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In vivo parallel relaxing incisions for scalp defect repairs

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To the Editor

Scalp defects are challenging to repair because of increased tissue thickness, fibrous underlying galea, and convex shape, which causes tissue inelasticity and increased wound tension.¹ Though small scalp defects may be closed linearly, moderate to large defects may require significant tissue undermining and large flaps or grafts to achieve tissue closure. Additionally, postoperative pain and dehiscence from wound tension may occur in patients who undergo scalp defect repairs.²

Herein, a solution is presented that provides immediate and delayed benefits by reducing tension for scalp wounds. With this methodology a #15 blade scalpel is used to create small full thickness incisions (approximately one-third the length of the primary surgical defect) and are incised at the center point of the defect, where the tension is highest, to create small crescentic shaped secondary defects. Thereafter, the tissue adjacent to both the primary and secondary defects is undermined along the subgaleal plane. Finally, the primary and secondary surgical defects are closed with a combination of dermal and epidermal sutures (**Figure 1A-B**).

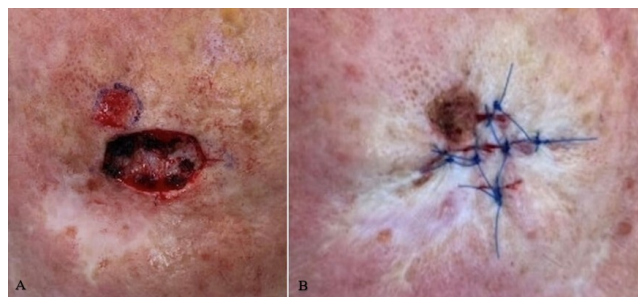


Figure 1. A) 1.5x2.5cm defect on the vertex scalp, and adjacent actinic keratosis and curvilinear hypopigmented scar. **B)** Surgical defect and bilateral parallel relaxing incisions of the vertex scalp closed with 3-0 PDS dermal sutures and 3-0 prolene epidermal sutures and adjacent superficial electrodesiccation and curettage wound.

In this fashion, wound tension is reduced via redistribution of primary tension vectors and creation of secondary tension vectors to facilitate closure of both surgical defects respectively (**Figure 2A-B**). Thus, this technique immediately reduces wound tension and improves closure. Additionally, it decreases discomfort related to feelings of tightness, speeds wound healing through tension reduction and decreases risk of dehiscence or scar spread. Furthermore, the number and size of incisions may be customized to the shape and tension vectors of primary surgical defects. Relaxing incisions have been utilized in alternative surgical procedures including lower extremity repairs following orthopedic surgery and in skin flap lengthening (in conjunction with galeotomies, which

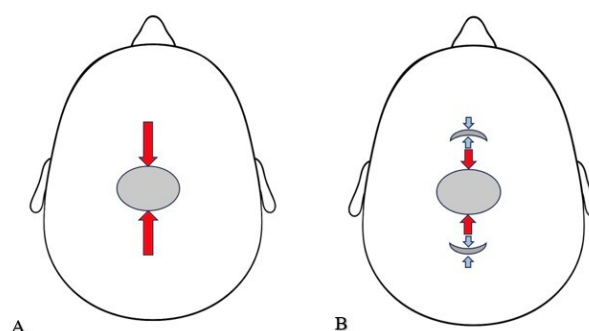


Figure 2. A) Primary surgical defect and primary tension vectors. The gray circle represents the primary surgical defect. Red arrows represent the primary tension vectors used to close the primary surgical defect. **B)** Primary and secondary surgical defects and primary and secondary tension vectors. The primary tension vectors are smaller because the tension is redistributed to the secondary defects. The gray crescents represent the secondary surgical defects created from parallel relaxing incisions. The red arrows represent the primary tension vectors used to close the primary surgical defect. The blue arrows represent the secondary tension vectors used to close secondary surgical defects.

function similarly to reduce wound tension) following plastic surgery on the scalp.³⁻⁵ In addition, they have been useful in lacrimal bypass procedures in ophthalmic surgery to facilitate wound closure in a similar fashion.⁶ To the authors' knowledge, parallel relaxing incisions have not been described for scalp defect repairs or in Mohs surgery settings. Thus, this technique provides a

novel and efficacious solution for reducing wound tension for scalp defects following Mohs surgery.

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Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Robinson JK, William Hanke C, Siegel D, et al. Anatomy for Procedural Dermatology. In: *Surgery of the Skin Procedural Dermatology*. 3rd ed. Elsevier Saunders; 2015:1-27. doi:[10.1016/B978-0-323-06575-7.00001-8](https://doi.org/10.1016/B978-0-323-06575-7.00001-8)
2. Hoffmann JF. Management of scalp defects. *Otolaryngol Clin North Am*. 2001;34:571-582. doi:[10.1016/S0030-6665\(05\)70006-2](https://doi.org/10.1016/S0030-6665(05)70006-2). PMID:11447003
3. Paul SP. Biodynamic Excisional Skin Tension Lines for Excisional Surgery of the Lower Limb and the Technique of Using Parallel Relaxing Incisions to Further Reduce Wound Tension. *Plast Reconstr Surg Glob Open*. 2017;5(12):e1614. doi:[10.1097/GOX.0000000000001614](https://doi.org/10.1097/GOX.0000000000001614). PMID:29632788
4. DiStasio AJ 2nd, Dugdale TW, Deafenbaugh MK. Multiple relaxing skin incisions in orthopaedic lower extremity trauma. *J Orthop Trauma*. 1993;7(3):270-274. doi:[10.1097/00005131-199306000-00012](https://doi.org/10.1097/00005131-199306000-00012). PMID:8326433
5. Raposio E, Santi P, Nordström RE. Effects of galeotomies on scalp flaps. *Ann Plast Surg*. 1998;41(1):17-21. doi:[10.1097/0000637-199807000-00004](https://doi.org/10.1097/0000637-199807000-00004). PMID:9678463
6. Dortzbach R, Woog JJ. Small-incision techniques in ophthalmic plastic surgery. *Ophthalmic Surg*. 1990;21(9):615-622. doi:[10.3928/1542-8877-19900901-04](https://doi.org/10.3928/1542-8877-19900901-04). PMID:2250867