

A case of left hand back burn scar complicated with squamous cell carcinoma

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Abstract: A case of a burn scar on the back of the left hand complicated by squamous cell carcinoma admitted to our hospital is presented. [Methods] The patient was treated with an enlarged excision of the tumour tissue and a right anterolateral femoral flap graft. [Results] The patient's wound healed well without infection, oozing or dehiscence. At six months follow-up, there was no local recurrence or distant metastasis of scar carcinoma. [Conclusion] Scar carcinoma is mostly a chronic refractory ulcer that is easily overlooked by clinicians, so early detection, early diagnosis and early surgery are needed.

Keywords: Burn scar cancer, Squamous cell carcinoma, Malignant ulcer, Case report; Prevention

1. Introduction

Burn scar cancer/carcinoma (BSC) is a malignant tumour of the epithelial tissue that develops when the healing scar is irritated by various factors over a long period of time. Squamous cell carcinoma is the most common type of scar cancer, followed by basal cell carcinoma. The characteristics and treatment of burn scar carcinoma, especially the method of repairing the wound after tumour excision, are still worthy of further discussion. In view of this, I would like to discuss the diagnosis and treatment of a case of burn scar on the back of the left hand complicated by squamous cell carcinoma, which was admitted to our hospital.

2. Clinical data

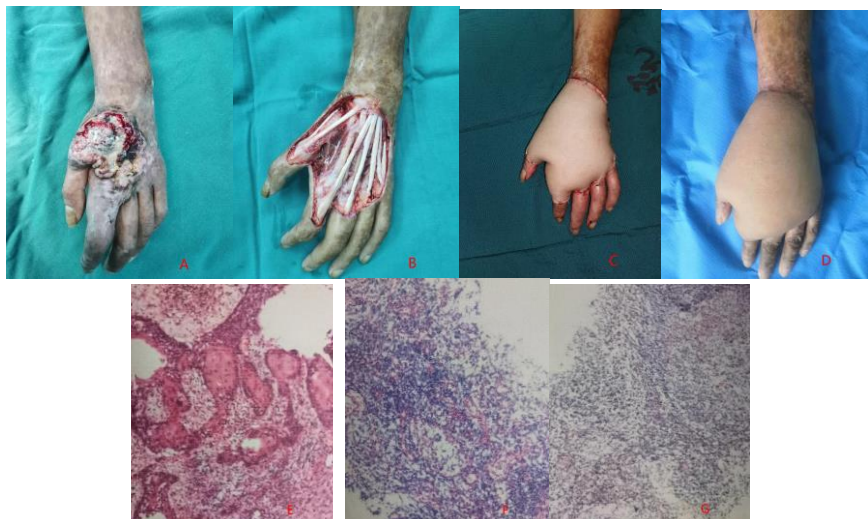


Figure 1 A: Pictures of the left hand after carcinoma; Figure B: Left dorsal hand after enlarged debridement; Figure C: Left dorsal hand after flap grafting of defective tissue; Figure D: Left hand six months after surgery; Figure E: Pathological image of highly differentiated squamous cell carcinoma of the left dorsal hand tissue (HE, $\times 100$), suggestive of squamous cell carcinoma; Figure F: Pathological image of lymph node reactive hyperplasia in the left axillary lymph node (HE, $\times 40$); G: Pathological image of axillary lymph node re-examination six months after surgery (HE, $\times 40$).

History: Patient Li, male, 44 years old, a cook, was admitted to the hospital with the chief complaint of "left hand burn for 20 years, repeatedly broken for 2 years, aggravated for more than 2 months". Two years ago, the scar on the back of his left hand was frostbitten and cracked, oozing a yellowish fluid, which was treated by self-medication, but did not heal for a long time. On examination: the skin on the back of the left hand was ulcerated and a wound of approximately 6 x 6 cm in size was visible. The ulcerated surface was raised and turned out in a cauliflower shape, irregular in size and shape, and uneven in height. PET/CT showed 1) squamous carcinoma of the left hand and 2) enlarged lymph nodes in the left axilla; the lesion on the back of the left hand showed: microscopically, the skin tumour tissue was arranged in a nested pattern, with infiltrative growth, large, deep-stained and heterogeneous nuclei. See Figure F. Laboratory tests: blood, urine, stool and liver and renal function were not abnormal. Diagnosis: squamous cell carcinoma (T3N0M0) of the left dorsum of the hand. Follow-up: ultrasound of the left dorsal hand six months after surgery: mild subcutaneous oedema of the left dorsal hand, no abnormal tissue detected; axillary lymph node examination: reactive lymph node hyperplasia was considered.

3. Discussion

Scar cancer is a pathological skin injury caused by various reasons such as burns, scalds, chemical burns, physical trauma, etc. Skin wounds mostly heal in the form of scars, which later ulcerate and erode under the repeated stimulation of external factors and may be accompanied by malodor, and the ulcers become cancerous after a long period of time, among which squamous cell carcinoma is common, followed by basal cell carcinoma^[1]. Scar carcinoma is more common in men than in women, with a male to female ratio of approximately 3:1-4:1, which may be related to occupational factors^[2], as men are more likely to be involved in high-risk occupations than women in society, which determines a higher probability of limb injury in men. Scar carcinoma occurring after scald (burn) injury is a malignant transformation of skin scar tissue formed after scald injury, which is a rare malignancy and can occur in 0.5%-2% of patients after skin burn injury^[3].

