

Microsurgical nasal reconstruction with a radial free flap. A case report

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Case Report

Plastic Surgery



Background

Basal cell carcinoma is a malignant tumor of epithelial origin, its growth is slow and it rarely metastasizes. This can produce local destruction and compromise extensive areas of tissue, cartilage and bone. There are clinical and histological variants and it is the most frequent cancer in humans and its incidence is increasing. The choice of treatment will depend on the size of the lesion, location, age and general condition of the patient. We present the case of a 68-year-old woman who came to the clinic with a 2 x 1.5 cm skin defect in the right nasal ala secondary sequel to resection of basal cell cancer two years ago. Microsurgical reconstruction was performed using a free Chinese flap to cover the skin defect. The free transfer of this flap for reconstructive purposes is still currently a reference procedure, mainly in reconstructive head and neck surgery.

Keywords: Radial free flap, basal cell carcinoma.

Skin cancer represents the most frequent malignant tumor worldwide, with basal cell carcinoma being the most frequent type of skin neoplasm. The true incidence of BCC is unknown. Although these skin tumors are very common, it is estimated that between 30% and 50% go unreported, either because they are removed without prior biopsy confirmation or because cancer registries in most countries are not required to report them. This tumor originates from the basal layer of the epidermis or from the bulb of the hair follicle. The main risk factors for BCC are older age, male gender, fair skin, low tanning ability, intermittent intense exposure to ultraviolet light during childhood, and cutaneous signs of actinic damage. The main clinical subtypes are nodular, superficial, ulcerated (rodent ulcers), morpheaform (sclerodermiform), fibroepithelial (Pinkus fibroepithelioma), and advanced (invasive). Histologic subtypes also vary and include nodular, superficial, morpheaform, micronodular, macronodular, infiltrative, pigmented, and basosquamous (metatypic) patterns. The main histological subtypes are nodular and superficial BCC, and the most common location is the head and neck area.

Although BCCs are usually slow growing and have a very low metastatic potential (0.0028%-0.55%), if left untreated they can cause significant tissue destruction, particularly when located on the face, and can even

invade bone and deeper structures. In the last decade, an increase in its incidence and a tendency to appear at earlier ages have been detected, possibly associated with the use of phototherapy and sun exposure. It affects both sexes. There are several therapeutic alternatives for BC, surgery being the most effective. Depending on the size of the lesion, location, type of BCC, general condition, age and aesthetic needs of the patient, the use of flaps is necessary. The blood supply for a random skin flap is from the musculocutaneous arteries near the base of the flap. Random skin flaps are frequently used in facial reconstruction and, depending on their extension and traction, they can be rotated, transposed, advanced, or tunnelled. Therefore, for the "survival" of these flaps it is important to consider the neurovascular supply and its variations in the dermal segments.

Case report

This is a 68-year-old female patient, originally from Guadalajara, Jalisco, housewife. Within his pathological history, he reported systemic arterial hypertension of 5 years of evolution with adequate control and a history of basal cell cancer in the right nasal wing diagnosed 3 years ago; From his non-pathological personal history, chronic smoking, suspended 6 months ago, and chronic sun exposure

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Figure 1. Side view. Right nasal wing defect secondary to resection of basal cell cancer.

stand out. His current condition began approximately two years, after resection of a tumor located in the right nasal wing, it presents with dehiscence of the wound and a fistula causing a 2 x 1.5 cm skin defect as a sequel, for which she went to clinical attention and was referred to this hospital. On physical examination, a patient with apparent chronological age, oriented in space, time, and person, with type 2 Fitzpatrick phototype, a 2 x 1.5 cm skin defect on the right nasal wing, with well-defined edges, with muscle exposure,



Figure 2. Design of the radial forearm flap



Figure 3. Primary closure of the defect in the donor area using a free graft

no data of infection (Figure 1). Pulmonary, cardiovascular and abdominal evaluation without apparent alterations. A surgical protocol is carried out, microsurgical reconstruction with a free Chinese flap is decided to cover the skin defect (Figure 5).

