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DEFECT CLOSURE AFTER WIDE EXCISION OF BASAL CELL CARCINOMA: A CASE SERIES

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Abstract: Defect Closure After Wide Excision Of Basal Cell Carcinoma: A Case Series*. Basal cell carcinoma is the foremost common skin cancer, accounting for 75-80% of nonmelanoma cancers. This malignancy is commonly found in sun-exposed areas like the face and neck. This malignancy rarely causes death, but it can result in significant local damage to the soft tissue, cartilage, and bone, impacting both function and aesthetics, particularly in the facial region. The main treatment for BCC is wide excision followed by reconstruction to close the defect. The choice of reconstructive procedure depends on various factors, such as size, location, involvement of deeper structures, cosmetic considerations, and function. There are various types of facial skin reconstruction, including local and regional flaps. This case series reports reconstruction of basal cell carcinoma after wide excision using local and regional flaps. Local and regional flaps provide matching skin color and texture as well as adequate blood supply. Both have superior aesthetic and functional advantages.*
Keywords: *Basal cell carcinoma, Local flap, Regional flap, Reconstruction, Case series.*

Abstrak: Penutupan Defek Setelah Eksisi Luas Pada Karsinoma Sel Basal : Laporan Kasus. Karsinoma sel basal merupakan penyakit kanker kulit terbanyak, 75-80% dari kanker nonmelanoma. Keganasan ini sering ditemukan pada area yang sering terkena paparan sinar matahari, seperti wajah dan leher. Keganasan ini jarang menyebabkan kematian, namun menyebabkan defek lokal yang luas mencakup jaringan lunak, kartilago, dan tulang, sehingga mengganggu fungsi dan estetika, terutama untuk daerah wajah. Penatalaksanaan utama KSB adalah eksisi luas dilanjutkan dengan rekonstruksi penutupan defek. Pilihan prosedur rekonstruksi bergantung pada beberapa faktor, termasuk ukuran, lokasi, keterlibatan struktur yang lebih dalam, faktor kosmetik, dan fungsinya. Terdapat berbagai macam jenis rekonstruksi kulit pada wajah, diantaranya adalah flap lokal dan regional. *Case series* ini melaporkan rekonstruksi karsinoma sel basal setelah eksisi luas menggunakan flap lokal dan regional. Flap lokal dan regional menghasilkan kecocokan warna dan tekstur kulit serta kecukupan suplai darah. Keduanya mempunyai keuntungan dalam hal estetik dan fungsional yang unggul.
Kata Kunci : Karsinoma sel basal, Flap lokal, Flap regional, Rekonstruksi, *Case series*

INTRODUCTION

Skin cancer is the third most prevalent cancer in Indonesia, following cervical and breast cancer. Keratinocyte carcinoma, a kind of skin cancer, is the most prevalent cancer in the world's population and poses a serious threat to global health. Eighty percent of all keratinocyte carcinomas are basal cell carcinomas (BCC) (Putri et al., 2022). Basal cell carcinoma refers to a malignant neoplasm that originates from basal cells located in the interfollicular epidermis or hair follicles (Huda et al., 2023). Basal cell carcinoma is the foremost common skin cancer, accounting for 75-80% of

nonmelanoma cancers (Tan et al., 2016).

The patient frequently has a slowly growing, nonhealing lesion with a pearly, translucent border that may bleed following minor injury; pruritus may also be present (Putri et al., 2022). Basal cell carcinoma has several risk factors, one of the best known is sun exposure. Most BCC are in locations that sun-exposed areas like the face and neck. Other risk factors include a history of radiation and genetic disorders such as albinism and xeroderma pigmentosum (Kevin et al., 2019; Suyuthie HD et al., 2022).

Management of BCC depends on the patient's age, size, location and type of lesion. The main objective of treatment is to eradicate the tumor, prevent its return, address any functional issues caused by the tumor, and achieve optimal cosmetic outcomes for the patient. BCC treatment is done through surgery, one of the methods being wide excision. Closure of skin defects resulting from wide excision can be done with reconstruction (McDaniel et al., 2024; Nopy Arianti et al., 2022; PERABOI, 2020).

