



Case report

A safe and effective treatment: Surgery combined with photodynamic therapy for multiple basal cell carcinomas

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1. Introduction

Basal cell carcinoma (BCC) is the most common skin malignancy that is associated with sun exposure and often occurs in the face and neck. It tends to erode locally and rarely metastasizes [1]. Common treatments for solitary BCC include surgery, photodynamic therapy (PDT), cryotherapy, radiotherapy, and topical use of imiquimod and 5-fluorouracil (5-FU). Treatment for multiple BCCs remains challenging. Surgical excision is preferred for multiple BCCs, but according to previous pathological results, the margin needs to be expanded by 4 mm, or Mohs micrographic surgery is necessary. Surgery can achieve the highest tumour clearance; however, a large and often multiple surgical wound are usually formed, and the use of a local skin flap or free skin grafting may be required [2]. The advantages of PDT for multiple BCCs are that it has an excellent cosmetic effect compared to surgery, and it is commonly used in primary superficial BCC and thin low-risk nodular BCC; it is recommended that PDT be used to scrape the surface and then to perform more than two treatment cycles [3]. The long-term efficacy of PDT requires further follow-up and evaluation.

To achieve the desired therapeutic effect, a combination therapy method can also be used. Here, we report an economical, effective and safe method for the treatment of multiple BCCs in the neck and face: surgery combined with two PDT cycles, which not only completes the resection of the lesion but also maximizes the preservation of normal skin.

2. Case report

A 63-year-old male patient was admitted to our hospital with a history of black masses on the face and anterior side of the neck for 7

years and a new mass on the left side of the neck for 11 months. Physical examination showed a mass on the right side of the face near the eye and four masses on the anterior side of the neck. All masses were brownish black in colour with a rough surface but no ulceration, and the largest mass was approximately 2 cm*1.5 cm in size. In addition, there was a black plaque on the left side of the neck, in which the surface was ulcerated and the size was approximately 4.5 cm*3 cm. Pathological biopsies of the facial and anterior neck masses both showed nodular basal cell carcinoma, and tumour cells had invaded into the deep dermal layer.

After discussion by the Xiangya skin tumour MDT team, this patient was confirmed to be an elderly male with multiple BCCs; in addition, the tumour area was large, and one tumour was close to the eye. According to the NCC guidelines [2], we considered this patient to have multiple high-risk BCCs. If Mohs or expansion surgery were to be used, the operation would be difficult and traumatic, the cost would be high, and the operation time would be long. Therefore, we considered surgery combined with PDT treatment. After excluding the surgical contraindications and obtaining the patient's informed consent, we delineated the surgical boundary through the use of a dermatoscope and then performed in situ resection. The depth of the incision reached the deep fascial layer to ensure that the base was clean and then simply sutured. Immediately, 20% 5-aminolaevulinic acid (5-ALA) cream was applied to the incision, and after 4 h of light-free incubation, irradiation was carried out for 20 min using 100 J / cm² 633 nm red light at 80 mW / cm². After seven days, the second cycle of photodynamic therapy was performed, and the patient's wound healed well.

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Fig. 1. (a–d): Clinical pictures before the treatment. A mass near the right eye and 4 masses on the front of the neck, the largest of which was approximately 2*1.5 cm with no ulceration on the surface. In addition, a brown and black plaque on the left side of the neck, approximately 4*3 cm, can be observed with ulceration on the surface. (e–f): Clinical pictures after 2 years of follow-up. A few instances of erythema and superficial scarring in the original mass, without functional activity limitations, are observed.

3. Results

All the removed tissues were sent for pathological examination, and 4 of the 6 tissues showed that the surgical margins were not clean. After the second cycle of PDT, the patient was discharged, and we regularly followed up on the phone and WeChat. The photos sent by WeChat all showed scar hyperplasia and no tumour recurrence. Two years later, the patient returned to the hospital for review. The physical examination revealed that the original tumour site mainly showed scarring after surgery, and no new tumours were found (Fig. 1). Both dermoscopic and pathological biopsies showed hypertrophy of the scar and no signs of tumour recurrence (Fig. 2).

