

CASE REPORT

Telogen Effluvium as a complication of scalp reconstruction with tissue expander: a case report

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Abstract.

Background and aim: The treatment of burn alopecia is still considered a challenging task for plastic surgeons. Tissue expansion has been extensively described as a useful technique used in order allow the reconstruction of large scalp defects with reliable hair-bearing tissue, enhancing the final aesthetic outcome. **Case Report:** We present the case of a 43-year-old woman affected by scarring burn alopecia of left parietal area, treated with staged tissue expansion and local flap reconstruction. Despite the complete flap survival, a reversible acute hair loss 12 days after surgery, ascribable as Telogen Effluvium (TE), was reported. **Conclusions:** TE is a rare and self-limiting condition potentially related with any kind surgery or stressful events. Plastic surgeons should be aware of this condition, particularly when performing scalp reconstruction, as it can be misled with other local complications. Clinical diagnosis is of paramount importance to avoid useless or even harmful treatments: reassuring the patient remains the most effective therapeutic pathway. (www.actabiomedica.it)

Key words: Telogen Effluvium, Burn Alopecia, Scalp Reconstruction

Introduction

Burns in the head and neck region are among the most common injuries seen in a Burn Care Unit, affecting up to 45% of patients (1). Among others, scalp burn poses unique reconstructive challenges as it is associated to burn alopecia. Tissue expansion has been described extensively as a reliable technique when addressing scalp reconstruction, with good functional results and low rate of complications (2). The skull acts as a rigid base for the expander while the overlying skin is particularly thick, vascularised and hair bearing, enabling a minimal scarring reconstruction with enhanced aesthetic outcome (3).

The Telogen Effluvium (TE) is the most frequent cause of diffuse acute hair loss and it is often related to stressful events (4). Despite relatively rare, TE can occur as a post-operative complication, regardless the location of the surgical site (5). Although particularly

inconvenient for the patient, this condition is generally benign and resolves spontaneously within weeks in the vast majority of cases. When it occurs after a scalp surgery however, it is crucial to perform a correct differential diagnosis in order to avoid unnecessary and even harmful treatments.

To the best of our knowledge, there are no case reported of TE after scalp's tissue expansion in present literature.

In this paper, and for the first time in literature, the authors present the case of a reversible TE observed after performing tissue expansion and cutaneous flap coverage of burn alopecia.

Case report

A 43-year-old woman presented at our Unit complaining about a 14 x 4 cm bald scarring area in the left

parietal region due to a burn injury and subsequent skin graft occurred 6 months earlier (Figure 1).

In order to restore the hair bearing area and minimise aesthetic sequelae and scarring, a circular tissue expander was placed in the subgaleal plane and progressively (in around 11 weeks) inflated with 550 cc of saline solution (Figure 2).

Four months after the first surgical step, the patient underwent surgical explant of the tissue expander,

asportation of the scarring alopecia, and coverage of the cutaneous defect with the expanded skin rotational flap. No early complications occurred. The patient was discharged 1 day after surgery. 2 weeks post-op, complete hair loss over the cutaneous flap was seen (Figure 3).

The tricolological examination of the scalp showed complete integrity and vitality of hair follicles, a TE was therefore diagnosed. Without need for any treatment, hair started regrown spontaneously. At 3 months



Figure 1. 14 cm x 4 cm burn alopecia in left parietal area.



Figure 3: Telogen Effluvium of cutaneous flap.



Figure 2. Full Expansion with 550 cc of saline solution.



Figure 4. Complete hair restoration.

follow-up, no residual alopecia was seen (Figure 4) and the patient was highly satisfied with the aesthetic outcome.

Discussion

Particularly in women, hair is important for a healthy appearance and social interactions. Scalp scarring with related alopecia is a well-known cause of distorted self-image and low self-esteem, which can ultimately lead to anxiety and depression (6). For these reasons it is crucial for the reconstructive surgeon to recreate a scalp as natural as possible.

When addressing burn wounds of second and third degree, skin grafts are usually considered the best surgical option, unless bone, tendons or joint need to be covered (3).

Skin grafting in the scalp, however, has a limited role because of lack of durability and poor cosmesis, especially in areas of hair-bearing. Local fasciocutaneous flaps (advancement, rotation or transposition) are a good option for small to medium size defects (up to 50 cm²).

For larger defect, tissue expansion is an important tool as it allows to recruitment of hair bearing scalp and provides an ideal match to the thickness, texture, and color of nearby skin.

Implant exposure or deflation, neuropraxia and infection are considered among the most frequent complications occurring when performing scalp reconstruction with tissue expander; however, their incidence is low when the proper surgical technique is used (7).

Acute telogen effluvium (acute reversible hair loss) is a quiet rare complication of any kind of surgery, but it has never been reported as a complication of scalp's tissue expansion (8). After a stressful experience, such as a surgical procedure, a large numbers of hair follicles can suddenly change their phase of growth. The chemical causes of this shift are still unknown. Anagen, the active growing phase, is abruptly halted, and the follicles enter in telogen (the resting phase). Quantity of hair in telogen phase during telogen effluvium is doubled compared to normal condition. The result of this shift is an acute loss of a large amount of hair

(8). Chronic telogen effluvium is very uncommon and almost all patients report hair regrowth within weeks or months.

Diagnosis is mostly clinical by pull test positivity (at least four hairs removed with a gentle pull), identification of sudden hair loss and a precipitating factor (5)

Performing extensive testing, including skin biopsies or plucking hair for examination, is not mandatory to make the diagnosis of telogen effluvium, but can be useful in doubtful cases.

In our case, it is unclear if a trigger role has been played by the high speed of expansion (55 ml/week) or the large quantity of final volume inflation (550 cc). In fact, while some authors (9-10) suggest that mechanical stretch and tissue expansion can have a beneficial effect on hair regrowth, Chu et al. described that mechanical stress can cause the accumulation of unfolded proteins in the endoplasmic reticulum (ER), which can ultimately lead the cell to activate the apoptosis process (11). However, to date, neither of these factors have been associated to the onset of acute alopecia.

When facing TE after scalp reconstruction it is crucial to make a correct diagnosis as post-operative alopecia could be mistaken for a local complication and unnecessary treatments can be started. Most insidious differential diagnosis is alopecia areata. In fact, alopecia areata therapy includes high dosage of corticosteroids, either topical or injected or even systemic. These therapies are associated to an increased rate of infection and delayed healing (12) that could ultimately compromise the aesthetic result and increase patient discomfort. Furthermore, confusing telogen effluvium with a chronic condition could lead surgeon to perform aesthetic restoration surgery as hair transplant (13).

Other differential diagnosis includes: scarring alopecia, syphilis and trichotillomania (14-15).

Despite no effective treatments are described for TE, the process is usually self-limiting and restitutio ad integrum is common. Patients should be reassured and educated to use of a mild shampoo without sodium lauryl sulfate and implement a balance diet with all nutritional requirements. If required, amino acids, vitamin B complex, zinc, and proteins may be prescribed (14).

Conclusion

Telogen effluvium could occur after any surgical procedure. The specific cause of telogen effluvium has not yet been elucidated. Plastic surgeons should be aware of this condition, particularly when performing scalp reconstruction, as it can be mislabeled with other local complications. Clinical diagnosis is of paramount importance to avoid useless investigations and treatments: reassuring the patient remains the most effective therapeutic pathway.

Conflicts of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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