

Treatment of Intractable Orbital Implant Exposure with Scleral Melting By Secondary Implant of Dermis Fat Graft-A Case Report

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Received date: January 30, 2017; Accepted date: February 24, 2017; Published date: February 28, 2017

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Abstract

A 30 year old female with absolute glaucoma status post-evisceration developed recurrent orbital implant exposure and scleral melting. We successfully treated the large conjunctiva defect by utilizing secondary implant of dermis fat graft for tissue growth and tension-free conjunctiva closure. The patient was satisfied with the postoperative outcome, and no major complications were observed in the following six months. Age and underlying disease may both be associated with dermis fat graft properties. Our case demonstrates that secondary dermis fat implantation is an effective method for treatment of exposed orbital implants and empty sockets after extrusion of an orbital implant.

Keywords: Orbital implant exposure; Scleral melting; Dermis fat graft

Introduction

The postoperative complications of enucleation or evisceration using orbital implant include wound infection, exposure, or peg extrusion [1]. Exposure rates ranging from 2 to 10% have been reported [2]. When the exposure area is small or the infection sign is mild, observation, topical medication, or direct closure can be attempted. However, when a large conjunctiva defect or severe infection present, autologous or preserved dermis grafts are usually performed [3,4]. The dermis fat graft has been advocated to serve as a primary or secondary ophthalmic implant despite the use of allograft orbital prosthesis to reconstruct the volume deficit cosmetically and functionally following enucleation. The utilization of dermis fat graft offers a dermis portion with adjacent subcutaneous fat that is suitable for the tissue growth, spontaneous re-epithelialization, and a satisfactory tension-free conjunctiva closure. Sufficient vascularization and a reduced risk of fat atrophy both facilitate its role as a secondary implant following exposure of a prosthesis. Here, we report a case of a female patient who developed exposure of the primary implant with scleral melting which was treated using a secondary dermis fat graft implant and was followed up for 6 months.

Case Report

The patient was a 30 year old female without systemic disease who had no notable family history of major health problems. She suffered from congenital glaucoma and received trabeculectomy of both eyes.

Penetrating keratoplasty of both eyes was performed one year later due to corneal edema and bullous keratopathy. However, absolute glaucoma of the right eye was noted two years later during follow-up and she subsequently received evisceration of right eye with orbital implant seven years ago. Progressive painful sensation with irritation of the right eye occurred and she presented to our hospital with protruding and exposed ocular prosthesis. Replacement of the orbital prosthesis was necessary to prevent infection. During this hospital admission, her visual acuity was no light perception in the right eye, 6/120 in the left eye. The previous implanted silicon prosthesis fell out of the orbit during the examination of the right eye. A large conjunctival defect, scleral melting, and eyeball deformation were noted (Figure 1A). Given the atrophy of the remaining sclera and volume insufficiency, treatment with removal of the ocular content and secondary implant of dermis fat graft was attempted. One autologous dermis fat graft (20 mm × 20 mm in diameter and thickness) (Figure 1B) was designed and harvested from the right gluteal region. The epidermis portion was dissected and separated. The recipient site was prepared by removal of the ocular content, and the adhesion tissue of the conjunctiva, sclera, and extraocular muscles were identified. The dermis fat graft was implanted in the enucleated socket (Figures 1C and 1D). The edge of the dermis fat graft was fixed into the Tenon's capsule with attachment to the extraocular muscles. Tension-free closure of the residual conjunctiva using 6-0 vicryl was performed. No infection signs, graft necrosis, or implant exposure were observed postoperatively. The dermis fat graft had fully re-epithelialized by the 1 month follow-up. The motility and cosmetic appearance were satisfactory at the six-month follow-up.

