

## Nasal flap or cutaneous grafting in basal cell cancer of the nose. Comparison of two reconstructive possibilities

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**SUMMARY: Nasal flap or cutaneous grafting in basal cell cancer of the nose. Comparison of two reconstructive possibilities.**

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Background. Basal cell cancer is a malignant tumor of the skin most common in Caucasians and more common in the areas of the head and neck.

At the moment there are many suggested treatment methods, however the surgical approach remains the technique most often applied. It includes excision of the oncological safety margins and the subsequent reconstructive phase can utilize local flaps or cutaneous grafts.

This study aims to select the best technique for the reconstructive phase after removal of basal cell cancer from the region of the nasal pyramid, evaluation was made in terms of functional performance and aesthetics.

We have evaluated 30 patients, of whom 15 treated with cutaneous grafting and 15 with flaps.

KEY WORDS: Basal cell carcinoma - Flap - Cutaneous graft.

### Introduction

Basal cell carcinoma is by far the most common malignant tumor among Caucasians, which can derive from cells of the epithelial basal layer or from the external root sheath of the hair follicle. Most of basal cell carcinomas develop on bright haired individuals with increased exposure to sunlight, X-rays, or ultraviolet light for prolonged periods of time. Head and neck are the most susceptible areas in the body for these types of cutaneous lesions (1-3).

At present there is a variety of treatment methods according to the localization, type, dimensions and age of the patient (4).

The treatment plan suggests the control of local spreading of the tumor that rarely sends off distant metastases (5-8). The surgeon, then, has a few options for the reconstructive phase, and can act immediately or in a later phase (9-11). Another treatment option is the reconstruction with a local flap or with a cutaneous graft according to the local condition and stage of the disease (12).

Less common treatment options includes irradiation, cryotherapy and topical application of drugs like 5- fluorouracil (13).

Among the various treatment modalities, the surgical approach remains of primary importance, with excision of the basal cell carcinoma with net safety margins and closure with a local flap or with a cutaneous graft (14, 15).

Attention was focused on deciding which is the better technique for the reconstructive phase after removing basal cell cancerous tumors of the nose, in order to give not only a better functional performance, but also a good aesthetic result. In fact, there are problems associated with the use of local flaps or

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autologous graft, which made a primary evaluation necessary, according to the single case. Reasons that make the use of flaps problematic are: profile deformity, the need of a good understanding of surgical and microsurgical techniques, the best choice of graft location (16). Also, the formation of folds at corners can be the cause of frequent secondary surgeries (17). The cutaneous graft for this type of lesion are preferably harvested from the preauricular, retroauricular and supraclavicular region and rarely from the internal part of the arm. These grafts don't always lead to a reasonable aesthetic result, due to the lack of corresponding colors from the graft site to the donor site, and sometimes to an insufficient tissue thickness. However, cutaneous graft is still preferred for the concealment of excision defects, especially graft taken from preauricular or supraclavicular regions.

The cutaneous graft is one of the most ancient reconstruction techniques: already 1000 years ago Indian doctors transplanted cutaneous tissue taken from the gluteus region to repair nasal tissue defects.

## **Patients and methods**

We have evaluated 30 patients (mean age 62 years  $\pm$  12) undergoing reconstructions of defects in the nasal region secondary to basal cell carcinoma excision. 15 patients were treated with cutaneous graft and 15 patients were treated with flaps. All patients have been treated between 2008 and 2011 in the Department of Surgical Sciences of "Sapienza", University of Rome. We evaluated the aesthetic outcome after 12 months from the operations. All the patients have been subjected to surgery under local anesthesia and the basal cell carcinomas were all removed with a 2 or 3 mm margin of healthy tissue. In 5 patients the tissue was taken from the preauricular region, in 6 patients was taken from the retroauricular region, in 2 patients from the supraclavicular region and in 2 patients from the internal part of the arm (Table 1).

The cutaneous graft was harvested to include the superficial layers of the subcutaneous tissue (Figures 1, 2). The skin graft thickness was adjusted according to the need of the receiving site in every patient. The cutaneous graft was accurately deprived of fat tissue prior to the transplantation in the receiving site.

After an accurate hemostasis, the tissue defect after the excision of the basal cell carcinoma was covered by the cutaneous graft (Figure 3). This technique has been chosen for the closure of defects in the alar region, the tip of the nose and the dorsal region, respectively in 7 patients with basal cell carcinoma of the back of the nose, 4 with lesions of the ala and 4 with lesions of the tip. Medication has been applied to avoid the formation of hematomas or seromas and to guarantee the immobilization of the graft. The needed size of the cutaneous graft varied from 4 x 3,5 cm to 1 x 1 cm. The mean follow-up was 12 months (Figure 4).

Of the 15 patients treated with flaps, 12 were treated with flap of nasal alar groove. Before surgery the scoop outline was drawn and resulted to be parallel to the nasal alar groove, with length-width ratio of 5:1. The flap was excised along the alar groove, removing skin and subcutaneous tissue, at least at the proximal third. Later was transposed over the missing tissue according to the desired procedure. The flap was degreased where necessary and hair follicles ablated.

