

Marjolin's Ulcer: A Retrospective Study of 28 Cases of Marjolin's Ulcer Due to Burn Injury and A Review of the Literature

MARJOLİN ÜLSERİ: YANIĞA BAĞLI 28 MARJOLİN ÜLSERLİ OLGUYU İÇEREN RET-ROSPİKTİF ÇALIŞMA VE LİTERATÜRÜN GÖZDEN GEÇİRİLMESİ

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Abstract

Objective: In this retrospective study, burn treatment modalities, natural progression, survival characteristics and recurrences of Marjolin's Ulcer were evaluated.

Material and Methods: A group of 28 cases diagnosed and treated in our department from 1993 to 2004 with the diagnosis of squamous cell carcinoma of the skin developing in areas of previously-burned skin were assessed by chart review.

Results: It was noticed that in none of the cases reviewed had surgical debridement or skin grafting been employed for the treatment of burn wounds. Simple application of local antibiotic ointments comprised treatment and the wounds healed by secondary intention. When these patients were diagnosed with Marjolin's Ulcer, most of them underwent tumor excision and split-thickness skin grafting. Lymph node dissections were performed only in those cases with palpable regional lymph nodes. During the follow-up period, three of these patients died due to cerebral metastasis. The majority of the cases showed no local recurrence or distant metastases.

Conclusion: Burn wounds require careful assessment and correct treatment, especially when the burn is deep. Surgeons should not hesitate to be aggressive and diligent in diagnosis and treatment, particularly when these patients present late.

Key Words: Burn, carcinoma

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Özet

Amaç: Bu retrospektif çalışma, Marjolin Ülser tanısı konan hastalarda ilk yanık tedavilerinin nasıl yapıldığı, skuamöz hücreli kanserin ne kadar süre sonra ortaya çıktığı ve hastaların demografik özellikleri ile bu hastalarda hastalığın doğal seyiri ortaya konmaya çalışılmıştır.

Gereç ve Yöntemler: Kliniğimizde 1993-2004 yılları arasında Marjolin Ülser tanısı ile tedavi gören 28 hastanın dosyaları incelenmiş ve bu hastalara ilişkin özellikler ve sürvi ile ilgili sap-tamalar yapılmıştır.

Bulgular: Çalışmaya dahil edilen hastaların hepsinde yanık tedavisinin konservatif olarak yapıldığı ve debridman, greftleme gibi tedavi yöntemlerinin uygulanmadığı saptandı. Skuamöz hücreli kanser tedavisi konan bu hastaların çoğunda eksizyon ve kısmi kalınlıkta deri grefti uygulanmıştır. Lenf nodu disseksiyonu sadece palpabl lenf nodu olan hastalara uygulanmıştır. Postoperatif dönemde serebral metastaz nedeniyle 3 hasta kaybedilmiştir. İzlem boyunca hastaların çoğunda lokal rekürrens ya da uzak metastaz saptanmamıştır.

Sonuç: Yanık yarasının derinlik açısından tanı konulması ve tedavisi önem arz etmektedir. Özellikle derin yanıklarda debridman ve greftlemeden kaçınılmamalıdır.

Anahtar Kelimeler: Yanık, karsinom

Aurelius C. Celsus, a first century Roman physician is credited with the first written account of cancer arising in an old burn

scar.¹ Marjolin was the first reporting malignant changes on the chronic wounds in 1827. Since his report, squamous cell carcinoma arising in chronic wounds such as burn scars has been named Marjolin's Ulcer.

Most Marjolin ulcers arise in full-thickness burn sites that remain ungrafted or where grafts have failed. These grafts often develop chronic and recurrent ulcerations before undergoing malignant transformation. The tumor starts at the ulcer mar-

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Table 1. Ages at the time of burn injury and at the diagnosis as well as anatomic locations are presented along with surgical methods chosen.

