INTRODUCTION

The scalp rotation flap is still the flap of choice for scalp defects as it provides hair-bearing skin, replacing “like with like,” and can be designed to respect hairlines and patterns. Conventionally, these flaps are planned to be up to 8 times the diameter of the defect to allow for sufficient recruitment of scalp laxity and allow for primary closure of the secondary defect. Nevertheless, its use is limited by large flap to defect ratios (See Video [online], which displays the surgical technique of the “snail flap”).

Following the creation of the scalp defect, the thickness of the scalp is measured. If it is less than 5 mm, a snail flap is raised, as shown in the video, with a “flap: defect” ratio of 2:1. The tip of the flap is folded onto itself and advanced into the primary defect first. The secondary defect is then closed by spreading the tension across the entire arc. In younger patients, where the scalp thickness tends to be greater than 5 mm and there is increased scalp laxity, a “flap: defect” ratio of 1.5:1 may be chosen as the greater scalp laxity accords ease of closure (Fig. 1).

DISCUSSION

Several local flaps can be safely utilized in scalp reconstruction providing “like with like” tissue in nonirradiated patients with moderate and large defects. In general, rotation flaps are more commonly chosen as they match the natural convexity of the scalp. A typical rotation flap as presented by Costa et al is presented in Figure 2. Tension-free closure, inclusion of a reliable vascular pedicle, and maintenance of anterior hairline, brow, and sideburn symmetry are critical aspects of the flap design. Types of described flaps include the “yin–yang” and “pinwheel” flaps for vertex defects or some more complex designs such as the “banana peel” flap for occipital defects and the “Juri” flap for anterior scalp defects.

Efforts to improve upon the efficiency of the scalp rotation flap have long been afoot. Ahuja designed a modified rotation flap by placing the isosceles triangle in an imaginary circle of tissue to gain more effective movement flap tissue into the defect. This involved raising a tongue of extra tissue on the leading edge of the flap (above the base of the isosceles triangle) and then discarding it before flap inset. Subsequent modifications of this particular technique involved utilizing this extra tongue of tissue to further fill in the defect. This modification allows tissue movement from an area almost diametrically opposite to the defect instead of shortening the line of maximum extensibility, a paradigm shift over conventional rotation flap philosophy. A similar concept was propounded, termed “the divine rotation flap” but a comparative study between all these designs above concluded that the conventional rotation flap design was superior based on the tension resulting after wound closure and calculating the length of the scar.

In this article, we challenge that notion and introduce an advanced technique without any related complicated mathematical type but inspired by the well-known golden spiral, which is abundant in nature. According to our practical experience, scalp thickness changes by age. Provided that one takes scalp thickness which represents the intrinsic scalp laxity into account and modifies flap: defect ratios as graphically illustrated in Figure 1, closure of both primary and secondary defects is seamless. This is a useful generic rule that must be evaluated in every case allowing larger scalp defects to be reconstructed without resorting to skin grafts or transposition flaps, which again require skin grafting of secondary defect. This is an ideal scalp reconstructive tool, especially in women and younger patients, with most reconstructions possible as an office procedure.

Our experience in the Queen Victoria Hospital (East Grinstead, UK) reiterates this conclusion. More specifically, we have used the “snail flap” for the reconstruction of scalp defects during a 2-year period in 18 patients (10 women and 8 men) with age ranging from 45 to 85

From the Department of Plastic Surgery, Queen Victoria Hospital, East Grinstead, UK.

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years and a postoperative follow-up from 5 to 12 months. Nineteen malignant skin lesions (13 basal cell carcinomas [BCC] and 6 squamous cell carcinomas [SCC]) have been initially excised leaving circular defects with a diameter up to 7.5 cm. The flap survival rate was 100% with minor complications including 2 incidents of minimal flap necrosis and 1 overgranulating scar. Alopecia was practically undetectable and confined just over the scar. Generally, the aesthetic outcome was deemed very satisfactory from the surgeon and the patient in all cases.

Limitations

One limitation of our study is that we cannot provide any experience of the flap use for other regions of the body except from scalp. Additionally, the video from the operating room is quite shaky in some instances and in the second case presented we could not provide a long-term follow-up image.

Georgios Christopoulos, MD, PhD, MSc
Plastic Surgery Department
Queen Victoria Hospital
NHS Trust
East Grinstead, UK
E-mail: gdchristopoulos@gmail.com

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