The choice of reconstructive procedure depends on various factors, such as size, location, involvement of deeper structures, cosmetic considerations, and function. a variety of treatment modalities are available for reconstruction, from skin grafts to skin flaps. The results of skin grafts are not satisfactory in being able to cover extensive areas and the results of reconstruction with different skin colors (Shende, 2016).

A flap is a transfer of skin tissue along with the soft tissue underneath, which still has a vascular system. Defects from tumor removal vary in pattern based on the size and location of the lesion. Ideal facial reconstruction requires careful consideration of both color and texture to ensure a seamless blend with the surrounding tissue. Local flaps can be used to repair facial defects (Djawad et al., 2021).

This case series reports reconstruction of basal cell carcinoma after wide excision using local and regional flaps. Local and regional flaps provide matching skin color and texture as well as adequate blood supply. Both have superior aesthetic and functional advantages (Shende, 2016).

CASE PRESENTATION

In this case series, we report two patients with BCC who underwent wide excision of the tumor followed by local flap reconstruction in the first case and regional flap reconstruction for the second case.

CASE 1

A 55-year-old woman came to the Surgical Oncology with the chief complaint of a lump on the right cheek near the nose since 8 years ago. Initially, the lump appeared like an ordinary mole, but since the last 7 months, the lump has felt painful, itchy and oozing fluid. The patient is a farmer who has usually worked in places exposed to sunlight since he was a teenager without using sunscreen or personal protective equipment. The patient does not smoke and has no family history of cancer.

During the physical examination, a hyperpigmented tumor mass on the right cheek. The mass was well-defined, irregularly shaped, and had a single erythematous base. It exhibited positive tenderness and measured 1 cm x 1.2 cm x 0.5 cm in diameter. There was no regional lymph node enlargement.

The results of histopathological examination showed basal cell carcinoma with tumor-free incision margins. Based on clinical and physical examination, the patient was diagnosed with working basal cell carcinoma T1N0M0. The surgeon performed a wide excision with a 1 cm margin and closed the defect with a local flap.

Figure 1. 55-year-old woman with basal cell carcinoma of the face before surgery

Figure 2. Postoperative wide excision and reconstruction with local flap

CASE 2

A 60-year-old female patient came to the Surgical Oncology Polyclinic with complaints of a black lesion on the left cheek since 5 years ago with a small size. Since the last 2 years, the lesion begins to ulcerate, become painful, bleed easily, and is getting bigger. The patient is a vegetable seller at the market, selling daily from 07.00 - 14.00 WIB. Patients are often exposed to sunlight without using personal protective equipment and sunscreen. In addition, the patient has a family who complains of a similar disease.

On physical examination of the left preauricular region, a hyperpigmented, well-defined,irregularly shaped, single, erythematous lesion with a diameter of 4 cm x 3 cm was found with an ulcer in the center of the lesion. There was no regional lymph node enlargement.

The results of histopathological examination showed basal cell carcinoma with tumor-free incision

margins. The patient was diagnosed with working basal cell carcinoma T2N0M0 based on clinical and physical examination. A wide excision was performed with a margin of 1 cm and the defect was closed with a regional flap.

Figure 3. 60-year-old woman with basal cell carcinoma on the face before surgery

Figure 4. Wide excision and reconstruction with regional flap

DISCUSSION

Basal cell carcinoma is a type of non-melanoma skin cancer. This malignancy originates from the basal layer of the epidermis (Devi et al., 2023; Subagio et al., 2023; Topik & Alratisda, 2023). Basal cell carcinoma generally grows slowly with minimal soft tissue invasion, and has low metastatic potential. Previously, this condition was more often found in older men, but now it tends to be more often found in younger women (Devi et al., 2023; PERABOI, 2020).

BCC is the most prevalent type of cancer globally, with its incidence rising by 2-10% annually (Devi et al., 2023; Kang et al., 2019). The etiology of BCC remains unclear, but this malignancy is associated with several risk factors. BCC risk factors are divided into two, namely intrinsic factors and extrinsic factors. The intrinsic factor that has the biggest role is genetic, specifically gene mutations that cause loss of function of PTCH1 (Protein Patch Homolog 1) or over-activation of the smoothened protein (SMO), while the most influential extrinsic factor is exposure to ultraviolet (UV) light. The duration and intensity of UV light exposure are critical factors in the development of BCC. (FiedyaWati & Rudyan, 2022; McDaniel et al., 2024; Sari et al., 2023).

