Patch and pulley: A simple and cost-effective approach to surgical management of large scalp defects

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Key words: biological dressings; Mohs surgery; scalp; wound healing.

CHALLENGE

Reconstruction of large scalp defects is complicated by limited scalp laxity, terminal hair growth, and a poorly accessible location for wound care. The scalp is also a high-risk site for tumor development[1] often complicated by field cancerization with residual scarring from prior surgeries. These factors restrict surgical repair options.

Reconstructive flaps and skin grafts can be surgically complex and time intensive. They pose risks of infection, bleeding, and flap necrosis, while also limiting the ability to clinically monitor for tumor recurrence. Second intention healing alone can create a prolonged wound care burden, while risking desiccation and osteomyelitis if calvarium is exposed. Tissue expanders, synthetic dermal regeneration templates, and amniotic membrane layers have been described but carry high material costs.[2] Products formulated with growth factors pose a theoretical oncologic risk of promoting tumorigenesis.

SOLUTION

With these challenges in mind, we present the Patch and Pulley technique as a simplified method using a collagen xenograft "patch" and pulley sutures (Figs 1 and 2). This approach avoids complex repairs and cost-effectively reduces healing time.

The wound bed is first layered with a 100% bovine collagen xenograft "patch." Puracol Plus Ag+ (Medline Industries, LP) is a particularly cost-effective option priced under $7 per 2 × 2.5-inch sheet. The template is cut to size, folded to double thickness, and secured with absorbable tacking sutures.

Deep interrupted pulley sutures (absorbable 2-0 or 3-0 braided polyglactin 910) are then placed to partially guide the wound edges. An optional running absorbable suture can secure the xenograft. Standard wound care is recommended with white petrolatum and nonstick gauze.

The ideal patient has a medium to large scalp defect whose size precludes primary closure. Repair with a flap or graft may be undesirable due to prior surgical scarring, field cancerization, patient comorbidities, or a high-risk tumor in which flap repair may restrict clinical surveillance.

In summary, the Patch and Pulley technique is a desirable method for managing large postsurgical scalp defects following Mohs surgery. This simple approach avoids the morbidity and failure risks of large complex flaps, reduces wound healing time of second intention healing without extending wound care burden to the patient, and cost-effectively allows for improved tumor surveillance while avoiding multiple follow-ups of staged procedures and maintaining a favorable cosmetic outcome.

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Funding sources: None.

IRB approval status: Not applicable.

Patient consent: Consent for publication of photographs is obtained. Available upon request.

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JAAD Int 2023;12:177-8.

2666-3287

https://doi.org/10.1016/j.jdin.2023.06.006

Fig 1. The Patch and Pulley technique, shown with intact patch beneath 4 interrupted pulley sutures of 2-0 braided polyglactin 910 in a 76-year-old male. Original scalp defect measured 10.5 × 7.0 cm with exposed calvarium following 2 stages of Mohs micrographic surgery for a recurrent squamous cell carcinoma. Note: a portion of the case used a human biologic dermal graft, Flex HD (MTF Biologics), prior to switching to the recommended Puracol Plus Ag + collagen dressing (Medline Industries, LP) as a superior "patch." Human biologic dermal grafts are no longer used by the authors due to increased costs and necessity of debridement after the graft invariably becomes necrotic.

Fig 2. Complete re-epithelialization was achieved within 6 months following surgery.

Conflicts of interest

None disclosed.

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