The basal cell carcinoma was located in the dorsal region in 6 of these patients, in the alar region in 3 patients and at the tip of the nose in 3 patients.

The remaining 3 patients, all with lesions of the dorsal region of the nose, were treated with a frontal flap or with an island-shaped flap (converse), in case of involvement of the alar groove, trying to avoid torsion.

The donor site was closed with simple sutures or H-shaped plastic procedure.

In all our patients we tried to maintain the ratio among the various aesthetic subunits with curettage. The mean follow-up was 12 months as well (Table 2).

## **Discussion**

Patching of nasal defects after surgical removal of basal cell carcinomas of the nasal region is usually quite difficult from an aesthetic point of view (19). The nose is an extremely important area situated in the center of the face, and is high the risk of distortion of the nasal profile after the excision of the lesion (20). Our experience tells us that the advantages of using grafts are to perform a single surgery, the minor retraction rate, the maintenance of good

TABLE 1 - PATIENTS SUBJECTED TO GRAFT RECONSTRUCTION SURGERY.

Patient number	Age	Sex	Graft size (cm)	Donor site	Receiving site of the nose	Local status
1	54	F	1,5 x 1,5	Preauricular	Dorsum	Excellent
2	60	M	4 x 3,5	Supraclavicular	Ala	Excellent
3	58	M	1,5 x 1	Preauricular	Ala	Good
4	60	F	1 x 1	Preauricular	Dorsum	Good
5	65	F	2 x 1	Preauricular	Dorsum	Good
6	50	M	1,5 x 1	Preauricular	Tip	Good
7	52	F	2 x 1	Arm	Tip	Different pigmentation
8	72	M	2 x 2	Arm	Ala	Good
9	68	M	2 x 2	Supraclavicular	Dorsum	Different pigmentation
10	52	M	2 x 2	Retroauricular	Dorsum	Excellent
11	58	F	1,5 x 1	Retroauricular	Dorsum	Excellent
12	75	M	1 x 1	Retroauricular	Ala	Good
13	59	F	2 x 1	Retroauricular	Dorsum	Good
14	74	M	1 x 1	Retroauricular	Tip	Good
15	57	M	2 x 1	Retroauricular	Tip	Excellent

ratio among the aesthetic anatomic subunits and the possibility to maintain reconstructive options in case of recurrence.

Time improves the appearance of the graft, with a good integration of the transplant after 12 months.

The main drawback is the low engraftment rate for full length grafts, having the necessity for richly vascularized beds, located in areas of exposed cartilage where the perichondrium has been removed and the bones deperiostated, determining to prevent their implementation in wider areas of demolition.

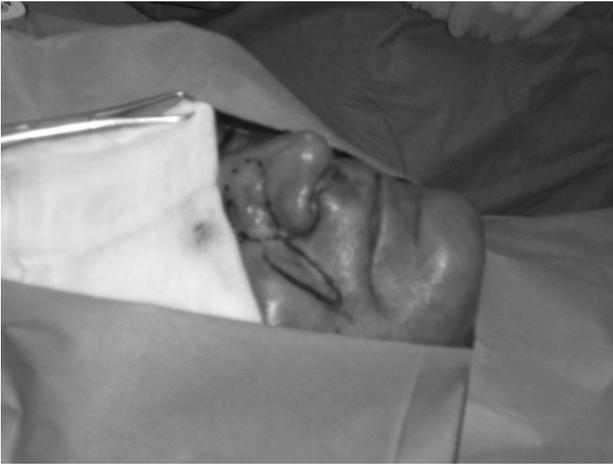
In the choice of flaps there are advantages to treat wider areas of missing tissue, mostly corresponding to the colors of the donor and receiver site along with larger width of repair tissue, corresponding to an autonomous source of vascularization (21).

Providing wide margins is an advantage for the repair of the margin tension, which can result in an

increased sensitivity of nose distortion, especially when tensions are greater at the tip of the nose. Distortions can occur in functionally active structures, for example the periorbital eyelid, that need a flexible reconstruction with minimum distortion. Harvesting sites for local flaps can add extra scar tissue that frequently crosses the aesthetic subunits of the nose and are easy to clear. For example, with the realization of bilobed flaps can be achieved a good covering of the tip of the nose, however this can increase the amount of scar tissue formation, which makes this type of procedure less attractive (22).

Usually the rotation of the flap on the alar-nasal rim results in a loss of tissue with a non-aesthetic flattening of the area that will have to be reproduced with difficulty in a second surgery.

