

## A Novel use of Dermis Fat Graft for the Repair of an Exposed Scleral Buckle

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### Abstract

In this retrospective, interventional case report of a 40 year-old woman with Stickler Syndrome, we present a novel use of dermis fat graft to manage an externally exposed scleral buckle that was refractory to other methods of management. Dermis fat graft is a relatively robust material that can be effectively utilized to rescue an exposed scleral buckle. This case presentation conforms to the tenets of the Declaration of Helsinki and is Health Insurance Portability and Accountability Act compliant. This single patient case report was institutional review board exempt as it does not meet the definition of human subjects' research.

**Keywords:** Scleral buckle; Stickler syndrome; Dermis fat graft; Retinal detachment

### Summary

We describe a novel use of dermis fat graft to successfully manage a repeatedly exposed scleral buckle that was refractory to conventional management in a woman with Stickler Syndrome.

### Introduction

Although rare, the exposure of a scleral buckle (SB) used to repair rhegmatogenous retinal detachment can lead to complications ranging from irritation and discomfort to sight and eye threatening infection [1]. While a clinically infected SB requires removal, an uninfected SB can be salvaged to circumvent the possibility of a recurrent retinal detachment associated with SB removal. Small exposures may be managed with long-term antibiotic therapy with or without conjunctivoplasty. For larger exposures and cases where conjunctival scarring precludes an effective tension-free closure, various materials have been used to repair the exposure site, including autogenous fascial grafts, pericardial patch grafts, scleral patch grafts, and scleral patch grafts underlying an amniotic membrane or labial mucosal graft [2-5]. We describe a novel method utilizing autologous dermis fat graft to successfully repair an exposed and clinically uninfected SB. To the best of our knowledge after a comprehensive review of the literature, this method has not been previously reported for management of an exposed SB.

### Case Report

A 40 year old woman with Stickler Syndrome and a history of multiple bilateral retinal detachment repairs presented with an inferonasal retinal detachment in the right eye just outside the inferior arcade one month after an infected SB removal in that same eye. Her visual acuity was 20/25 in the right eye and no light perception vision in the left eye. The patient underwent retinal detachment repair by way of pars plana vitrectomy, scleral buckling (4050 band, 72 sleeve tied inferonasally), perfluorocarbon liquid, laser photocoagulation, fluid gas exchange, and silicone oil placement. Replacement of the SB was deemed necessary given her history of re-detachment after SB

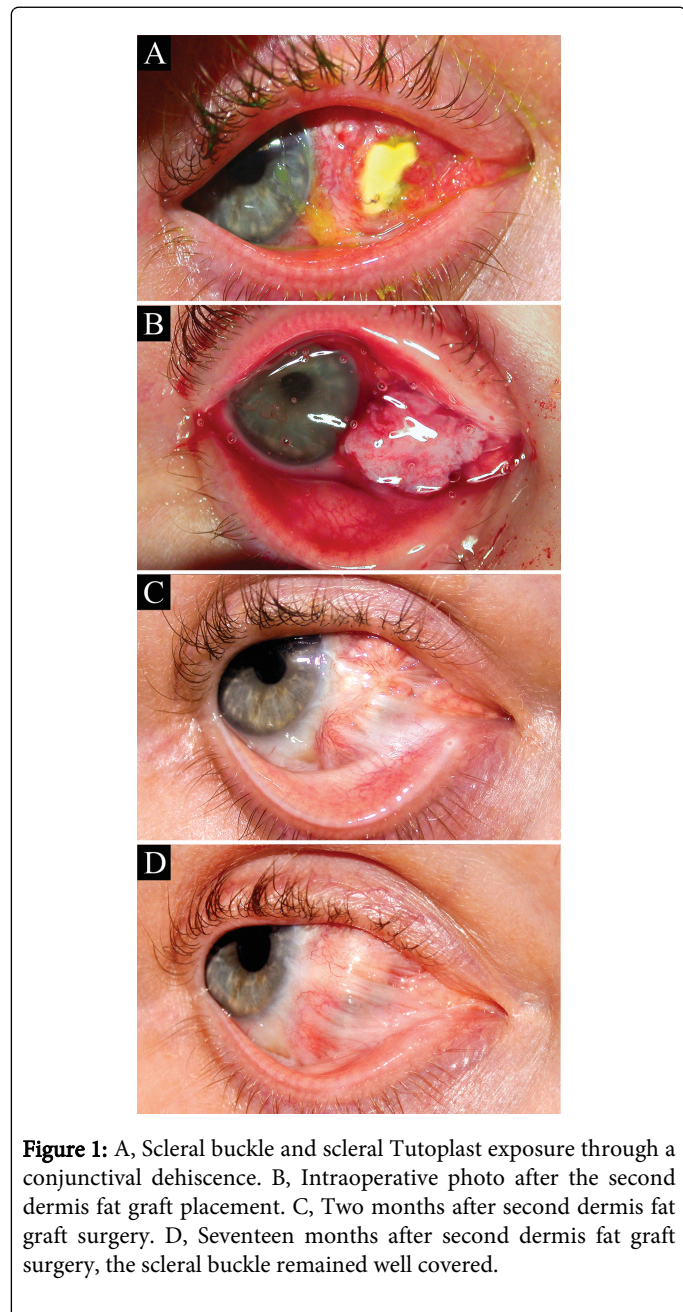
removal in the setting of Stickler Syndrome. Twelve days after surgery, however, the SB sleeve and the inferonasal aspect of the band were found to be exposed. She was continued on post-operative topical antibiotic and steroid drops.

