characteristics, including initial injury or primary disease, latency period, lesion location, lesion type, lesion area and pathological type;
3. lymph node metastasis of tumor cells;
4. Treatment methods and prognosis, mainly including the number of surgeries, surgical methods.

Results & observation:

18 patients with Marjolin's ulcer were treated in the above-mentioned study period of which 12 were males and 6 were females. The mean age of presentation was 50.0 ± 4.2 years (range 32-70 years). The duration from the time of insult to the development of cancer varied from 2 to 12 years (mean 4.8 ± 2.3 years). The lower limb (fig 1) was the most common site of Marjolin's ulcer. Of 18 cases, 2 cases of Marjolin's ulcer developed in chronic venous ulcer, one case in a patient after chronic trauma, 14 cases after burn injury, 1 case in a chronic decubitous ulcer.

Table 1: Clinical profile of marjholin ulcer and there management.(N=18)

Case no	Age/sex	Tumor location	Lymph node Mets	Duration of injury year	Surgical method	Follow-up results
1	37/F	Left calf	Negative	2	Extended resection with skin grafting	Inguinal lymph node positive for Mets
2	78/m	Rt foot	Negative	8	Extended resection with skin grafting	Follow-up presence
3	56/F	Left for arm	Negative	1	Extended resection with skin grafting	Local recurrence with Axillaries lymph node positive for Mets
4	44/m	Sacrum	Negative	4	Extended resection with rhomboid flap	Follow-up presence
5	58/m	Left thigh	Inguinal LN positive	6 month	Extended resection with skin grafting with block dissection	Follow-up presence
6	63/m	Rt popleteal fossa	Inguinal LN positive	7	Extended resection with skin grafting with block dissection	Follow-up presence
7	70/m	Rt foot	Negative	5	Extended resection with skin grafting	Inguinal and popleteal lymph node positive
8	66/m	Upper chest	Negative	2	Extended resection with skin grafting	Axillary lymphnode positive
9	59/F	Scalp	Negative	13	Extended resection with skin grafting	Follow-up presence
10	44/m	Rt shoulder	Axillary LN positive	4	Extended resection with skin grafting with block dissection	Follow-up presence
11	32/m	Left lower limb	Negative	63	Extended resection with skin grafting	Follow-up presence
12	67/m	Rt dorsum of foot	Negative	2	Extended resection with skin grafting	Inguinal lymph node positive
13	71/m	Rt calf	Negative	2	Extended resection with skin grafting	Local recurrence
14	49/F	Left great toe	Negative	3	Extended resection with skin grafting	Follow-up presence
15	55/F	Rt popleteal fossa	Inguinal LN positive	7	Extended resection with skin grafting with block dissection	Follow-up presence
16	57/m	Abdomen	Negative	5	Extended resection with skin grafting	Follow-up presence
17	43/m	Rt calf	Negative	4	Extended resection with skin grafting	Inguinal lymphnode positive
18	51/F	Rt sole	Negative	2	Extended resection with skin grafting	Inguinal and popleteal lymphnode positive

Squamous cell carcinomas were located on the lower limb in 12 cases, the upper limb in 2 cases, the head in one cases and the chest in one case and one case in abdomen and one case on sacrum area. (table 1)

The pathological type was squamous cell carcinoma in all 18 cases (100%), including 15 cases of well-differentiated squamous cell carcinoma (Broder's Grade I) and 3 case of moderately differentiated squamous cell carcinoma (Broders' Grade II).

The rate of metastasis varied among the pathological types. In patients with squamous cell carcinoma, the rate of lymph node metastasis at the time of presentation 22.22%

Table 2: Lesion area with respect to no. of patient.