The incubation period of skin scar cancer is often clinically divided into acute and chronic lesions according to the latency cycle of skin scar cancer, and chronic lesions are more common, and the onset of cancer in scar tissue is slower, with an average latency period of 35 years; malignant lesions occurring within 1 year after the original lesion are mostly acute lesions, which are not common clinically. The younger the age of the scar, the longer the latency of the cancer^[4]. Deep second- and third-degree burns or ulcerated surfaces with delayed healing can malign and form scar cancer. Scar carcinoma can occur throughout the skin, with the extremities and scalp being the most common. 412 patients with burn scar carcinoma were analyzed by Kowal-Vern and Criswell^[5], of which squamous cell carcinoma accounted for 71%, basal cell carcinoma for 12%, melanoma for 6%, melanoma for 6%, sarcoma for 5%, and other tumors for 6%. The patient in this case was a deep second-degree burn on the back of the left hand 20 years ago, and the cancer occurred 2 years ago under the stimulation of various factors, which is basically consistent with the occurrence pattern of scar carcinoma.

The etiology and pathogenesis of scar carcinoma are still unclear, and its pathogenesis may be related to a variety of factors such as structural and functional alterations of skin tissues, internal and external environmental influences, immunodeficiency, and genetics. Modern studies have found^[6] that the possible molecular mechanisms of scar cancer include: (i) abnormal p53 gene; (ii) mutation of Fas gene; (iii) abnormal upregulation of metastatic growth factor- β (TGF- β)/Smad signaling; and (iv) activation of PI3K/AKT signaling pathway and inhibition of apoptosis.

At present, the common clinical scar cancer can be divided into two types: infiltrative type: the clinical manifestation is hard ulcer tissue, can smell foul odor, superficial margin, uneven bottom, crater-like ulcer margin, with better prognosis; papillary type: the manifestation is ulcer bleeding easily when touched, foul odor, irregular depth, outwardly elevated margin, cauliflower-like, often with enlarged lymph nodes, with worse prognosis^[7]. The gold standard for its diagnosis is histopathological examination of cancerous lesions. The patient in this case was an invasive scar carcinoma, and the diagnosis was confirmed by preoperative pathology, and PET/CT was performed to clarify that there was no distant metastasis, and the patient had a strong desire for limb preservation, so extended resection of tumor tissue and flap transplantation was performed.

Currently, the preferred treatment for scar carcinoma is surgical enlargement of the diseased tissue and autologous skin slice grafting after resection, and flap coverage is feasible for more soft tissue defects. The recurrence rate of tumor is higher when the surgical margin is 1-2 cm from the tumor, so 3-5 cm from the tumor margin is considered to be a safer range^[8]. The surgical resection depth is

determined by the depth of tumor infiltration and generally requires resection to the lower normal tissues of the tumor infiltration level. Related studies have found ^[9] that a free anterolateral femoral penetrating flap or latissimus dorsi flap is ideal for repair, allowing for larger skin and soft tissue, and the donor area can be directly sutured without affecting function. In this case, the patient excluded distant metastases preoperatively, and the patient himself had a strong desire for limb preservation, so he was treated with expanded resection of cancerous tissue, intraoperative frozen biopsy, traumatic antibiotic bone cement absences, and right anterolateral femoral flap repair. During the operation, the principle of surgical asepsis was fully followed, and the resection margin was 3 cm from the tumor margin to the lower layer of the tumor, and the intraoperative tissue was taken at multiple points for intraoperative pathological examination until the freezing results showed that the resection margin and the base were negative (see Figure B). To ensure complete resection of the tumor tissue, antibiotic bone cement was used to cover the trauma locally after the first operation, and the operation was repeated 2 weeks later with intraoperative pathological examination of tissue taken at multiple points to determine the absence of tumor tissue, and then the right anterolateral femoral flap was used to cover the trauma according to the size of the lesion defect (see Figure C). The dorsal dorsal left hand was reviewed 6 months after surgery with subcutaneous ultrasound suggesting no tumor recurrence and the appearance of the dorsal left hand (see Figure D) and axillary lymph node pathology (see Figure G).

The recurrence rate of burn scar carcinoma is high, and 6% to 53% of scar carcinomas mostly recur within 1 year after surgery, with a poor prognosis. The pathological type of scar cancer and whether the lymph nodes metastasize distantly are closely related to postoperative recurrence, and those with low differentiation and preoperative lymph node metastasis have a high recurrence rate ^[10]. The pathological process of carcinoma of burn scar is slow and should be prevented, except for scar contracture and proliferative, malignant transformation is one of the sequelae of scar ^[11]. In this case, the patient was engaged in the chef industry in the early stage and did not pay attention to the leftover skin scar after the burn injury was treated in a timely manner, which later led to the long-term ulceration of scar tissue under various stimuli to develop cancerous lesions.

In conclusion, scar carcinoma is mostly a chronic refractory ulcer, which is easily ignored by clinicians, so early detection, early diagnosis and early surgery are needed. The author reports this case of burn scar complicated by squamous cell carcinoma, which on one hand can improve clinicians' understanding of scar cancer and reduce the underdiagnosis, recurrence and death rate of scar cancer. On the other hand, it provides the public with medical knowledge related to scar, scar ulcer, and scar carcinoma to improve public awareness of the disease and effectively prevent the occurrence of scar carcinoma ^[12]. In addition, clinicians should strengthen the regular follow-up of patients after surgery to prevent.

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