Patients	Age	Age A.B.T.	Location	Surgery	LND
1.	53	43	Scalp	Exc-STSG	-
2.	62	5	L. Thigh	Exc.-STSG	+
3.	73	4	L. Wrist	Exc.-STSG	-
4.	38	5	R. Thigh	Exc.-FTSG	-
5.	48	3	R. Thigh	Exc.-STSG	-
6.	54	4	L. Wrist	Exc.-STSG	-
7.	44	4	L. Thigh	Exc.-STSG	+
8.	52	38	Post. Trunk	Exc.-L. Dorsi	-
9.	51	19	R. Thigh	Exc.-STSG	-
10.	42	7	Post. Trunk	Exc.-STSG	-
11.	58	9	R. Foot	Exc.-STSG Amputation	-
12.	64	15	R. Knee	Exc.-STSG	-
13.	47	11	R. Buttock	Exc.-STSG	-
14.	49	6	R. Hand	Exc.-STSG	-
15.	54	9	Scalp	Exc.-Flap	-
16.	48	5	R. Foot	Exc.-STSG	-
17.	57	10	R. Axilla	Exc.-STSG	-
18.	72	6	Scalp	Exc.-Flap	-
19.	46	6	R. Leg	Exc.-STSG	+
20.	52	9	R. Thigh	Exc.-STSG	-
21.	66	8	R. Arm	Exc.-STSG	-
22.	70	11	L. Hand	Exc.-STSG	-
23.	61	4	R. Knee	Exc.-STSG	+
24.	65	14	L. Foot	Exc.-STSG	+
25.	44	16	R. Wrist	Exc.-STSG	-
26.	39	7	R. Buttock	Exc.-STSG	-
27.	57	11	L. Arm	Exc.-STSG	-
28.	62	14	R. Arm	Exc.-STSG	-

Age ABT: Age at the time of burn injury, LND: Lymph node dissection, Exc: Excision, R: Right, L: Left, Post: Posterior, STSG: Split thickness skin graft, FTSG: Full thickness skin graft.

gin and grows slowly. Only a portion of the ulcer becomes malignant, thus false negative reports on biopsy are not uncommon. Localized pain can accompany malignant transformation.²

In this paper, we present a group of 28 cases of squamous cell carcinoma arising in old burn scars where no treatment such as debridement or grafting took place.

Material and Methods

From February 1993 to February 2004, a total of 28 patients presenting to the clinics with the complaints of non-healing wounds on the previously occurred burn areas and subsequently diagnosed to have Marjolin ulcer (squamous cell carcinoma) were assessed in a retrospective analysis

(Table 1). There were twelve female and 16 male patients in this series. The age of patients at the time of diagnosis varied from 38 to 73. The mean age was 54.5 years. The follow up period varied from 3 to 11 years. The lesions were located mostly in lower extremities (Figures 1, 2, 3).

The etiology was a burn injury (flame and scald) in all of the cases with the burned area less than 15% of total body surface area and localized to circumscribed areas of the body.

Results

Upon history taking, it was noted that all patients had only medical treatment with oral antibiotics and topical antibiotics for the burn injuries. None of these patients had debridement or grafting



Figures 1, 2, 3. Some of the patients with the Marjolin's ulcers are depicted.

procedures. The average time period from the time of injury to the occurrence of malignancy was 43.3 years, the shortest being 10 and the longest 69 years. All of the patients had histopathologic di-

agnosis of squamous cell carcinoma of skin before they underwent surgery. Preoperative CT scanning was performed to determine the extent of the lesions. All patients had excision of the tumor mass with a safety margin of at least 2 cm. Two cases with Marjolin's ulcer on the scalp and one patient with thoracic wall involvement had a reconstruction with flaps. The rest of the patients had reconstruction with split thickness skin grafts. The patient with the involvement of posterior bony chest wall had latissimus dorsi myocutaneous flap for reconstruction. Four cases had lysis of grafts due to infection in the recipient area and was subsequently regrafted after eradication of the infection. One patient with Marjolin's ulcer in the right lower extremity had recurrence and underwent below the knee amputation. Postoperative recovery was uneventful in the rest of the cases. They were discharged in healthy status and were followed up in the clinics on a periodic basis.

Only five patients underwent lymph node dissection for they had clinically palpable lymph nodes on presentation of their symptoms. Those patients with lymph node dissection had no histologically confirmed metastasis to the lymph nodes.

Three cases with tumors on the scalp were lost due to recurrence and cerebral invasion. There was no recurrence or metastasis in this follow-up period in the rest of the cases.

