

Double Helix Flaps for Lower Leg Defects: Report of 4 Cases

Sir,

When a direct closure is not suitable, the reconstruction of surgical defects on the lower extremities may be problematic, because the leg skin is tight and difficult to mobilize.

Full or split-thickness skin grafts are generally used to restore larger defects (>4 cm in diameter).^[1] However, they often require long healing times and achieve poor aesthetic results. Traditional skin flaps have a limited role at this level, even to restore small or middle size losses, because of the relevant risk of complications such as flap ischemic necrosis, suture dehiscence or infections.^[1] In addition, graft or flap failure favours the development of leg ulcers, especially in elderly with vascular deficiencies.

Promising results have been recently reported with the use of new flap techniques such as the 'reducing opposed multi-lobed flap', the 'opposed bilateral transposition flap', and the keystone flap.^[2-4] However, these procedures have been applied only in small case series or single case reports.

We report our experience with the use of double helix

flaps (DHF) for the reconstruction of large lower extremity defects following tumour excision. This procedure is a variant of the 'single' helix flap technique, which was first utilized by Turkaslan *et al.*, in 2009 to restore circular defects in different body regions.^[5] Two opposite helix flaps are raised down to the fascia and rotated into the wound. Every flap encompasses the defect radius in width, and it is harvested as an island flap proximally, while its distal half is completely undermined. Deep and superficial interrupted sutures are placed as necessary (we prefer 3-0 vicryl and 3-0 nylon suture). Before our series, the DHF technique had been utilized only in a patient to restore a large surgical defect on the back.^[6] However, DHF shows similarities with the traditional "O-to-Z" flap technique (already utilized to restore wide defects on the legs); therefore, it might be considered a variant of that procedure.^[7]

Over 2 years, the DHF procedure was performed in 4 patients (3 men and 1 woman) aged 69-79 years (mean: 74 years) to cover skin wounds on the lower legs, after excision of skin tumours [Table 1]. The preoperative diagnosis was clinical or, in some cases, histological. Squamous cell carcinomas were excised with 1 cm of free

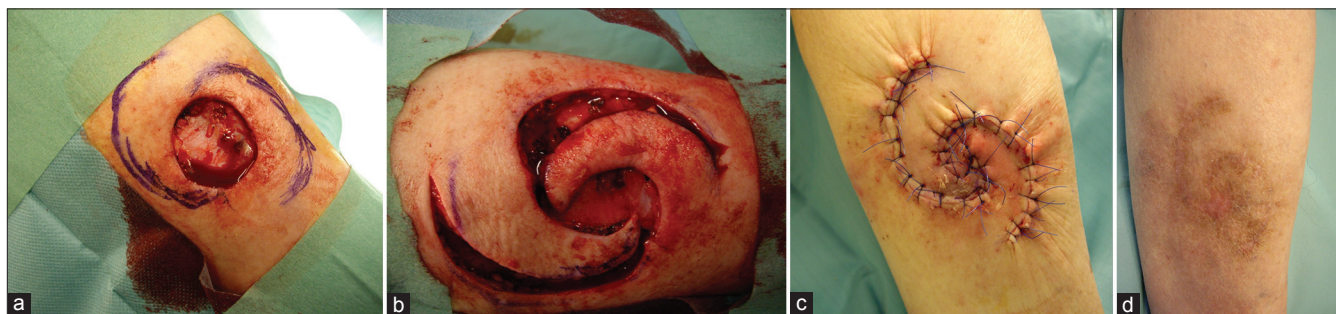


Figure 1: (a) Patient 1. Residual defect after Mohs micrographic surgery and double helix flap design, (b) Flaps rotate and advance to cover the defect, (c) Final suture, (d) View after 10 months



Figure 2: (a) Patient 4. Squamous cell carcinoma on the right leg, (b) Incision of double helix flaps to restore the postsurgical wound, (c) View after 5 months

Table 1: Patient and tumour data

Patient number	Sex	Age	Tumour type	Histological variant	Defect size (mm)	Follow-up (months)
1	M	72	BCC	Nodular	50×45	13
2	F	79	BCC	Nodular	35×35	10
3	M	76	SCC	Well-differentiated	40×35	8
4	M	69	SCC	Well-differentiated	0×40	5
Mean		74			41×39	9

M: Male, F: Female, BCC: Basal cell carcinoma, SCC: Squamous cell carcinoma

margin, while basal cell carcinomas were treated with Mohs micrographic surgery. Defect sizes varied from 35 × 35 to 50 × 45 mm (mean: 41 × 39 mm).

No relevant complication was observed during a mean follow-up of 9 months (range 13-5 months). Functional and cosmetic results were satisfactory in all cases. Three patients had a limited distal flap necrosis, which resolved completely within 3 weeks with local medications. Two cases are illustrated in Figures 1 and 2.

Based on our experience, the DHF technique appears an easy, time-sparing and valid procedure for a single-stage coverage of large skin losses, especially when localized on body areas with poor mobile skin, like the lower leg. No modification of the original circular defect shape nor extra skin excision are required. Using two helix flaps rather than a single flap, the defect closure is achieved with a remarkably lesser tension and, consequently, minor risk of flap impairment or other postsurgical complications. Further experiences on larger series are necessary to support our procedural choice.

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