

Use of three rhomboid flaps for scalp defect coverage

Retalho romboide triplo para fechamento de defeitos em couro cabeludo

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ABSTRACT

Full-thickness scalp defects exposing the skull can be challenging for plastic surgeons. Scalp skin has low elasticity, so a large flap is necessary to cover even a small defect. This article presents 9 cases in which 3 rhomboid flaps were used for the closure of scalp defects. One patient experienced flap necrosis and required reoperation. Two other patients had minor complications treated with dressing. The method presented herein allows the harvest of 3 small flaps that collectively cover the defect as well as the primary closure of the donor area. This technique does not require the creation of a large flap or skin graft from the donor. Thus, the technique described herein is suitable for medium-thickness scalp defects and is a good alternative to large rotation flaps and skin grafts.

Keywords: Scalp/surgery. Scalp/injuries. Surgical flaps.

RESUMO

Defeitos no couro cabeludo podem ser um desafio para os cirurgiões plásticos quando afetam sua espessura total e deixam o crânio exposto. O couro cabeludo tem pouca elasticidade, assim um grande retalho é necessário para cobrir um defeito pequeno. O objetivo deste artigo é apresentar 9 casos em que 3 retalhos romboides foram utilizados para o fechamento de defeitos no couro cabeludo. Um paciente apresentou necrose do retalho e foi necessária reoperação. Dois outros pacientes tiveram complicações menores, que foram tratadas com curativos. O método apresentado permite a confecção de 3 pequenos retalhos que em conjunto cobrem o defeito, e as áreas doadoras são fechadas primariamente. Com a utilização da técnica descrita, a confecção de um retalho grande e a enxertia de pele da área doadora não são necessárias. Neste artigo é descrita uma técnica para fechamento de defeitos de tamanho moderado no couro cabeludo, que é uma boa alternativa a grandes retalhos de rotação ou enxerto de pele.

Descritores: Couro cabeludo/cirurgia. Couro cabeludo/lesões. Retalhos cirúrgicos.

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INTRODUCTION

Scalp defects affecting the full thickness of the scalp and/or exposing the skull can be challenging for plastic surgeons. Although a series of algorithms exists for the treatment of such defects^{1,2} that share the same principles, none are widely accepted by surgeons.

Small defects (< 2 or 10 cm² depending on the algorithm) can be primarily closed, whereas larger defects require more sophisticated closure techniques¹.

Cases involving medium defects (i.e., 2–25 or 10–50 cm²) usually require a local flap^{1,2}. Because of the low elasticity of the scalp skin, a large flap must be produced to cover even a small defect (Figure 1).

Larger defects must be reconstructed through a combination of axial flaps and free flaps or with the use of a skin graft^{1,2}.

Rhomboid flaps are very useful for defects on several body parts³. However, rhomboid flaps are not a viable option for the correction of scalp defects³, because it is impossible to primarily close the donor area; therefore, the donor graft would lead to a new defect without pilous follicles.

Here, we report 9 cases treated with a technique consisting of 3 rhomboid flaps for the closure of full-thickness scalp defects.

METHODS

The surgical technique described herein was performed on 9 patients; 2 illustrative cases are presented as examples.

Case 1

The patient was 73 years old and had a squamous cell carcinoma that was resected, resulting in a defect approximately 5 cm in diameter (Figure 2). The defect was divided into thirds with a “Y” mark with 120° angles. Three rhomboid flaps were demarcated and raised for the closure of the defect. The defect and flap donor areas were subsequently closed.

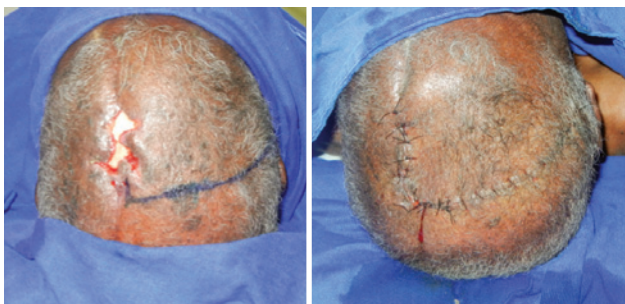


Figure 1 – Traditional flap.
A large flap is required to cover a small defect.