Lesion area cm ²	N=18
<5	6
5 – 10	4
10 - 20	5
>20	3
Total	18

Most of the patient of Marjholin ulcer present to our side are $<20\text{cm}^2$

>20cm size of tumor rarely found. (table 2)

Table 3: Depth of invasion with respect to no. of patient

Depth of invasion	N=18
<1 mm	7
1-3 mm	6
3-5 mm	3
>5mm	2
Total	18

Depth of invasion of tumor are of >5mm are scarsed.(table 3)

Table 4: Distance from margin of scar with respect to patient

Distance from margin of scar	N=18
<1 cm	3
1-3cm	5
3-5cm	4
>5cm	6
Total	18

The study included 18 patient with marjholins ulcer. 14 patient did not receive an LND and 4 patient underwent

LND. Patients who received LND had significantly higher clinical T and clinical N stage. There was no difference in age, sex, or histology between those with LND versus no LND. Wide excision with split skin thickness graft (fig 3&4) was performed in 14 patients. During the follow-up period two patients developed local recurrence and 7 patients develop lymph node Mets (metachronous mets)

Surgical methods and follow-up results

The majority of the patients required only 1 surgery and only few patients required 2 or more surgeries. Depending on the condition of the lesion after resection, and lymph-node status.

Of the 18 patients with squamous cell carcinoma, Four patients had lymph node metastases at the time of presentation and they underwent lymph node dissection, 14 did not develop aggressive tumors or lymph node metastasis. These 14 patients underwent extended resection and skin grafting or skin flap repair (of which 1 patient underwent Rhomboid flap (fig 5&6). Seven patients developed with inguinal, popliteal or axillary lymph node metastasis (fig 2).



Figure 1: Marjolin ulcer of left lower leg



Figure 2: Axillary lymph-node in marjolin of rt arm



Figure 3: Resection with skin grafting on dorsum of foot



Figure 4: Resection with skin grafting on popliteal fossa



Figure 5: Marjolin ulcer on sacrum region



Figure 6: resection with rhomboid flap

Table 5: follow-up lymph-node status

Depth of invasion	Size of lesion (cm ²)	Distance of lesion from margin of scar	LN status
>5mm	>20	<1cm	5 Mets
3-5mm	10-20	1-3cm	2 Mets
1-3mm	5-10	3-5cm	Nil
<1mm	<5	>5cm	Nil

At follow-up period two patient found local recurrence, and seven patient develop Metachronous lymph node Mets who having size >10cm , DOI >3mm and distance from lesion <3cm.(table 5&6)

Table 6: characteristics'

Characteristics'	No. Of patients (n=18)
Mets at time of presentation	
Lymph node	4
Distant mets	1
Recurrence	
Local	2
Distant/ lymph node mets	7

Among the 18 Marjolin's ulcer patients who received follow-up, 2 had recurrence, including 1 cases with recurrence on lower limb, 1 cases on the upper limbs (table 1&6). No significant differences in the recurrence rates of Marjolin's ulcer on different body parts were identified according to the Kaplan-Meier survival analysis.

Discussion

The present study reported on cases of Marjolin's ulcer admitted and treated. Among these ... cases, squamous cell carcinoma was the major type of Marjolin's ulcer (1,2,5,9). However, a typical pathological type, malignant melanoma, which is common in Western countries (1,6), was not observed in the present study. A possible reason may be differences in ethnicity and a lack of long-term sunlight exposure among the population.

In addition, the male-to-female ratio, age at initial injury and age at the first onset observed in the present study were similar to those in certain previous studies (2,18).

Marjolin's ulcer may occur on any part of the body's surface, but they are commonly observed at specific sites. A previous study reported that the lower limbs are the most common site, followed by the head and neck, upper limbs, trunk, hips and perineum (14). The predilection sites of Marjolin's ulcer in the present study were similar to those in other studies. The histological type of Marjolin's ulcers in our study mainly squamous cell carcinoma.

In general, Marjolin's ulcer does not easily metastasize for a considerable amount of time after their onset. The lymphatic system is the primary pathway of metastasis. At present, it remains controversial whether preventive lymph node dissection should be performed for Marjolin's ulcer patients (19). It is generally considered that preventive lymph node dissection does not have any obvious influence on tumor recurrence and should not be performed for this purpose (13). However, according to certain studies, the metastatic rate of lymph nodes in the lower limb region is relatively high, and for cases of Marjolin's ulcer without lymph node metastasis in the lower limb region, preventive lymph node dissection should be considered (20). It has also been proposed that the level of tissue differentiation may be used as a basis for determining whether preventive local lymph node dissection should be performed (21). Studies from other countries have reported a rate of metastasis of Marjolin's ulcer in local lymph nodes of 22% (2). However, a recent study from China indicated that among 187 patients with lymph node enlargement, 64 underwent local lymph node dissection and only 18 developed tumor cell metastasis to the lymph nodes (9). During the treatment of the 14 patients in the present study, only 7 patients developed lymph node metastasis (50%), yielding a high metastatic

rate. In addition, after the surgical dissection of 4 cases of lymph node metastasis diagnosed by PET-CT, NO any cases were discovered to be positive.