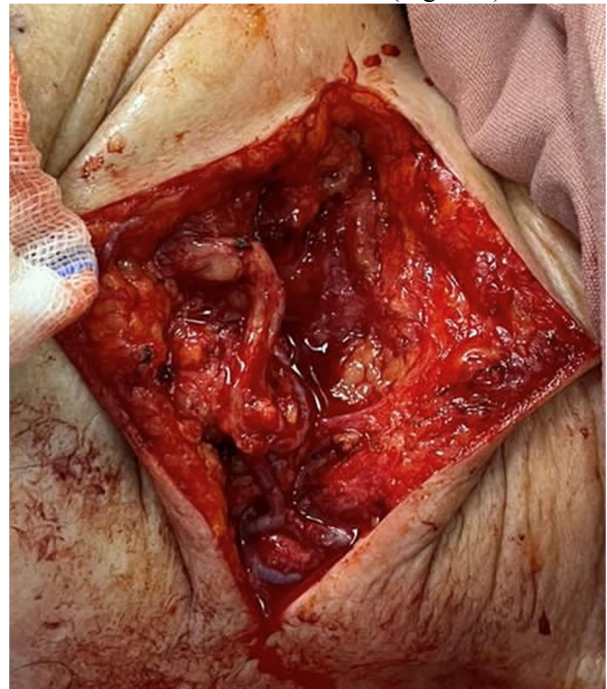


Figure 4. Facial artery with radial artery anastomosis



Figure 5. Front view. Immediate postoperative period of microsurgical reconstruction with free Chinese flap.

Discussion

Basal cell carcinoma (BCC) corresponds to 75-80% of non-melanoma skin cancers. It is a non-melanocytic skin neoplasm that arises from the basal cells of the epidermis or from hair follicles, and which, being locally invasive and slow-growing, can result in great cosmetic disfigurement. BCC is more frequently observed in photoexposed areas due to the chronic accumulation of ultraviolet radiation. It occurs mainly on the face, being more common on the nose, specifically on the nasal tip and wings; and in light-skinned patients. In almost all cases, treatment is surgical and includes methods such as Mohs micrographic surgery, conventional surgical excision, liquid nitrogen cryosurgery, and electrodissection with curettage. Techniques vary based on staging, subtype, location, availability of treatment, comorbidities, and patient wishes. In advanced cases, as well as in those not apt for surgery, other alternatives such as radiotherapy, photodynamic therapy, or even pharmacological treatment can be used in small, low-risk cases of BCC. The goal of the selected treatment is to ensure complete removal of the tumor, preserve function, and achieve a good cosmetic result, without stricture or distortion.

The success of each surgery lies in the details. Nasal reconstruction following skin cancer should be approached gradually, using the least invasive method that can most appropriately repair the defect. The following options should be considered: primary closure by planes, closure by secondary intention, local flaps, split-thickness grafts, full-thickness grafts, nonvascularized composite flaps, vascularized regional flaps, free microvascular flaps. When choosing a reconstructive procedure, one should prefer to select the one that has the least morbidity while offering the highest probability of functional and cosmetic success. Only small nasal defects can be repaired with one-stage techniques. Rotation flaps, transposition flaps, V-Y-plasties, bilobed flaps, and subcutaneous pedicled sliding flaps are the standard techniques. They offer the possibility of replacing the missing tissue with one of similar color, texture and porosity. When choosing a flap to perform the reconstruction, one must consider the availability of tissue in the nose, the diameter of the lesion, the orientation of the scar with respect to the lines of tension, among other factors. The skin of the nasal tip and ala is sebaceous and thick, so flaps originating from these sites can commonly cause asymmetry of the distal nose. The architectural stability of the nasal ala should also be considered before performing a flap at the distal nasal level. If the lateral wing lacks support, the additional weight of the flap will cause alar collapse with consequent functional compromise.

