# Use of human fibrin sealant in large split thickness skin grafting after massive skin tumour excision

TO THE EDITOR: Skin grafting is one of the most used technique for wound coverage.[1] The main factor in graft adherence is the condition of the wound bed, that must be well vascularized. The same importance has the prevention of the haematoma or seroma development in the contact between the skin graft and the wound bed. In order to avoid these conditions, classical "tie over bolster" is an advisable technique to achieve an optimal adhesion. For the same principles, it is also recommended to mesh the grafts and put a compressive dressing.[2]

In case of extended wound and in difficult areas where is not easy to gain a three-dimensional reconstruction (for example in lower limb reconstruction, hand surgery, post traumatic and burn surgery), the use of the classical methods are difficult to achieve and not always satisfactory.[3]

In these cases, wound healing could be impaired causing a partial adhesion of the graft.

Nowadays more and more experimental evidences [4] suggest that fibrin glue should be considered as component of skin-graft management.

Human fibrin glue provides manifold advantages combined with skin grafting. Firstly, fibrin glue preparation is easy and fast. The solutions are accessible to the operating room and easily prepared by the circulating nurse or scrub technician.

We describe the use of Quixil®, a sealant based on fibrin derived from human plasma, for skin grafts fixation on large defects due to the removal of massive skin cancers.

We selected 33 patients with extended skin cancer in which reconstruction with flaps was not recommendable considering their comorbidities and the extension of the defect after tumour excision. We compared this group to other 61 patients, similar in ages and clinical condition, where split thickness grafts were applied without fibrin glue.

Between February 2009 and February 2012, 33 patients (20 males and 13 females) was treated with human fibrin glue combined with skin grafting. This includes patients with an average age of 83 years (range from 71 to 98 years). We chose grafts as reconstruction method instead of flaps considering old ages of the patients, their comorbidities and large extension of the defects.

TABLE I.—*Sites of skin tumors.*

| Localizazion | N. of cases |
|---|---|
| Upper limb | 6 |
| Lower limb | 6 |
| Head | 15 |
| Pelvis | 1 |
| Neck | 2 |
| Trunk | 2 |
| Buttocks | 1 |

The aetiology considered in the study was coverage of defects after removal of massive skin cancer. The localization of the wounds is exemplified in the Table I.

The average area grafted was 185cm2 (range from 48 to 303 cm$^2$), and grafts were 0.2 to 0.3 cm thick.

In 30 % of cases we meshed the grafts 1:3 and we used sutures stitches and staples almost in all cases.

The skin graft and donor site were covered by non-adherent dressing and a secondary medication of sterile gauzes over it. Skin grafts dressing were removed 5 days after surgery.

The percentage of the graft adherence was clinically evaluated and estimated thanks to a digital software (Bersoft Software Measurent 8.15) (Figure 1).

At an average follow up of 78 days, in 28 out of 33 patients (84.8%) more than 95% of the graft dimension adhered. In 3 out of the 5 cases where graft adherence was less of 95% (Table II), the graft was positioned over skull bone, after tumour excision that reached the periosteal tissue. In one case the skin graft was applied after removal of a tumour of the cheek invading the superficial lobes of the parotid gland, where salivary secretion probably impaired the adhesion of the graft and the surgical sealant effectiveness. In the last case graft did not adhere completely due to the not oncologically radical excision (debulking) of the tumor and its coherent growth after skin graft application.

In the 28 positive cases, the common complications of skin grafting (such as necrosis, infection, sliding, haematomas and seromas) were not observed.