Therefore, it appears reasonable that the decision to perform regional lymph node dissection should be done in old age patient, poorly differentiated tumor, large size, and tumor having depth of invasion >3mm.. Prophylactic lymph-node dissection should be performed based on a comprehensive evaluation, including the patient's systemic condition, tumor differentiation level, lesion location, wound size, invasion depth and lymph node imaging results.

After the excision of Marjolin's ulcer, wound repair and functional reconstruction are key to improving life quality. It is generally considered that skin graft repair should be used as much as possible. If bones and tendons are exposed, skin flap repair should be performed. Local skin flap repair should be used if possible, while island skin flap graft repair is the second most desirable alternative. Free skin flap repair should not be the common method of choice. Among the 18 patients who received surgery in the present study, 14 received skin grafts, 4 received local skin flap or island skin flap repair, and none underwent the complex free flap repair. These results indicate that skin grafting and simple skin flap repair are still the preferred methods for wound repair after extended resection of Marjolin's ulcer and provide the most satisfactory outcomes.

In the present study, the recurrence rates of Marjolin's ulcers in different locations did not exhibit any significant differences. This may be due to the limited sample size and the number of cases that were lost to follow-up. However, among the 2 cases of recurrence, 1 case in upper extremity and 1 case in lower extremity. Furthermore, the trend in recurrence time is another characteristic of Marjolin's ulcer. Various studies have reported that Marjolin's ulcer has a short recurrence time (12-14). However, the present study indicated that the recurrence time for Marjolin's ulcers was significantly longer than that reported in previous study suggesting that 1 year after surgery is the peak period of recurrence and patients should be closely followed up and observed. Furthermore, the recurrence rates in different body parts had no significant differences in the present study.

Conclusion:

the present retrospective study indicated that Marjolin's ulcer mainly occurred in males and was mainly scar carcinoma after burn. The pathological type was mainly squamous cell carcinoma. Autologous skin grafting and local skin flap repair were the major repair methods used.

The node positivity rate in patients in post of follow-up much higher than reported in marjholins ulcer with a high-

risk primary tumor but clinically negative groins. This argues against routine prophylactic inguinal ILND in patients with marjholins who are clinically N0.

Reference:

1. Onesti MG, Fino P, Fioramonti P, Amorosi V, Scuderi N. Ten years of experience in chronic ulcers and malignant transformation. *Int Wound J*. 2015;12:447–450. doi: 10.1111/iwj.12134. [PubMed] [CrossRef] [Google Scholar]
2. Das KK, Chakraborty A, Rahman A, Khandkar S. Incidences of malignancy in chronic burn scar ulcers: Experience from Bangladesh. *Burns*. 2015;41:1315–1321. doi: 10.1016/j.burns.2015.02.008. [PubMed] [CrossRef] [Google Scholar]
3. Hahn SB, Kim DJ, Jeon CH. Clinical study of Marjolin's ulcer. *Yonsei Med J*. 1990;31:234–241. doi:10.3349/ymj.1990.31.3.234. [PubMed] [CrossRef] [Google Scholar]
4. Chalya PL, Mabula JB, Rambau P, Mchembe MD, Kahima KJ, Chandika AB, Giiti G, Masalu N, Ssentongo R, Gilyoma JM. Marjolin's ulcers at a university teaching hospital in Northwestern Tanzania: A retrospective review of 56 cases. *World J Surg Oncol*. 2012;10:38. doi: 10.1186/1477-7819-10-38. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
5. Pekarek B, Buck S, Osher L. A comprehensive review on Marjolin's ulcers. *Diagnosis and treatment. J Am Col Certif Wound Spec*. 2011;3:60–64. [PMC free article] [PubMed] [Google Scholar]
6. Bazaliński D, Przybekmita J, Barańska B, Więch P. Marjolin's ulcer in chronic wounds-review of available literature. *Contemp Oncol*. 2017;21:197–202. [PMC free article] [PubMed] [Google Scholar]
7. Kheiri B, Osman M, Al Hadidi S. From a burn scar to malignancy! Marjolin's ulcer, a disease of wound neglect. *Oxf Med Case Reports*. 2018;2018:omy044. doi: 10.1093/omcr/omy044. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
8. Nthumba PM. Marjolin's ulcers: Theories, prognostic factors and their peculiarities in spina bifida patients. *World J Surg Oncol*. 2010;8:1–5. doi: 10.1186/1477-7819-8-108. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
9. Liu Z, Zhou Y, Zhang P, Zhang M, Ren L, Zeng J, Zhou J, Liang P, Huang X. Analysis of clinical characteristics of 187 patients with Marjolin's ulcers. *Zhonghua Shao Shang Za Zhi*. 2016;32:293–298. (In Chinese) [PubMed] [Google Scholar]
10. Sisti A, Pica Alfieri E, Cuomo R, Grimaldi L, Brandi C, Nisi G. Marjolin's ulcer arising in a burn scar. *J Burn Care Res*. 2018;39:636–639. [PubMed] [Google Scholar]
11. Fishman JR, Parker MG. Malignancy and chronic wounds: Marjolin's ulcer. *J Burn Care Rehabil*. 1991;12:218–23. doi: 10.1097/00004630-199105000-00004. [PubMed] [CrossRef] [Google Scholar]
12. Altunay I, Cerman AA, Sakiz D, Ates B. Marjolin's ulcer presenting with in-transit metastases: A case report and literature review. *Ann Dermatol*. 2015;27:442–445. doi: 10.5021/ad.2015.27.4.442. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
13. Choi JY, Bae YC, Nam SB, Bae SH. Impact of disturbed wound healing after surgery on the prognosis of Marjolin's ulcer. *Arc Plast Surg*. 2013;40:198–202. doi: 10.5999/aps.2013.40.3.198. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
14. Aydogdu E, Yildirim S, AkSz T. Is surgery an effective and adequate treatment in advanced Marjolin's ulcer? *Burns*. 2005;31:421–431. doi: 10.1016/j.burns.2005.02.008. [PubMed] [CrossRef] [Google Scholar]
15. Jellouli-Elloumi A, Kochbati L, Dhraief S, Ben Romdhane K, Maalej M. Cancers arising from burn scars: 62 cases. *Ann Dermatol Venereol*. 2003;130:413–416. [PubMed] [Google Scholar]
16. Fazeli MS, Lebaschi AH, Hajirostam M, Keramati MR. Marjolin's ulcer: Clinical and pathologic features of 83 cases and review of literature. *Med J Islam Repub Iran*. 2013;27:215–224. [PMC free article] [PubMed] [Google Scholar]
17. Shen R, Zhang J, Zhang F, DU Y, Liang W, Xu L, DU X, Chen P, Chen X. Clinical characteristics and therapeutic analysis of 51 patients with Marjolin's ulcers. *Exp Ther Med*. 2015;10:1364–1374. doi: 10.3892/etm.2015.2699. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
18. Yu N, Long X, Lujan-Hernandez JR, Hassan KZ, Bai M, Wang Y, Wang X, Zhao R. Marjolin's ulcer: A preventable malignancy arising from scars. *World J Surg Oncol*. 2013;11:313. doi: 10.1186/1477-7819-11-313. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
19. Fernandes MG, Brandão M, Dias EM. Marjolin's ulcer with axillary lymph node metastasis. *Acta Med Port*. 2018;31:515. doi: 10.20344/amp.10673. [PubMed] [CrossRef] [Google Scholar]
20. Dupree MT, Boyer JD, Cobb MW. Marjolin's ulcer arising in a burn scar. *Cutis*. 1998;62:49–51. [PubMed] [Google Scholar]
21. Ozek C, Celik N, Bilkay U, Akalin T, Erdem O, Cagdas A. Marjolin's ulcer of the scalp: Report of 5 cases and review of the literature. *J Burn Care Rehabil*. 2001;22:65–69. doi: 10.1097/00004630-200101000-00013. [PubMed] [CrossRef] [Google Scholar]