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CASE REPORT
Reconstructive

Use of Viable Cryopreserved Placental Membrane as an Adjunct to Facial Keloid Resection

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Summary: Keloids are the physical manifestation of an exaggerated inflammatory response resulting in excess collagen deposition. The resulting fibroproliferative mass can be distressing for patients due to appearance, pruritus, and/or pain. Despite extensive research into the pathophysiology of keloid formation and the development of numerous treatments, keloids remain a challenge to treat. Even when the initial treatment is successful, a risk of recurrence remains. Basic science research into viable cryopreserved placental membranes and viable cryopreserved umbilical tissue has demonstrated their anti-inflammatory and anti-fibrotic effects, which may decrease keloid recurrence after excision. In this article, we present the first-reported case of viable cryopreserved placental membrane, with living mesenchymal stem cells, to treat a painful preauricular keloid in conjunction with surgical resection. *(Plast Reconstr Surg Glob Open 2018;6:e1638; doi: 10.1097/GOX.0000000000001638; Published online 11 January 2018.)*

INTRODUCTION

Normal wound healing proceeds through a well-defined cascade of hemostasis, inflammation, proliferation, and maturation phases that are characterized by complex cellular interactions and cytokine signaling pathways. Keloids occur due to dysregulation of fibroblast activity during the inflammatory phase, resulting in excess collagen deposition extending beyond the boundaries of the original wound.[1,2] Treatments targeting fibroblasts and downregulating inflammation—including steroids, radiation, and interferon—make up the majority of interventions for pathological scarring.[2–4]

Although surgical resection of the keloid removes scar tissue, surgery also triggers an inflammatory response, thus increasing risk of keloid recurrence. For that reason, surgery may be paired with anti-inflammatory agents, such as a series of postoperative steroid injections or irradiation. However, these modalities carry side effects that can be severe and systemic.[1]

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Viable cryopreserved placental membrane (vCPM) retains all components and properties of fresh tissue, including anti-inflammatory, anti-fibrotic, and pro-angiogenic effects via paracrine signaling.[5–8] These make vCPM a potential surgical adjunct in prevention of scar formation in keloid-prone patients. In this article, we present a case of a keloid successfully managed with resection and vCPM implantation before surgical wound closure.

CASE REPORT

The patient is a 62-year-old male with bilateral temporomandibular (TMJ) disorder, posttraumatic stress disorder, hypertension, and tobacco use who underwent bilateral TMJ arthroplasty. The arthroplasties were performed sequentially without complication. The patient subsequently returned to clinic with complaints of pain and discomfort along his left preauricular incision where a keloid had formed (Fig. 1). All other incisions had healed normally.

Twenty-one months after his left-sided TMJ arthroplasty, the patient underwent surgical resection of the keloid. An elliptical incision was made around the keloid with a #15 scalpel, with the deep portion of the scar removed sharply. The surgeon undermined surrounding skin with facelift scissors until the tissue could be approximated without tension. A strip of vCPM was then placed in the base of the wound (Fig. 2). The tissue was closed with a 4-0 absorbable monofilament in the deep dermis and a running continuous 5-0 nylon skin closure (Fig. 3). Dressing included bacitracin, nonadherent barrier, and Tegaderm.

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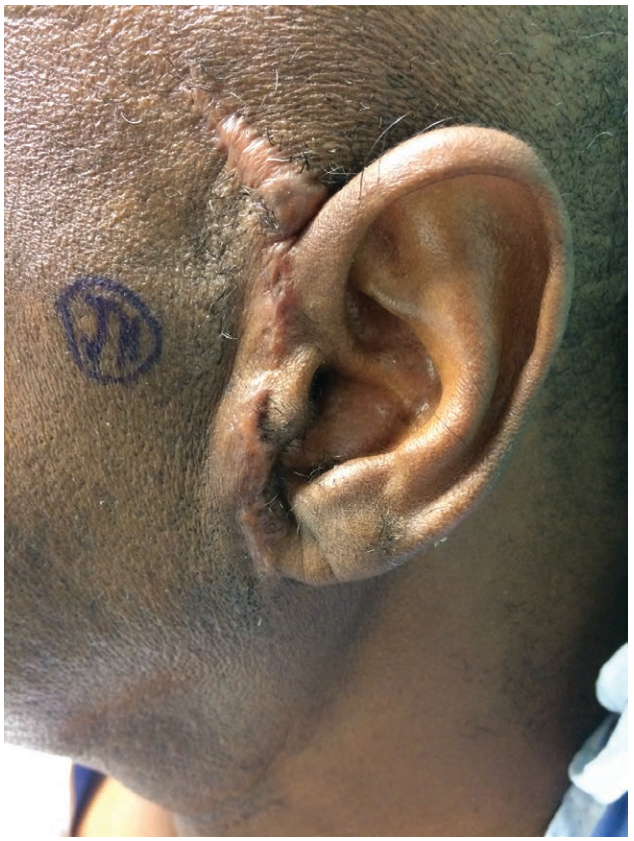

Fig. 1. Left preauricular keloid.

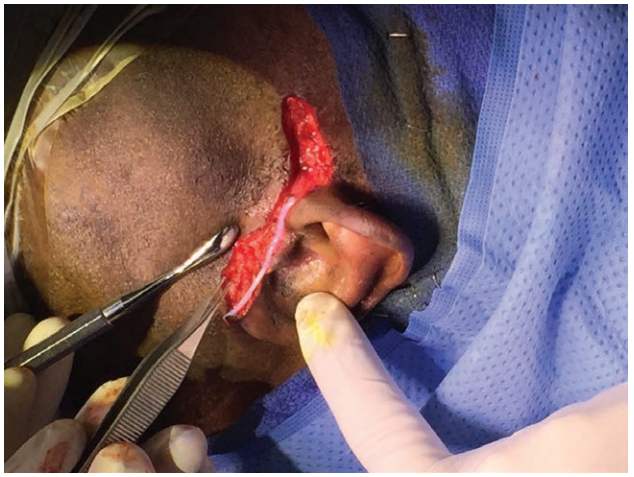

Fig. 2. vCPM in wound bed after resection of scar tissue.