Discussion

Malignancies arising in chronic scars, sinuses, venous ulcers are simply referred to as Marjolin Ulcers. Squamous cell carcinoma is by far the most common malignancy to arise from burn scars, although basal cell carcinoma, melanoma and sarcoma have also been reported.³⁻⁵

Risk factors for cutaneous squamous cell carcinoma include long-term exposure to ultraviolet or ionizing radiation or arsenic and repeated contact with polycyclic hydrocarbons. They can also appear on chronic lesions caused by burns, ulcers, or infection of traumatic wounds.¹ The mechanism of malignancy occurrence is theorized to be a sequence of repeated ulceration and healing in the

ulcers and repeated trauma in scars. There are also some classic theories speculating that a carcinogenic toxin produced from the burned tissue or the cicatricial tissue preventing the immunological mechanisms from checking the new tumor formation may be the cause of tumor development.⁶⁻⁹ Slow initial healing and scar instability result in recurrent ulceration and, in the end, neoplastic changes.¹⁰ It has also been suggested that depressed cellular immunity could play a role in carcinoma development in scars.¹¹ To exclude a primary cancer as the cause of an ulcer there must be a minimum of duration of the lesion, which Tenopyr and Silverman propose to be three years.¹² Approximately 2% of burn scars undergo malignant transformation over time.⁶

Burn scar carcinoma has a propensity for the extremities, specifically to flexion creases of the extremities, where blood supply is decreased and trauma is increased.¹³ The average period from a trauma history and subsequent development of a Marjolin's Ulcer is 32.5 years and the latency period is inversely proportional to the age of the patient at the time of injury.¹⁴ However, there are some reports of Marjolin's Ulcer arising as short as 18 months to 3 years.^{15,16}

In contrast to most other tumors of squamous cell carcinoma the Marjolin's Ulcer has an aggressive natural course and has a poor survival rate. The 2-year survival rate varies from 66% to 80%. Their metastatic rate, as compared to that of Marjolin ulcers arising in burn scars, is significantly higher at 61% versus 34%. The usual time to appearance of squamous cell carcinoma in a chronic wound other than chronic burn wounds is 25 years as compared to more than 30 years in burn related carcinoma, but it can be as short as 3 years.¹⁷ Although latencies of over 50 years have been reported for chronic burn scar carcinoma, the average time is approximately 35 years.^{10,18} High metastatic (more than 30%) and highly aggressive recurrences are reported in Marjolin's Ulcer, with overall 5-year survival rates of less than 10%.^{19,20} Whether this is due to late detection or to aggressive tumor behaviour is unclear.^{9,21} It has been reported that the majority of burn scar carcinomas

occur in burns that has not been grafted following injury.^{10,22}

Treatment involves complete excision of tumor with a good control of margins. Mohs micrographic technique has been suggested as an alternative to amputation, although data regarding long-term recurrences are not available.²³

Regional lymph node dissection should be performed when there is a palpable lymph adenopathy. Elective lymph node dissection for prophylactic purposes might be a good option in view of the overall poor prognosis.^{17,24-26} This issue still remains to be controversial. Lifeso and Bull advocate that lymph node dissections be performed according to their histological type and grade.²⁷

In this group of 28 patients, the natural progress noted from the history of the patients was similar to what had been reported earlier. However, due to the fact that patients come from indigenous portion of the society, they seemed to present very late after the occurrence of the carcinoma. Nevertheless, most of these patients had no lymph nodes palpable. In their follow-up up to eleven years, in most of the cases there was no metastasis or recurrence despite of the lack of routine prophylactic lymph node dissection performed. The issue of lymph dissection is one of the controversial areas. However, it is a common practice that regional lymph node is performed when one has clinically palpable lymph node is present.^{16,28} Due to potential morbidity associated with it, we also opted for lymph dissection only for those cases with palpable lymph nodes.

In contrast to the reports in the relevant literature, we have not seen low survival rates in our patients. Surgeons should not hesitate to be aggressive in their approach particularly when these patients present late.

Early diagnosis requires a high index of suspicion. Primary care physicians as well as the patient should always be aware of the possibility of a malignancy especially when the scars break down and show ulcerations. A biopsy needs to be performed accordingly. Considering the fact that there is always a high possibility of false negativity on the biopsies, one should be perseverant and vigilant.

Prolonged healing of severe burns is reported to have a high potential for malignancy development. Therefore, skin grafting may have an effect on the prevention of malignancy in the burn wounds.^{28,29}

We recommend that an aggressive protocol and close follow-up be observed for the excision of these tumors. The family of the patients as well as the patient should be aware of the potential of the malignancy in the burned areas of the body. The physicians dealing with the primary treatment of the burns need to train patients and the relatives for the potential development of malignancy. Also as physicians we should be aware of the possibility of malignancy in the burn scars. We also believe that the burn surgeons should be cognizant of the fact that deep burns need to be debrided surgically and grafted than left to secondary healing.

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