The choice of therapeutic procedure will depend on the resources available, the skill in handling one technique or another by the person doing the treatment, the anatomical location of the lesion, its size, and the individual characteristics of the patient. In patients with basal cell carcinomas, surgery continues to be an excellent option, with the use of skin flaps for post-resection closure of the tumor. The displacement and relocation of skin segments following aesthetic planes allow an adequate closure, with minimum distortions and scars, which provides very convenient therapeutic possibilities for those affected and a good prognosis with little physical discomfort and marked defects, which makes this treatment alternative one of the first choice to treat these cases. The selection of donor tissue in the reconstruction of a head and neck defect depends on multiple factors such as the clinical situation of the patient and comorbidities, the size and shape of the defect, the state of the neck vessels and also preferences, the experience and training of the surgeon. Microvascular flaps offer the possibility of choosing tissues that best fit the defect to be repaired.

The reliability of the radial forearm flap is based on its anatomical characteristics and the relatively constant location of the radial vessels, which condition its easy dissection. In addition, this makes it possible to extract a long vascular pedicle, with an abundant venous drainage network, making it possible to use the cephalic vein if necessary. The skin and subcutaneous cellular tissue of the area are thin, which facilitates its use in covering defects that do not require excessive amounts of tissue, in addition to the fact that these characteristics allow the reconstruction of irregular defects due to its great three-dimensional adaptation. In this case, microsurgical reconstruction was performed using a free Chinese flap to cover the skin defect post-resection sequelae of basal cell carcinoma, with a satisfactory clinical evolution of the patient, without complications, without functional sequelae, and excellent cosmetic results. The great utility of skin flaps is demonstrated, with favorable aesthetic and functional results.

Conclusion

Basal cell carcinoma is one of the main etiologies that will require nasal reconstruction. The technique of said reconstruction will depend on numerous factors such as the donor site, the recipient site, the defect to be repaired, the technique used and the experience of the surgeon. The nose is the most prominent part of the face, and there are so many surgical options, one must know how to choose the most appropriate one, remembering that although the results may be optimal, without experience or the right choice, the result can be disastrous. The radial forearm microvascularized flap (CMAR) is a widely used tool in reconstructive surgery. It is a very versatile tool that allows the reconstruction of a large number of locations in which the head and neck surgeon works.

Conflicts of interests

The authors declare that we have no conflicts of interest for the publication of this clinical case report.

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References

1. Guillén J, Miranda D, Longo A. Resection of invasive basal cell carcinoma of the nose. Medical Journal of the College of Physicians and Surgeons of Guatemala, 2021 Apr;160(L: 2664-3677):55–7.
2. Cristy Darias Domínguez, Jessica Garrido Celis. Basal cell carcinoma. An actual challenge for the dermatologist. Rev Méd Electrón 2018; 40 (1).
3. Álvarez CA, Rodríguez AJM, Salas BA. Systematic review of basal cell carcinoma. Synergy Medical Journal. Vol.5 Num:5, May 2020, e483
4. Bolado-Gutiérrez, P., Casado-Sánchez, C., Landín-Jarillo, L. Closure of radial forearm flap donor site using a rotation-advancement flap based on ulnar perforators. Iberoamerican plastic surgery. vol. 39 no.3 Madrid jul./sep. 2013
5. Eduardo Ferrandis, María Antón, Alberto Guillén Martínez. Versatility of the radial forearm microvascularized flap in head and neck reconstruction. A series of 58 cases. Spanish Otorhinolaryngology Act Volume 71, Number 5, September-October 2020, Pages 275-280.
6. Eduardo Brenes Leñero, Loretta Piccolo Johanning. Nasal reconstruction techniques after resection of a basal cell carcinoma. Clinical Journal of the UCR School of Medicine - HSJD Year 2016 Vol 1 No 1.

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