At follow-up 4 weeks later, the incision was clean, dry, and intact with no erythema or induration (Fig. 4). No keloid reformation occurred on subsequent 4- and 9-month follow-ups, at which point the scar was minimally visible and the patient pleased with the aesthetic results.

DISCUSSION

Pathological scars remain a challenge despite numerous treatment modalities.[2,3,9,10] One reason is the complexity of the pathomechanism for which there is no animal model, limiting our ability to study effects of treatments.[2,3,11] There are also few robust clinical studies assessing interventions. As a result, individual clinical experience has driven care.

First-line treatment in the United States is typically corticosteroids, which matches international expert guidelines.[10–12] Monotherapy is often inadequate, however. Reported recurrence rates with steroids alone range from 9% to 50% but were found to decrease to 14.3% when combined with surgical resection.[3,13] Similarly, improved results with multimodal therapy were found combining surgery and irradiation, steroids and fluorouracil (5-FU), and so on.[1,3,10,11,14,15] Of note, many of these protocols require repeated interventions, such as monthly injections of steroids or botulinum toxin.[1,11]

Ongoing research into the inflammatory mechanisms of keloid formation and clinical treatments has yet to find a durable solution. Within the literature and practice, there is an ongoing search for novel therapies with the hope of decreasing recurrence rates and ultimately preventing initial formation of keloids.

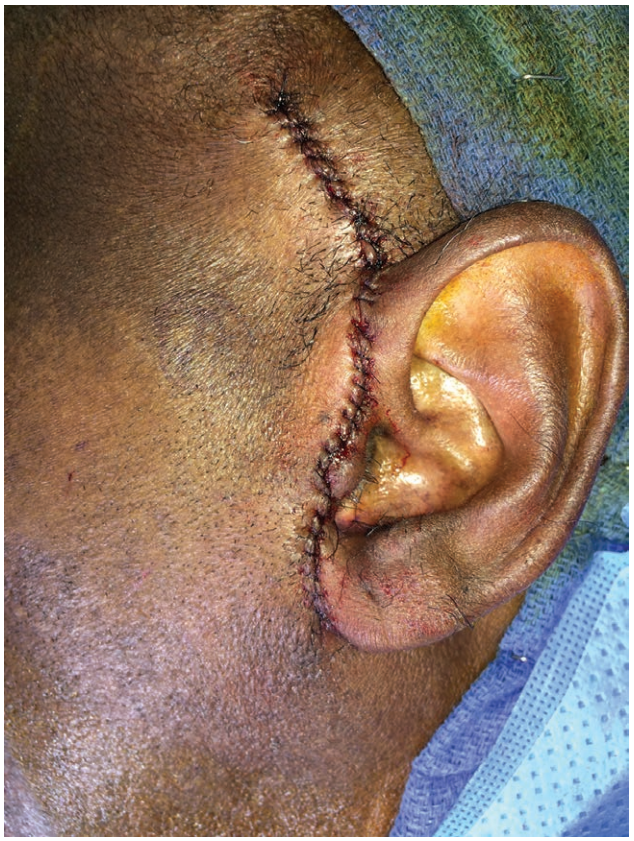

Fig. 3. Layered closure with running 5-0 nylon suture.

CONCLUSIONS

This case report is a proof of concept for use of vCPM in the treatment of fibroproliferative scar formation in conjunction with surgery. Though findings are limited as

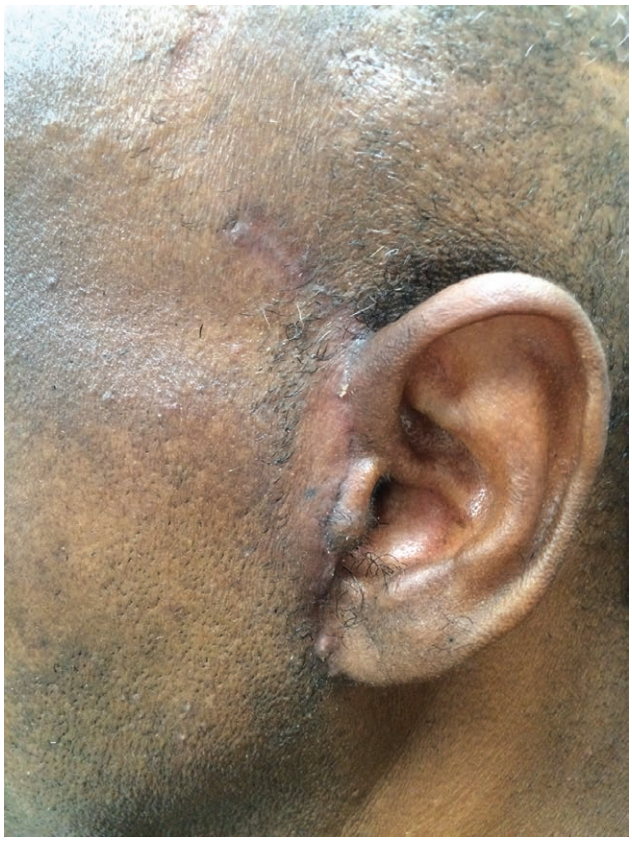

Fig. 4. Healed wound at 4 weeks postoperatively.

a case study, this novel approach is promising, and further clinical research is warranted.

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