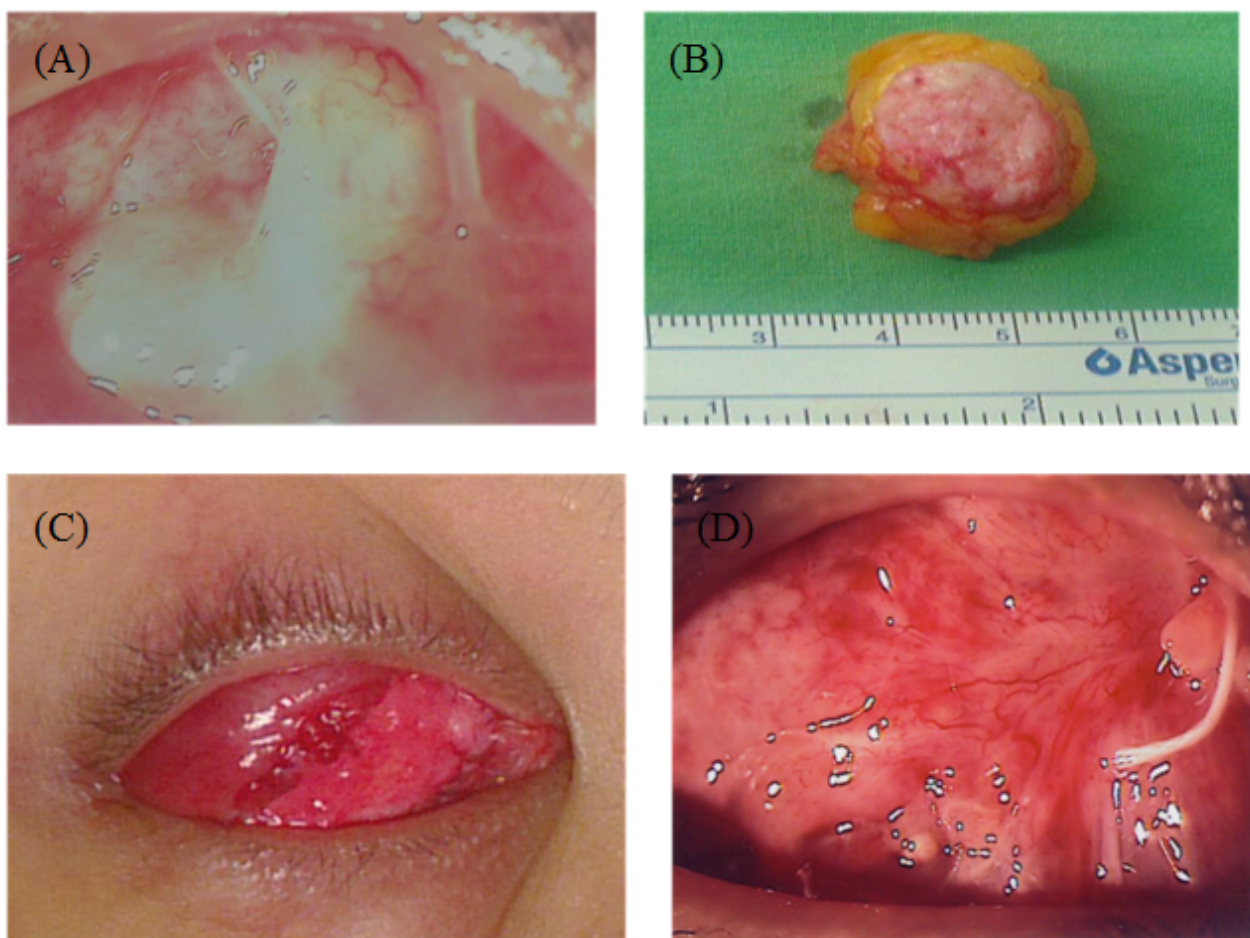


Figure 1: (A) Scleral melting and eyeball deformation. (B) Dermis fat (2 × 2 cm) graft from right gluteal region. (C) The dermis fat graft was implanted in the enucleated socket. (D) No graft necrosis or implant exposure was observed at the 6-month follow-up.

Discussion

This case successfully demonstrated that the use of a secondary implant dermis graft is safe and effective for facilitating orbital rehabilitation without complications.

Evisceration or enucleation has long been used to treat ocular disease. At present, it is standard practice to place a porous orbital implant in the socket after the globe has been removed to address this loss. The major drawback of porous orbital implants is their rough surface which leads to friction and inflammation, promoting breakdown and erosion of the overlying tissue, and subsequently anterior exposure and even infection may manifest. The poor vascular supply also results in late exposure. Since the majority of exposures do not heal spontaneously, early repair of porous implant exposures with autogenous or donor tissue grafts underneath vascularized conjunctival flaps is recommended [5]. Although persistent porous implant exposures can be surgically repaired, large or recurrent exposures may eventually require implant removal.

The potential of dermis fat graft for use in reconstruction of an anophthalmic socket was first described by Smith and Petrelli in 1978

[2]. Dermis fat grafts have also been used as a secondary implant following exposure or extrusion of alloplastic implants [6]. Besides the relative abundance and light weight of dermis fat grafts, they can also be larger without inducing tension in the fornix [7]. Autologous transplants reduce the risk of a host immunologic response against the graft, which improves the likelihood of success.

One of the major postoperative complications is spontaneous atrophy, which may occur in 6% of cases according to a retrospective study conducted by Nentwich et al. [8]. Necrosis or atrophy of the implant is more often seen after secondary dermis fat graft than after primary implant, particularly following chemical injuries, which may be due to reduced vascularization or alterations of the orbital tissue at the time of the revision surgery. Moreover, previous studies indicate that graft atrophy is usually seen in older patients. In contrast, fatty augmentation causing an increase in size of the graft is relatively common in young children, owing to the normal proliferation of fat cells, and can be managed by surgical debulking of the graft [9]. Some modified techniques have been developed which help to provide an adequate graft volume. Lee et al. [10] recommend simultaneously performing secondary implantation and dermis fat graft placement,

which may be beneficial in cases of avascular porous implant exposure with significant overlying conjunctival insufficiency. Kim et al. [3] performed a two-stage operation that allows for a safe orbital implant insertion of the correct size without high tension concerns, as the defect area was first sufficiently reconstructed with a dermis fat graft.

As a result of the patient's relatively young age and the fact that the original evisceration was not related to chemical injury or severe tissue contraction, there was no graft atrophy nor implant exposure at the six-month follow-up. She was also satisfied with the cosmetic appearance and motility postoperatively. The use of alternative covering materials for tension-free conjunctival closure in the present case seemed to be a better surgical option than direct conjunctival closure for prevention of orbital implant exposure and for allowing the use of a well-fitting prosthesis. Dermis fat graft can be used for primary or secondary orbital implant insertion for management of large conjunctiva defects. Our case demonstrates that secondary dermis fat implantation was an effective method for treatment of an exposed orbital implant and empty socket after extrusion of an orbital implant.

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