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Case report

Management of basal cell carcinoma with excision followed by rotation advancement flap

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Abstract

Background: Basal cell carcinoma (BCC) is the most common malignant skin tumor and is derived from pluripotent cells in the basal layer of the epidermis. One of the BCC management options is surgery followed by a skin flap to close the wound defect.
Case Illustration: We present a 43-year-old woman with a major complaint of non-healing sores on the left zygomatic region, close to the medial canthus, with frequent episodes of bleeding and itching since one year before admission. The lesion was excised and followed by histopathological examination, which revealed the BCC diagnosis with tumor-free edges. Closure of the defect with a rotation advancement flap was performed with good results.
Discussion: The diagnosis of BCC in this patient was based on history taking, dermatological and histopathological examination. According to the dermatological examination, the patient presented with superficial ulcers with hyperpigmented bases, irregular margins and raised edges, partly covered by crust in the left zygomatic region, consistent with typical clinical manifestation of BCC. Histopathological findings of BCC may vary according to the subtype. However, most cases of BCCs usually have similar histological characteristics.
Conclusion: The functional and cosmetic result of BCC following excision and defect closure with rotation advancement flap yielded good results with a shorter healing time.

Keywords: *basal cell carcinoma, excision, management, rotation advancement flap*

Background

Basal cell carcinoma (BCC) is one of the types of malignant skin tumors, originating from pluripotential cells in the basal layer of the epidermis. BCC may also arise from the outer roots of hair follicles, particularly stem cells located just beneath the channel of the sebaceous glands. BCC is usually slow-growing, locally destructive and rarely metastasizes because its growth is highly dependent on the stromal connective tissue at the location of the growing tumor.[1,2] BCC is more commonly found in individuals with light complexion than those with darker complexion. It is also more common in adults aged above 40 years old, with a higher incidence in men than women.[1,3]

BCC is typically found on sun-exposed areas, including but not limited to the nasal area, cheeks, periauricular, periocular, and neck areas. According to its clinical manifestations, there are five subtypes of BCC, i.e. nodular-ulcerative type, pigmented type, cystic type, superficial type, and morphea type with nodular-ulcerative BCC remains to be the most common subtype.[3,4]

Management approaches of BCC may be classified into two groups: (1) surgical approaches, such as curettage and electrodesiccation, surgical excision with scalpel, and Mohs micrographic surgery. A skin flap can be performed to close the primary defect.[5] (2) non-surgical approaches, such as radiotherapy and chemotherapy. Complete excision is one of the surgical techniques that is commonly used to

remove skin tumor. Surgical excision remains to be the gold standard in BCC management with histopathological examination.[1]

Skin flap is a surgical procedure of removing the parts of skin and subcutaneous tissue from certain body parts to the sites of skin defect with vascularization that is still attached to the place of origin. Flaps are commonly classified based on their primary motion. There are three basic types of tissue movement: advancement flap, rotation flap, and transposition flap.[6] Rotation advancement flap can be performed to close wide defect on the infraorbital cheek and the lower eyelid. [7] With proper and appropriate treatment, the prognosis of BCC is favorable.

Case Illustration

A 43-year-old woman presented to the outpatient clinic, Department of Dermatology and Venereology, Dr Pirngadi Hospital, with the chief complaint of non-healing wound, with episodes of bleeding on the left infraorbital cheek since a year before admission. Initially, a small white lump that felt itchy appeared and subsequently became a wound after the patient scratched the lump. Three months before admission the tumor enlarged. The patient had been treated at a community health center, but no improvements were observed, and the wounds continued to increase in size. No family history of such complaint was noted.

Dermatologic examination revealed well-defined superficial ulcers with hyperpigmentation and irregular edges measured 1.3 cm x 1.1 cm on the left zygomatic region, close to the medial canthus (figure 1A). According to the clinical findings, the patient was diagnosed with BCC with possible differential diagnoses of squamous cell carcinoma and malignant melanoma.

Routine laboratory examinations including complete blood work, blood sugar levels and clotting factors were within normal limits. This patient was subsequently planned to undergo excision, histopathological examination, and skin flaps. An aseptic procedure was performed using povidone-iodine and normal saline on the operating site. Surgical marking is done using 0.5% cm sterile gentian violet on the lesion border (figure 1B). We used a mixture of 2% lidocaine and normal saline with a 1:1 ratio for local anesthesia and incised the tissue using the no. 15 blade. Periprocedural bleeding was controlled by applying pressure and electrocoagulation.

Histopathology report revealed hyperkeratosis and acanthosis of the epidermis with the tumor mass forming islands between normal stromal tissue, dense, rounded and oval nucleated cells, hyperkeratotic, coarse chromatin, and little cytoplasm. Based on the histopathology examination, the definitive diagnosis of this patient was BCC of pigmented subtype. The superior, inferior, medial, lateral edge incisions were found to be tumor-free. The patient was then scheduled for a rotation advancement flap to close the defect (figure 1C). We took the flap donors from the maxillary region and planned the incisions from the nasolabial fold to the infraorbital region. We used tumescent for local anesthesia and a no. 15 blade to perform incision on the tissue. Following the incision, extensive undermining is conducted a few millimeters below the dermis, continued with an extensive closure by advancement flap and flap rotation technique medially. A simple interrupted suture technique was performed using 6/0 non-absorbable silk and 5/0 nylon thread (figure 1D).

