Case Report and Review of the Literature

Burn scar squamous cell carcinoma of both hands

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Abstract

Background: We describe a very unusual presentation of bilateral post-burn contracture of hands that complicated into Marjolin's ulcers - squamous cell carcinoma.
Material: A patient with bilateral squamous cell carcinoma post-burn scar.
Method: The patient, with post-burn contractures of both hands, and chronic ulcerations, presented as a referral from one of our peripheral hospitals. A biopsy had been done at the referring hospital with histologic results of squamous cell carcinoma. The patient later had an excisional biopsy in our hospital that confirmed the diagnosis of squamous cell carcinoma of both hands. The patient also had a satellite lesion on the axilla; a biopsy was done that confirmed squamous cell carcinoma.
Results: The right hand was treated with a free flap that later sloughed on the periphery.
Conclusion: To our knowledge bilateral squamous cell carcinoma of hands post-burn has not yet been reported in the literature and its presentation is a matter of discussion.

Key words: post-burn, scar, Marjolin's ulcers, squamous cell carcinoma

Introduction

We describe a case of bilateral post-burn squamous cell carcinoma of the hands. The patient presented with Marjolin's ulcers on both hands (*Figure 1*). Marjolin's ulcers are used to describe malignant tumours arising in many different types of cutaneous scars and chronic wounds.

The patient was a known HIV-positive patient who defaulted on her antiretroviral treatment

On 30 November 2009 a 31-year-old female patient from one of our peripheral hospitals presented with fungating septic and painful ulcers on the dorsal aspects of both hands. She also had a history of burns on both hands on the sites of the Marjolin's ulcers which had occurred 13 years ago. The patient was a known HIV-positive patient who defaulted on her antiretroviral treatment. She also presented with an abscess and lymphadenopathy of the left axilla and other abscesses on proximal parts of the left arm (*Figure 2*). A biopsy had been done on both hands at the peripheral hospital with histological results of squamous cell carcinoma of both hands. Incision and drainage of the left axilla abscess had also been done at the peripheral hospital. Clinically both hands had septic ulcers on the dorsal aspect with septic elevate margin.

Bone scan:
The patient refused to go for a bone scan.

Bloods:
FBC: ↓Hb; ↑neutrophils: ↑ ESR: Absolute CD4 count 348.

Radiographs:
Radiographs showed osteopaenic and arthritic changes of wrists and hands (*Figures 3–7*). Chest radiographs did not show any metastasis (*Figure 8*).

The patient was optimised for theatre and excisional biopsy of both hands was done. Histological results confirmed squamous cell carcinoma with clear margins. Later she was taken for a free flap on the right hand (*Figures 9 and 10*).

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

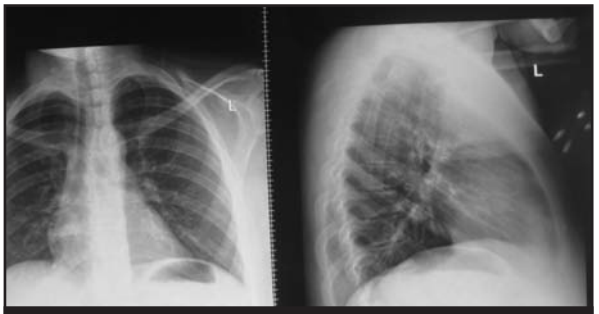

Figure 8

Figure 9

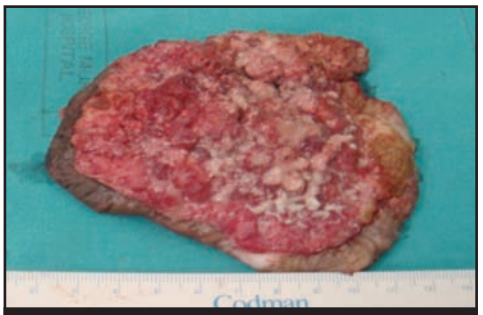

Figure 10

D17 post-free flap, the graft started sloughing at the periphery. Haemoglobin was going down and the patient refused blood transfusion. The patient deteriorated while the plan was to send her for radiotherapy; 2 months later she demised.

Discussion

Incidence

Squamous cell carcinoma is the most common malignant tumour of the hand,[1] and accounts for 16% of all skin malignancies. Burn scar carcinoma accounts for 2% of squamous cell tumours.[2] The tumours can occur in the extremities, head and trunk.[3] This patient was young, injured 13 years ago and the pathology occurred in both upper extremities.[3]

Aetiology

The risk factors include ultraviolet radiation exposure to sun, immunocompromise, irradiated skin, human papillomavirus, infection, chemical exposures and certain genetic diseases such as xeroderma pigmentosum.[1,4,5] The patient was immunocompromised and there was also history of exposure to the sun.[6]

Pathogenesis

The cause of the tumour may arise from cutaneous scars or chronic wounds; the nature of the scar may also lead to malignant degeneration.[7,8] Other theories include decreased vascularities and weakened epithelium.[9] But even areas that have been successfully grafted have turned malignant later. This may be related to the damage of underlying connective tissue. Some malignant changes may be related to the nature of the scars that are more likely to ulcerate and develop malignant degeneration.[10]