4. Discussion

The ideal treatment for multiple BCCs should be effective, minimally invasive, and affordable. This patient had multiple high-risk basal cell carcinomas in the face and neck. Surgical excision or Mohs surgery would have resulted in a large wound on the neck, which would have inevitably required epidermal grafting. This type of operation is not only difficult and traumatic but also time consuming and expensive, and the wound is difficult to heal. Vismodegib is a Hedgehog-pathway inhibitor; it has been approved for the treatment of multiple BCCs, and it can effectively reduce the number of tumours, but it is expensive and has many side effects. Approximately 23% of patients may experience serious adverse events and even death during treatment [4]. In addition, topical therapy and cryotherapy have limited efficacy in BCCs, and

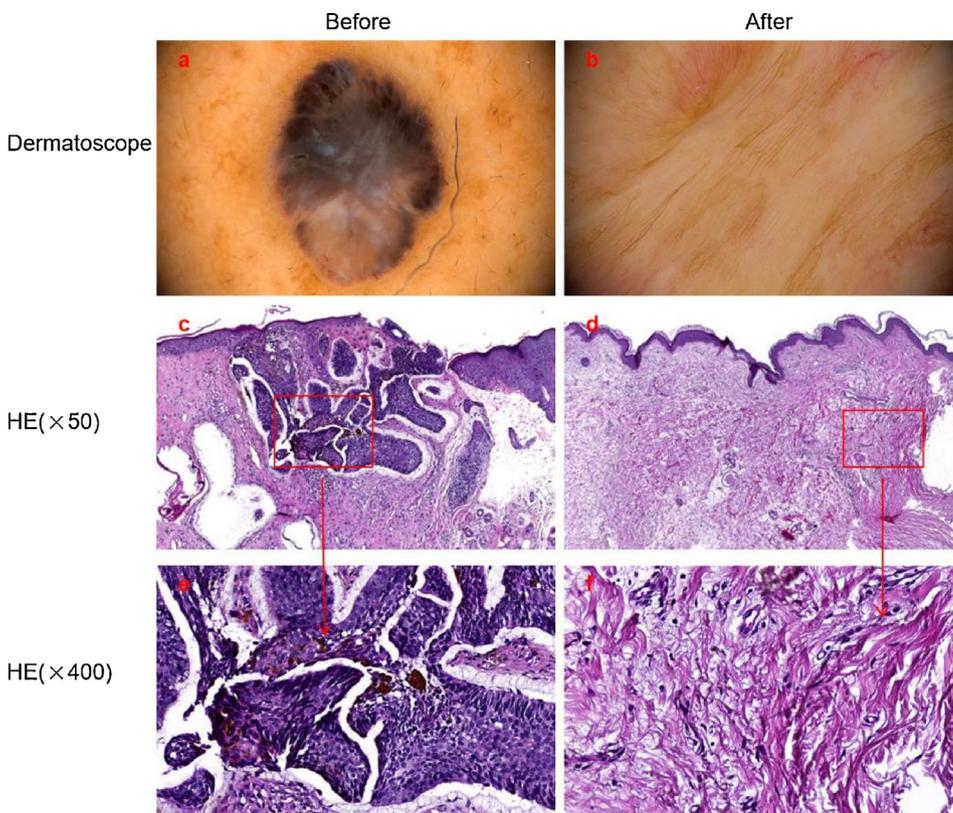


Fig. 2. (a, c, e): Dermatoscopy and pathology before treatment. The skin lesions under the dermatoscope do not contain pigmented mesh, and there are blue-grey ovoid nests, multiple blue-grey globules and maple leaf-like areas, as well as short, fine telangiectasias visible at the borders. Pathological biopsy revealed a basal-cell-like tumour mass, which was basophilic and heteromorphic, and tumour cells had invaded into the deep dermis. (b, d, f): Dermatoscopy and pathological biopsies after 2 years of follow-up. Dermatoscopy and pathological biopsies both show scar tissue and no tendency for tumour recurrence.

radiation therapy is not recommended because it may induce more tumours [5].

After comprehensive consideration, we used the method of surgical in situ resection of the tumour combined with two cycles of PDT to kill the potentially residual lesions, which compensated for the problem of large area lesions due to surgery and limited depth of photodynamic therapy at the same time. This method also avoids the need for skin grafting to relieve the patient's treatment costs and achieve the desired cosmetic effect. The shortcoming of the therapy is that some surgical margins are not clean, and the range of photodynamic therapy is limited. Although there has been only one case at present, more patients will be included in this treatment plan in the future.

There has been a previous report of the use of surgery combined with photodynamic therapy for facial recurrence of basal cell carcinoma with bone erosion [6], but our report is the first to demonstrate the treatment of multiple BCCs, which provides a new treatment option for multiple BCCs of the face and neck.

5. Conclusions

For BCC with multiple masses, surgery combined with photodynamic therapy is an economical, effective, and safe treatment option.

Author role

Each author contributed to the manuscript and has access to the data.

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Declaration of Competing Interest

All authors declare no conflicts of interest.

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