Basal cell carcinoma commonly affects areas of the body that receive frequent sunlight exposure, such as the head, neck, and extremities. 70% of cases occur in the head area (most often the face area and 30% the nose area) (PERABOI, 2020). BCC patients often come with complaints of lumps that get bigger over time, indistinct boundaries, ulcerations that bleed easily, telangiectasia, and rolled borders. Characteristics may vary according to the type of BCC. Based on the clinical picture, BCC can be divided into five subtypes, namely nodular, superficial, morpheaform, pigmented BCC, and Fibroepithelioma of Pinkus (FEP). The flow of establishing a BCC diagnosis consists of anamnesis, physical examination, supporting examinations, and histopathological examination with biopsy to determine the BCC subtype (McDaniel et al., 2024).

Management of BCC depends on the patient's age, size, location and type of lesion. The main objective of treatment is to eradicate the tumor, prevent its return, address any functional issues caused by the tumor, and achieve optimal cosmetic outcomes for the patient. BCC treatment is carried out through surgery, such as Micrographic Mohs Surgery (MMS), standard surgical excision, radiation, photodynamic therapy, and frozen surgery. One of the recommended therapies is wide excision with a safety margin of 0.5 - 1 cm. Closure of skin defects resulting from wide excision can be done with reconstruction. The selection of a reconstructive procedure is based on various factors such as size, location, depth of involvement, cosmetic concerns, and functionality (McDaniel et al., 2024; Nopy Arianti et al., 2022; PERABOI, 2020).

There are various types of facial skin reconstruction, one of which is a flap (Devi et al., 2023). A flap is a transfer of skin tissue along with the soft tissue underneath, which still has a vascular system. Key principles include selecting the appropriate flap type based on the location and size of the defect, considering the vascularity of the surrounding tissue, and planning the direction of the incision to preserve the neurovascular structure and minimize morbidity at the donor site. Flaps are classified according to blood supply (vascularization), tissue type, and location or distance between the donor area and the skin defect (Fortuna & Fasril, 2023; Saber et al., 2024).

Flaps based on vascularization are divided into two, namely axial flaps and random flaps. Random flaps originate from small arteries that do not yet have an anatomic name, while vascularized axial flaps originate from a dominant blood vessel source. Axial flaps are divided into island flaps, free flaps, and peninsular axial flaps. Flaps can also be classified according to the type of tissue involved. The flap can consist of one type of tissue or several types of tissue appropriate to the defect, for example, skin, fasciocutaneous fascia. This type

of flap is divided into cutaneous, fasciocutaneous, musculocutaneous, osteocutaneous, etc. flaps (Fortuna & Fasril, 2023; Saber et al., 2024).

In addition, flaps can also be differentiated based on the location between the donor area and the skin defect. This classification is divided into three, namely free, regional and local flaps (Fortuna & Fasril, 2023; Saber et al., 2024). A free flap is harvested from a separate area of the body, transplanted into the defect, and its vascular supply is reconnected through microsurgery. Composite flaps commonly consist of multiple types of tissue and always designed axially. Examples of these flaps include the anterolateral thigh flap, iliac crest flap, and gracilis flap (Fortuna & Fasril, 2023; Saber et al., 2024)

Regional flaps are sourced from the same area as the defect, for example, from the same limb or another part of the head and neck. Regional flaps are sourced from donor sites that are not directly next to the defect, in contrast to free flaps. They are typically axial (Fortuna & Fasril, 2023; Saber et al., 2024). Several things to consider when selecting a regional flap are the need for closure of large surgical wounds, protection of vital organs in the neck to avoid potential infection because of saliva. Regional flaps consist of many types, namely deltopectoral (DP), pectoralis major (PM), occipital, sternocleidomastoid, scalp, submental artery island, supraclavicular artery island flaps (Rigby & Hayden, 2014).