Decreased vascularity and a weakened epithelium are unable to withstand the effect of carcinogens and are therefore predisposed to malignant transformation.[9]

Some malignant changes may be related to the nature of the scars that are more likely to ulcerate and develop malignant degeneration

Pathological types

Squamous cell carcinoma is the most common histologic types post-burn with the second-most common cancer being basal cell carcinoma.[2,9] Other tumours arising from burn scars include basal cell, melanoma, osteogenic sarcoma, fibrosarcoma, adenosarcoma and liposarcoma.[8,9,11,12]

Clinical presentation and diagnosis

These tumours affect persons of any age and have no predilection for race.[13] They are common in adult males and affect extremities on the flexion creases.

Symptoms include increase in pain, mass formation in the scar, foul smell and bleeding. It is important in differential diagnoses to exclude chronic osteomyelitis.[14]

The investigation includes X-rays, and MRI and bone scan are necessary. Ordinary X-rays are normal in the early stages of the disease.[15,16]

To confirm the diagnosis, a biopsy is mandatory.

Regional lymph node metastases are the most frequent site. Other areas include the brain, liver, lung, kidneys and distant lymph nodes.

Prevention and treatment

There are several ways of preventing these tumours; options include preventing accident burns; avoiding the use of radiotherapy, skin graft or flap; and avoiding scarring and contractures.

The treatment of choice is surgical excision with or without grafting or flap. For those patients unfit for any surgical procedure, the recommended treatment is radiation therapy.

Regional lymph node dissection is controversial.[17] Radiation therapy has been used for lesions that are not suitable for excision or for patients who refuse surgical excision.[18]

Conclusion

Squamous cell carcinoma affecting both hands is rare and the outcome of treatment in a patient who is also immunocompromised is difficult to predict. Despite the poor results we may reach a different outcome with better response to treatment if the patient presents early.

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References

1. Joyner KS, Wilson B, Wagner RF, Viegas SF. Marginal excision of squamous cell carcinoma of the hand. *Orthopaedics* 2008 January.
2. Erf-fan X, Ao L, Shi-liang W, Shao-yu K, Guang-Xiu C. Burn scar carcinoma: A case report and review of the literature. *Annals of the MBC* 1992 June;5(2).
3. Castanares MS. Malignant degeneration in burn scar. *California Medicine*1961 March;92(3):175-77.
4. Scholtens REM, Zuuren HEJ, Posma AN. The treatment of recurrent squamous cell carcinoma of the hand in immunosuppressed patients. *J of Hand Surgery* 1995 January;20(1):73-75.
5. Glover DM, Kiehn, CL. Marjolin's ulcer: Preventable threat to function and life. *AM J of Surg* 1949;78:72-78.
6. Castilo J, Goldsmith HS. Burn scar carcinoma. *Cancer J of Clin* 1968;18:140-42.
7. Novick M, Card, DA, Hardy SB, Spira M. Burn scar carcinoma: A review and analysis of 46 cases. *J of Trauma* 1977;17:809-17.
8. Horton CE, Crawfort HH, Love, HG, Leffler RA. The malignant potential of burn scar. *Plastic Reconstruction Surgery* 1958;22:348-53.
9. Treves N, Pack GT. The development of cancer in burn scars. *Surg of Gynae and Obstet* 1930;51:749-82.
10. Aarons, MS, Lynch, JB, Lewis, SR. Scar tissue carcinoma. A clinical study with special references to burn scar carcinoma. *Ann Surg* 1965;161:170-88.
11. Lawrance REA. Carcinoma arising in burn scars. *Surg Gynae Obstet* 1952;95:579-88.
12. Drut R, Barletta L. Osteogenic sarcoma arising in an old burn scar. *J of Cutan. Pathol* 1975;2:302-306.
13. Barr LH, Menard JW. Marjolin ulcers. The LSU experience. *Cancer* 1983;52:173-75.
14. Rauh MA, Duquin TR, McGrath BE, Mindell ER. Spread of squamous cell carcinoma from the thumb to the small finger via the flexor tendon sheath. *J of Hand Surg* 2009;34A:1709-13.
15. Johnson LL, Kempson RL. Epidermoid carcinoma in chronic osteomyelitis: Diagnostic problems and management. *J of Bone and Joint Surg* 1965;47(A):133-45.
16. Gong HS, Cho JH, Roh YH, Chung MS, Baek GH. Bone invasion by squamous cell carcinoma in situ of the finger during treatment with imiquimod 5% cream. Case report. J Hand Surg Am 2010;35:999-1002.
17. Bostwick J, Prendergast WJ, Vasconez LO. Marjolin ulcers – an immunological privileged tumour. *Plast Reconstr Surg* 1976;57:66-69.
18. Ames FC, Hickey RC. Squamous cell carcinoma of the skin of the extremities. *Int Adv Surg Oncol* 1980;3:179-99.