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CASE REPORT

Malignant change after 18 months in a lower limb ulcer: acute Marjolin's revisited

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Summary Lower limb ulcers present a common clinical problem and are at risk of malignant change. A Marjolin's ulcer has traditionally been regarded as malignant change in a long standing ulcer and/or scar tissue.

We report a case of Marjolin's degeneration that developed in an ulcer only 18 months following the initial injury. Such a short latent period has not been reported for over 70 years. This report highlights the possibility of early Marjolin's change and we propose a ranked diagnostic screen to aid in early identification of possible malignant change, based on the current published evidence.

Case report

A 75-year-old male was referred to the department of plastic surgery with a chronic ulcer on the medial aspect of his right calf of 18 months duration. A previous history of deep femoral vein thrombosis of the limb, complicated by a compartment syndrome of the leg, had resulted in skin loss over the medial calf. Medial and lateral fasciotomies were undertaken, with debridement of necrotic skin on the medial calf. The size of the initial wound was 15 × 10 cm. The referring surgeons had managed it with dressings alone owing to the patient's poor anaesthetic risk status. Initially, the wound made progress with epithelialisation and contraction of the wound margins to 7 × 1 cm by 9 months (Fig. 1).

At 18 months, the wound suddenly increased by 4 cm in diameter to 7 × 5 cm (Fig. 2) and clinical suspicion led the dermatologists to perform an incisional biopsy. Histology reported a squamous cell carcinoma (SCC) and the case was referred to the department of plastic surgery for wide local excision and skin grafting. The patient made an uneventful recovery. Further histology of the whole lesion revealed a well-differentiated SCC of 6 mm depth with satisfactory clearance.

Discussion

Marjolin's ulcer is the term given to skin cancers that originate in areas of chronic injury or irritation.[1–17] It is not common and consequently can easily be missed.[1] It is said to have a worse prognosis than de novo SCC due to its high rate of metastasis.[1] Delayed diagnosis may result in the

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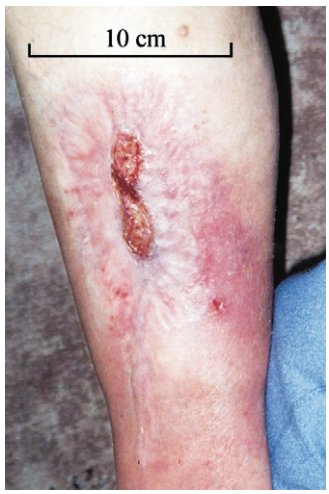

Fig. 1 Wound at 9 months.

need for more extensive surgery or increase the risk of metastatic spread.

Celsus first noted, as early as the first century, the association between thermal burn scars and malignant degeneration.[2] Later, a French surgeon, Jean-Nicolas Marjolin (University of Paris), described the occurrence of ulcerating lesions within scar tissue in 1828. He termed them 'cancroidal' but believed them to be of a non-malignant nature.[3] In fact, it was Dupuytren who first observed that de novo malignancy could arise in chronic wounds. In 1839, he observed this phenomenon in a Belgian man who was treated for a cancer which arose from a burn scar sustained from sulphuric acid.[2,3]

We undertook a review of the literature using Medline (2003). The search encompassed the entire database. The main keywords used were 'Marjolin's ulcer', 'chronic wound', 'cicatrix' and 'squamous cell carcinoma'. Marjolin's ulcers are reported to

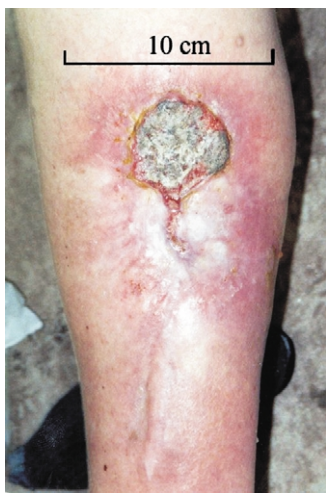

Fig. 2 Wound at 18 months.

arise most commonly in burn scars.[2] They are also known to occur in other circumstances where chronic inflammation is a feature, such as urinary fistulae,[4] chronic sinuses due to osteomyelitis,[5] venous ulcers,[6] pressure ulcers[7] and hidradenitis suppuritiva.[8] Fleming et al.[9] state that over 90% of Marjolin's ulcers degenerate into malignancies of epidermoid origin, such as SCCs, basal cell carcinomas and malignant melanomas. Sarcomas can occur but are uncommon. Precise estimates of the true risk of malignant degeneration in a chronic wound or scar are difficult to obtain, as the data are predominantly derived from retrospective case studies. In 1993, a Swedish prospective cancer database[6] revealed a relative risk of developing SCC in long standing venous ulcers as high as 8.2 times the risk of developing de novo SCC on the lower limb.