Three weeks following the discovery of SB exposure, a conjunctival autograft from the same eye along with an amniotic membrane graft were used to repair the exposure. It was noted at the time of this surgery and at subsequent surgeries that the inferonasal bulbar and forniceal conjunctiva was deficient and scarred down with minimal mobility as a result of multiple previous surgeries. Eight days after this repair, the SB re-exposed. This time, a processed human donor pericardial patch graft (Tutoplast) was placed, which again resulted in a third exposure 12 days later where the SB eroded through the middle of the Tutoplast (Figure 1A). One week after the third exposure, a processed human donor scleral patch graft was placed but this resulted in dehiscence of the inferior suture line and re-exposure of the SB five days later.

Nine days after the fourth exposure (nearly eleven weeks after the repeat SB placement), a dermis fat graft (DFG) from the lower anterior abdominal wall was harvested and thinned. The DFG was sutured into place with interrupted 8-0 nylon sutures at the cardinal positions and running 7-0 Vicryl suture in the periphery, overlapping the recipient conjunctival edge over the peripheral dermal edge of the DFG to encourage epithelialization of the DFG. The DFG conjunctivalized by one month and provided good coverage of the SB. Eight weeks later, the patient underwent silicone oil removal via a temporal peritomy and sclerotomy, being careful not to disturb the DFG inferonasally. However, re-exposure occurred 11 days later and a scleral Tutoplast patch graft was placed under the conjunctival/dermal edges of the exposed area. Unfortunately, the scleral Tutoplast and SB re-exposed through a conjunctival dehiscence nine days later.

One week following the latest exposure (nearly 23 weeks after the SB placement), a second DFG was attempted. This time, a larger graft with a thicker layer of fat was harvested from the lower anterior abdominal wall and secured over the exposed SB element by placing two separate 6-0 Vicryl sutures in a horizontal mattress fashion to allow tension-free closure, incorporating the SB element with each suture and securing it to the central thickest portion of the DFG. In addition, three 6-0 Vicryl horizontal mattress sutures were placed

superiorly, inferiorly and nasally so the recipient conjunctival edges overlapped on top of the dermal edge of the DFG to encourage epithelialization. Finally, a running 7-0 Vicryl suture was placed around the edge of the DFG so that the conjunctival edge would overlap on top of the dermal edge of the DFG (Figure 1B).



Post-operatively, this thicker and bulkier DFG created a convex dome configuration from the plane of the sclera and cornea, causing dellenoid changes in the adjacent inferonasal perilimbal cornea. This was effectively managed with aggressive topical lubrication with artificial tears and ointment until the DFG flattened out as the underlying fat layer atrophied. The graft conjunctivalized completely at three weeks after surgery (Figure 1C).

Even over seventeen months after placement of the second DFG, the SB remained well covered (Figure 1D). The DFG flattened out with complete resolution of the dellenoid changes in the adjacent cornea.

## Discussion

SB removal leads to retinal re-detachment in 8-14.5% of patients, especially when done within six months of SB placement [6,7]. Risk factors include a history of multiple retinal detachments, persistent vitreoretinal traction, proliferative vitreoretinopathy, aphakia with multiple posterior breaks, exposures with retina attached for a short duration, and lack of detecting retinal holes/tears at the time of the original RD repair [6-8]. In our monocular patient with Stickler Syndrome contributing to multiple retinal detachments and a recent SB placement of less than six months, there would have been high risk of retinal re-detachment upon SB removal. Therefore, repairing the defect with a graft became the safer choice. Despite the literature's encouraging reports of successfully using various autologous and allogeneic grafts to repair exposed SBs, our patient encountered multiple graft failures, ultimately requiring a second thicker and larger dermis fat graft to achieve long-term coverage. Although dermis fat grafting stands as a novel technique for SB repair, it has long been used in the oculoplastics field in the repair of exposed orbital implants, socket reconstruction after enucleation, superior sulcus augmentations, and repair of enophthalmos [9]. Autologous DFG not only bypasses the risks of disease transmission and immunologic rejection, but is thought to provide comfort and promote rapid wound healing. In addition, its robust nature reduces the risk of wound breakdown, desquamation and fistula formation. A disadvantage is the need of a donor surgical site which may lead to increased morbidity.

In our patient, numerous risk factors contributed to grafting failure and SB re-exposure. The first is poor epithelialization over donor material. Our patient carried numerous risk factors that could interfere with the integrity of the ocular surface, thus compromising the epithelialization process. These potential factors included a history of glaucoma, chronic use of topical brimonidine eye drops, collagenopathy from Stickler Syndrome, decreased wound healing from topical steroids, mechanical effect from the SB element itself, multiple past ocular surgeries including previous cataract extraction and retinal surgeries, concurrent pars plana vitrectomy, and subsequent ocular procedures. Secondly, immunologic rejection may explain the mechanism of graft failure in the allogeneic grafts used in this patient. Additionally, our initial DFG may have simply been too thin and small. Fat atrophy of the thinner DFG may have led to further thinning resulting in SB re-exposure and may explain why the second, thicker DFG survived. If this technique is used, a generous size DFG with a relatively thick fat layer should be used, anticipating some postoperative fat atrophy. Care should be taken to suture the graft to allow for a tension free closure and to overlap the dermal and conjunctival edges to promote epithelialization. Finally, a subclinical infection may have been present; however, a culture of the SB was not obtained prior to the repair attempts.

In conclusion, DFG is a relatively robust material that can be successfully used to salvage an exposed SB, thus obviating the removal of an exposed SB and avoiding the increased risk of recurrent RD associated with SB removal in select patients.

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## Funding

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