Case 3

The patient was 81 years old and had a 3.5 × 3.5-cm defect, formed after the resection of a scalp fibroxanthoma. Figure 3 shows the flap marking as well as the scalp appearance at 10 days and 2 months postoperatively.

One patient had flap necrosis and required reoperation. Two other patients had minor complications treated with dressing. Table 1 summarizes the patients' demographic data and complications. All patients were followed for at least 2 months.

DISCUSSION

Full-thickness scalp defects exposing the skull can have various etiologies including tumor resection, burns, electric or mechanical traumas, radiotherapy-induced necrosis, etc.^{1,2,5}.

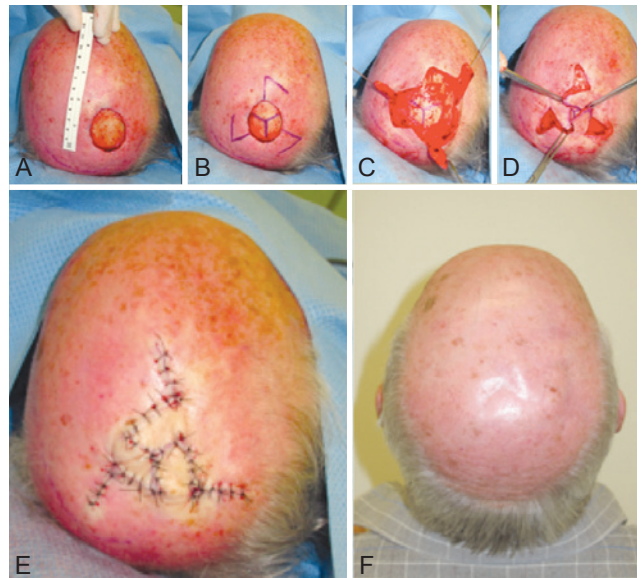


Figure 2 – Patient 1. In A, B, C, and D, intraoperative appearance of the correction of the scalp defect after resection of squamous cell carcinoma. In E, appearance immediately after surgery. In F, appearance 1 year postoperatively.



Figure 3 – Patient 3. In A, flap marking for the correction of a scalp defect following fibroxanthoma resection. In B, appearance 10 days postoperatively. In C, appearance 2 months postoperatively.

Table 1 – Demographic data of the patients and complications.

	Sex	Age (years)	Etiology	Size	Complication/treatment
1	M	73	Squamous cell carcinoma	5 × 5 cm	None
2	F	74	Necrosis following radiotherapy	1.5 × 1 cm	Complete necrosis/reoperation
3	M	81	Fibroxanthoma	3.5 × 3.5 cm	Small dehiscence/dressing
4	M	86	Squamous cell carcinoma	4 × 4 cm	Partial necrosis/dressing
5	M	37	Electric trauma	5 × 4 cm	None
6	M	73	Squamous cell carcinoma	4 × 4 cm	None
7	M	59	Squamous cell carcinoma	3 × 4 cm	None
8	M	69	Squamous cell carcinoma	5 × 5 cm	None
9	M	42	Pressure ulcer	4 × 4 cm	None

F = female; M = male.

Depending on their size, such defects can be treated with free flaps⁶, perforation or removal of the external layer for granulation and grafting⁷, or even with dermic substitutes⁸. Free flaps are associated with complex surgeries and consequently a risk of death. Furthermore, the wait for granulation and grafting can be weeks, and dermic substitutes are expensive. In addition, all of these closure methods induce alopecia in the reconstructed area. Therefore, local flaps are preferable⁹.

Moreover, the low elasticity of the tissue hardens the primary closure of the flap donor areas. Therefore, large rotation flaps or skin grafts should be considered.

The method described herein allows the elaboration of 3 smaller flaps that collectively cover the defect, allowing the primary closure of the donor areas. Demir et al.¹⁰ report a similar procedure using the V-Y-S technique.

This technique avoids the need to make a large flap and graft.

In conclusion, the technique described herein for closing medium scalp defects is a good alternative to large rotation flaps and skin grafts

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