Figure 1. The Complete Excision of Basal Cell Carcinoma and Rotation Advancement Flap

The patient was prescribed ciprofloxacin 500 mg, mefenamic acid 500 mg, and gentamicin ointment after the procedure. The patient was advised to keep the bandage dry and regularly change the bandage once every three days. We also counseled the patient to protect herself from direct sunlight by wearing a hat or sunscreen. Ten days following the operation, the flap was in good condition (figure 1E). After evaluating the patient's condition, we concluded that the prognosis of this patient was favorable.

Discussion

The diagnosis of BCC in this patient was based on history taking, dermatological and histopathological examinations. The patient was 43 years old; in line with the literature, BCC is often found at the age above 40 years old. The dermatological examination revealed superficial ulcers with hyperpigmented bases, irregular margins and raised edges, partly covered by crust in the region of the lower left eye, all of which were consistent with clinical manifestations of BCC. As a farmer, the patient was continuously exposed to sunlight during the day. Some researchers stated that the occurrence of BCC is associated with exposure to sunlight, skin type, skin color and other predisposing factors. Increased ultraviolet radiation, especially UVB rays, may predispose the patient to skin malignancies through immunological and carcinogenic effects of ultraviolet radiation. Transformation of cells into malignancy due to radiation is thought to be related to the changes in DNA, namely the formation of photo products called pyrimidine dimers that were thought to play a role in tumor formation and mutations in tumor suppressor genes.[1,3,8]

The patient complained about non-healing and pruritic wounds that often bled under her left eye since one year before admission. The lesion was initially a pruritic small white nodule which subsequently became a wound due to minor trauma. About three months before admission, a black hue appeared on the white nodule. According to the literature, BCC tends to appear on sun-exposed areas, particularly the face and neck region, which accounted for around 80% of BCC cases, while the rest are usually found on the truncal region and lower extremities.[2] A study conducted in Indonesia suggested the predilection of BCC on cheeks and forehead in 50% of cases, nose and nasal folds in 28% of cases, orbits and surrounding areas in 17% of cases, and the lips in 5% of cases.[9] Early BCC is generally characterized by small, translucent or pearl-like nodules with elevated areas and appearance of blood vessels. Clinical symptoms of BCC may vary according to its clinical subtypes. In our case, the patient had clinical presentation of pigmented BCC. In pigmented BCC, the histopathological findings include nodules of basophilic nests with melanocytes interspersed between tumor cells, and melanophages within stroma.[1] Nodular BCC is the most common clinical subtype, characterized by translucent papules or nodules, usually with telangiectasia and curled edges. Larger lesions with necrosis on the middle part of lesion are often called rodent ulcers.[2,5,6]

Histopathological findings of BCC differ according to its subtypes; however, most BCCs share similar histological characteristics: a group of tumors that form an island and peritumoral lacuna that can help histopathology diagnosis. The cells are relatively round with hyperchromatic nucleus and scant cytoplasm. Stroma of BCC consists of connective tissue.[10,11]

We performed excision surgery in this patient, followed by an advancement flap. Several modalities are available for BCC treatment, including surgical excision, tumor destruction through various modalities (curettage with electrodessication, cryosurgery), Mohs micrographic surgery (MMS) and topical chemotherapy. Complete excision surgery technique is considered the gold standard for BCC management with control of histopathological examination.[6,7,11] In our institution, complete excision surgery is a standard procedure for this condition, routinely conducted before flap or graft.

Several methods can be carried out to close the defect after excision. The decision regarding which method to implement is mainly based on the patient's general condition, the characteristics of the defect and the patient's preference.[10-12,14] Flap is the most common surgical method in cases of facial defects. Indications of flap include the large size of the defect and the need for excellent cosmetic outcome.[11,13,15] Rotation flap is created using adjacent tissue that is rotated to close a defect.[16] The flap rotation technique was chosen to reduce ectropion and scarring on the lower lid. The incision can be hidden so that it does not cause significant scarring. An advancement flap is carried out to resolve skin defects through tissue mobilization along linear directions. It can cover various sizes and shapes of defects located around the eyelids, glabella, forehead, cheeks, dorsal nose, lips, neck, and medial and lateral eye angles. The concept is the

simplest of all flaps, where the donor network is moved linearly to fill the defect.[11,14,17] Rotation flap on the cheek can cover a wide area with adequate blood supply. This type of flap can be easily manipulated with a pivot point that can be changed freely.[16] Factors to determine the flap type include the depth, size, and location of the tissue defect, the elasticity of the adjacent tissue and the relationship of the defect with adjacent anatomical markings, such as eyebrows and hairline.[12,14,17] Wide skin defect from cheek to lower eyelid eliminate the possibility of placing the incisional line on the subcilliary line. Attaching cheek flap to the periosteum from inferior or lateral of orbital bone could prevent excessive inferior traction of the edge of the lower eyelid.[16]

The prognosis of this patient was *quo ad vitam bonam, quo ad functionam, dubia ad bonam* and *quo ad sanactionam dubia ad bonam.* Following the literature, the prognosis of patients with BCC with appropriate treatment is very reassuring. However, close monitoring is needed following the treatment to evaluate the possibility of recurrence or new tumors. The prognosis of recurrent BCC is quite favorable. However, the tumor can reappear and become aggressive. It is estimated that 40-50% of patients with primary BCC will develop at least one or more subsequent BCCs in 5 years. Cases of metastases are sporadic with poor prognosis and an average survival of 8-10 months from the time of diagnosis.[2,12,14] Closing defects with this technique yielded remarkable outcomes with a shorter duration of healing.[14,17]

Conclusion

Reconstruction of soft tissue and skin defect in the cheek area remains a challenge. Rotation advancement flap is a suitable option of surgical procedure to close a wide defect in the cheek area after skin cancer removal as seen in our patient. A good result with short healing duration was observed.

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