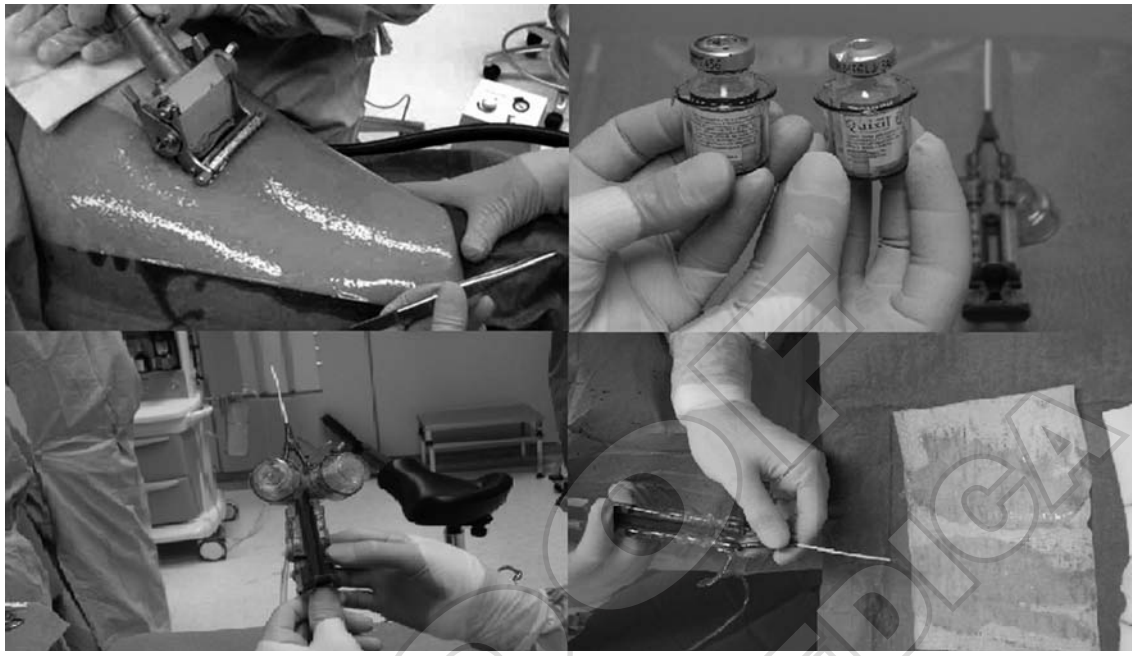

Figure 1.—Preparation of split thickness grafts with fibrin sealant.

Figure 2.—Seventy-eight year patient with skin tumor excision and reconstruction with split thickness skin graft and human fibrin sealant.

TABLE II.—*Description of the 5 unsuccessful cases.*

| Age | Sex | Diagnosis | Location | Grafted area cm² | Adherence (%) |
|---|---|---|---|---|---|
| 83 | M | Squamous cell carcinoma | Scalp | 100 | 80 |
| 86 | M | Squamous cell carcinoma | Scalp | 160 | 70 |
| 79 | M | Squamous cell carcinoma | Scalp | 90 | 80 |
| 71 | F | Squamous cell carcinoma | Cheek | 130 | 50 |
| 73 | M | Squamous cell carcinoma | Ankle | 100 | 50 |

During our period of observation (from February 2009 and February 2012) we followed 61 "over 65" (range from 66 to 94 years) patients who underwent extended tumor excision with reconstruction with split thickness grafts without using fibrin sealant. Patients with complete adhesion (>95%) of the graft were 72%. In the other patients (17 out of 61) the technique failed due to infection (30%, 5 patients), haematoma (17%, 3 patients), sliding of the graft (47%, 8 patients) and seroma (6%, 1 patient) (Figure 2).

Analyzing the results obtained and comparing the two groups, we think that human fibrin sealant should be used in three dimensional defects (for example in anatomical fold) or when the defect is extended and fixation with staples or tie over dressing could be inadequate.

The major problem of fibrin sealant is the additional cost for the product.

We believe that, in the complications of split thickness graft more common in the conditions just illustrated, the occurence of complication as infection, haematoma, seroma would require a long term medication of the recipient zone increasing the total cost of the single patient management.

The results observed in our patients suggest how human fibrin sealant could be taken in consideration in split thickness grafting reconstruction technique where defect after tumour excision is extended or it has a three dimensional shape.

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