The trapdoor phenomenon was observed in 3 patients treated with cutaneous flaps. This phenome-



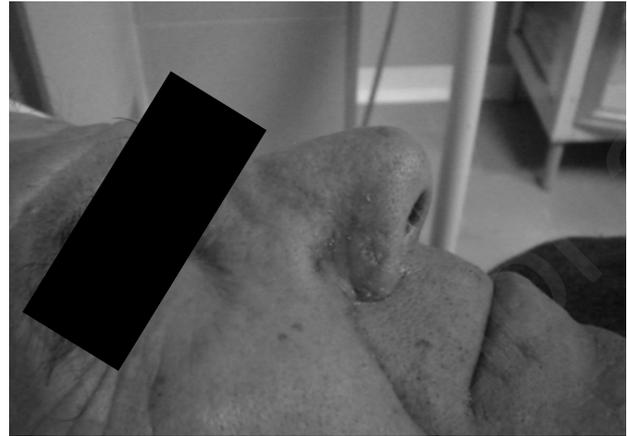
**Figure 1 - Preoperative view of a patient with a basal cell cancer of the alar region of the nose.**



**Figure 2 - The tumor is excised and the flap harvested.**



**Figure 3 - Immediate postoperative view.**



**Figure 4 - Result after a 12-month follow-up.**

non could be derived from the scar contraction with a minor aesthetic outcome. The banner flap, used for the closure of nasal tip defects, can lead to an asymmetric elevation of the ala, an event presented in 1 of the patients (23, 24).

For every patient that underwent immediate reconstructive treatment after surgical removal of basal cell carcinomas following a cutaneous graft taken from the preauricular, retroauricular or supraclavicular region, there were good aesthetic results, excluding one patient in which the graft had a different cutaneous pigmentation. Of the 2 patients where a graft was harvested from the internal region of the arm, only one presented a poor aesthetic outcome (25-27).

Preauricular and retroauricular regions are ideal as donor sites in the reconstruction of the head and neck. The preauricular skin is probably the most accessible within the donor sites on the head and neck region, which permits a graft in the appropriate form and dimension in most cases.

The supraclavicular fossa corresponds to the best cutaneous pigmentation, however the thickness is non-optimal. Supraclavicular scars are also to avoid, especially in women (28). The preauricular incisions heals in a very good way, especially in elderly patients. Another important advantage of using cutaneous graft is that is technically less demanding than the local flap, without prominent added scarring (29). With this technique, scars are well hidden at the reconstruction and donor site (30).

The main limit is that the revascularization of the receiving vascular bed is limited.

The biggest composed skin graft used in these

TABLE 2 - PATIENTS SUBJECTED TO FLAP RECONSTRUCTION SURGERY.

Patient number	Age	Sex	Flap size (cm)	Donor site	Receiving site of the nose	Local status
1	67	M	1,2 x 1	Geniena	Ala	Good
2	65	M	1,5 x 2	Geniena	Ala	Good
3	58	F	3 x 2	Frontal	Dorsum	Excellent
4	60	F	2 x 1	Frontal	Dorsum	Excellent
5	71	F	2 x 2	Frontal	Dorsum	Scar retraction
6	60	M	2 x 3	Geniena	Dorsum	Excellent
7	52	M	3,5 x 2	Geniena	Tip	Good
8	58	M	2 x 1	Geniena	Ala	Good
9	74	F	2 x 2	Geniena	Tip	Asimmetric ala
10	72	M	1,5 x 2	Geniena	Tip	Good
11	57	F	3,5 x 4	Geniena	Dorsum	Scar retraction
12	59	M	3 x 2	Geniena	Dorsum	Good
13	60	M	3 x 2	Geniena	Dorsum	Scar retraction
14	58	F	4 x 2	Geniena	Dorsum	Excellent
15	60	F	2 x 2	Geniena	Dorsum	Excellent

patients was 3,5 x 4 cm. Initially it developed epidermolysis with superficial desquamation. However, this was subsequently fixed with a new layer of epidermis without the necessity to perform a second surgery (31, 32). Both the thin graft (Thinthiersch-Ollier, between 1,5 and 2,5 decimillimeters thick) and the medium thickness graft (Padget, between 3 and 6 decimillimeters thick) have very little indication for the nasal pyramid, but could be used as temporary replacements, as in situations like burns, where the use of a flap is limited.

The choice to use a graft or a flap is based on the availability of the donor sites in correspondence with color, the best aesthetic outcome, depth and dimension of the tumor. In case of wide and deep loss of tissue, the flap is more recommended because it offers better width, aesthetic equilibrium and guarantees the functionality of the area.

## Conclusions

The cutaneous graft used in post-surgical defect reconstruction following surgical removal of basal cell carcinomas of the nose has been used with much success in a series of 15 patients. There was satisfying aesthetic outcome in almost all of them, excluding 2 in which we observed different skin pigmentation. The donor site was the preauricular region of the face and neck, the supraclavicular region and in 2 patients the volar region of the arm, due to a wide local demolition that made necessary to acquire a wider graft. This technique offers various advantages including an adequate thickness of the skin graft with removal of superficial tumors avoiding distortions and added scarring. It was recommended to extend the excision margins of the basal cell carcinoma when reasonable, until the limit of aesthetic sub-

units with repair of the whole subunit. If the nasal defect is compromised of more than 50% of the aes-

thetic units, the excision can be widened to the borders of the aesthetic unit during the reconstruction.

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