Local flaps are created by taking tissue from a donor site located right next to the area of tissue loss. This flap integrates the donor site into the closure procedure. When utilizing local flaps, it is crucial to take into account the pattern of the scar that will form and where it should be positioned within aesthetic subunits like the nasolabial fold. Local flaps depend on the random blood supply. Local flaps are predominantly employed for small defects involving primarily skin or mucosal tissue. These flaps are categorized based on the type of movement required to close the defect, namely rotational flaps, transposition (where the flap and other normal tissue adjacent to the defect switch places), interpolation (where the flap crosses both above and below the normal tissue to reach the defect), and advancement or advanced flap (stretching skin tissue that is pulled to cover the skin defect) (Fortuna & Fasril, 2023; Saber et al., 2024).

Defects from tumor removal vary in pattern based on the size and location of the lesion. Ideal facial reconstruction requires careful consideration of both color and texture to ensure a seamless blend with the surrounding tissue. Local flaps can be used to repair facial defects. The use of local flaps is frequently constrained by tissue availability and the size of the defect. Therefore, regional flaps are the preferred treatment for larger defects. A combination of local and regional flaps can be a viable choice for addressing complex defects (Djawad et al., 2021).

The two patients in this case series had more exposure to direct sunlight and did not use skin protection, such as sunscreen or hats. The environmental factor that plays the most role in BCC is accumulated exposure to ultraviolet light. Ultraviolet A and B are sunlight that is dangerous for the skin, especially ultraviolet B is more carcinogenic. UVB radiation can cause mutations in keratinocyte DNA and the formation of mutagens, resulting in potentially malignant cells appearing (Fortuna & Fasril, 2023).

Basal cell carcinoma is most often found in patients over 50 years of age (Kang et al., 2019). It is known that the latent period of cell damage because of UV light exposure occurs at around 20-50 years of age. As in these two cases, the patient is more than 50-years-old which could have the potential for BCC (Huda et al., 2023). In the history of these two cases, complaints of lesions and lumps on the face were found. Clinically, BCC often occurs in areas of actinic keratosis or areas that are often exposed to the sun, such as the face and back of the hands (Fortuna & Fasril, 2023).

The clinical findings in both patients are under the theory which states that BCC has clinical appearances

such as enlarged moles, bleeding easily, ulcers or ulcers. From the physical examination, you will get a classic picture of a rodent ulcer, namely an ulcer with one side that is uneven, like a "rat bite". Usually accompanied by hyperpigmentation at the edges and ulcers in the middle (Suyuthie HD et al., 2022).

On histopathological examination of these two cases, basal cell carcinoma was obtained. The patient then underwent wide excision and continued reconstruction using a local flap in the first case and a regional flap in the second case. A local flap involves transferring skin and subcutaneous tissue from a nearby donor site to close a surgical defect. This maintains a local blood supply through a connected vascular pedicle. Local flaps can be used for reconstructing the forehead and cheeks. The decision to use a local flap considers the amount of tissue available and the size of the surgical defect (Djawad et al., 2021). It is known that the satisfaction score of patients using local flap reconstruction is higher than skin graft (Lee et al., 2017). Local flaps have superior aesthetic and functional advantages (Rahman et al., 2016).

Regional flaps have long been believed to be an appropriate technique for skin reconstruction of the head and neck. A regional flap is the transfer of donor tissue that is not adjacent to the defect while maintaining the blood supply to the axial pedicle. There are several potential advantages to using regional flaps if necessary (Rigby & Hayden, 2014). Regional flaps are best used in fairly large defects because the use of local flaps is often limited because of the availability of donor tissue (Djawad et al., 2021). Local and regional flaps have the advantage of superior aesthetic and functional results (Rahman et al., 2016; Rigby & Hayden, 2014).

CONCLUSION

Basal cell carcinoma is one of the most common skin malignancies. This malignancy is often found in areas that are frequently exposed to sunlight, such as the face. The primary treatment for BCC is wide surgical excision followed by defect closure with reconstruction. The choice of reconstructive procedure depends on factors including size, location, involvement of deeper structures, cosmetic concerns, and functional considerations. In these two cases, considering anatomy, flap availability, and aesthetics, the skin reconstruction chosen was to use local flaps and regional flaps. Both have superior aesthetic and functional advantages.

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