The latent period between original injury and the development of Marjolin's ulcer has been documented as being as long as 30 years.[1] Lawrence hypothesised (1952) about the latent period for Marjolin degeneration and postulated that a patient's age at the time of the burn is inversely proportional to the interval to formation of cancer.[10] Earlier, Treaves and Pack[2] (1930) attempted to classify Marjolin's ulcers into two subgroups. There were those scars that underwent neoplastic conversion less than a year after the initial injury and those that degenerated after one year. They went on to review 28 burns cases over a period of 12 years. Six cases of acute (latent period less than one year) malignant change were reported, with an average latency of 0.3 years. This is the shortest duration of malignant degeneration in a Marjolin's ulcer that we have encountered on review of the contemporary literature. Although this paper is frequently quoted in subsequent literature,[1,3,5,7,11,14,16,17] we found no other report to date that demonstrates such an early malignant change in a chronic wound.

The pathogenesis of Marjolin's ulcer remains unclear and controversial. Early theories suggested that cellular mutations as a result of toxin release by damaged, ischaemic and nutritionally deficient tissues are responsible for neoplastic change.[2] Neuman et al.[11] proposed that traumatic displacement of living epithelial tissues into the dermis may cause a foreign body response and lead to a deranged regenerative process, resulting in carcinomatous change. More recently, a theory of immunologic isolation has been suggested, whereby lymphatic channel obliteration at the site of injury decreases the delivery of antigen or specifically stimulated small lymphocytes to the regional lymph nodes from that site. This renders the site 'immu-

Table 1 Ranked diagnostic features of Marjolin's ulcers derived from 72 case reports. Fifteen descriptive categories were used and 180 results

Points in the history	Number of case reports
Sudden crusting of scar/sudden unexplained ulceration	29
Sudden increase in pain	18
Sudden increase in ulcer size	13
Bleeding	12
Unexpected delay to healing of small wound	10
Increasing exudate/discharge	10
Intermittent healing and breakdown over long period/failure to heal of >2 years	7
Painless	1
Clinical appearance	
Edge—everted/elevated/thick/hard/rolled/pearly	26
Ulcer—infected/fungating/foul smelling/indurated/inflamed	24
Increasing mass/nodule	12
Granulation tissue—overgrowth/abnormal appearance	9
Irregular edge	6
Multiple ulceration	2
Regular edge	1

nologically privileged', allowing the development and progression of antigenically foreign tumour cells to go unchecked. Such cells may initially arise by spontaneous mutation or develop under the influence of viral or chemical carcinogens. Tumour antigen recognition may then be delayed long enough for tumours to reach 'critical size', when immune mechanisms are no longer sufficient to prevent continued neoplastic progression.[12–14] It has also been suggested that patients with inherent immune deficiency are at higher risk of such ulcers.[15] A 'double insult' or carcinogen concept has also been put forward. It suggests that the burn or injury, while not in itself carcinogenic, may cause the wound tissue to be more susceptible to other carcinogens such as ultraviolet light or radiation.[1]

Gross morphological features of SCC have been described as being of two main types—more commonly, lesions can appear as shallow ulcers with well-defined margins and a nodular surface with tumour along the periphery; or may present as exophytic proliferative tumours with papillary granulations. Tumours can be secondarily infected and metastases can occur with either type of lesion. Secondary infection may obscure the clinical significance of associated lymphadenopathy.[9]

In order to aid in the clinical diagnosis of Marjolin's we looked at 72 case reports[1–11,16,17] in which a detailed description of the history and appearance of Marjolin's ulcer was made. We identified 29 commonly used descriptive terms. To facilitate simplicity of use, 15 descriptive categories were defined which we believe is useful in the identification of acute Marjolin's degeneration (Table 1).

Conclusion

Chronic ulcers may increase the risk of developing SCC by eightfold.[6] Marjolin's ulcer is a potentially aggressive malignant tumour, which has a typically long latency period. Acute Marjolin's ulcer (latent period less than one year) is uncommon. We believe this case report highlights the possibility of malignancy arising in a patient with a non-healing wound, even with a short history. To aid diagnosis we suggest that sudden crusting or unexplained ulceration of scar tissue, a sudden increase in pain and/or size of leg ulcer and bleeding may be useful points to bear in mind.

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