Autologous Fascia Lata Grafts for Scleral Repair in Eyes With Infectious Necrotizing Scleritis

Infectious necrotizing scleritis is a rare but devastating disease that often develops after trauma or surgery. A delay in the diagnosis or inappropriate treatment can cause a progression of the infection to scleral thinning and even perforation of the eye, resulting in endophthalmitis and blindness. For cases that do not respond to medical therapy or when the necrosis has advanced to perforation, surgical treatment is necessary to debride the septic tissues and to repair and stabilize the sclera.

Here we describe the successful treatment of 2 cases of infectious necrotizing scleritis with autologous fascia lata graft transplantation.

Report of Cases. Neither of our cases had a history of systemic autoimmune disease. Necrotized scleral tissues were removed to expose the normal sclera, following which the ocular surface was washed with 100 mL of ceftazidime, 0.5%. The fascia lata graft was dissected from the biceps femoris of the leg. The graft was trimmed and placed over the scleral defect and fixed with interrupted 10-0 nylon sutures. An amniotic membrane (case 1) or a pedicle conjunctival flap (case 2) was transplanted over the fascia lata graft. At the end of surgery, a single subconjunctival injection of 0.3 mL of ceftazidime, 0.5%, was given. The oral antibiotic cefdinir (100 mg 3 times per day) was prescribed for 4 days following the operation, and the patients had no leg complications after surgery. The details of topical antibiotics used are described below.

Case 1. A 79-year-old woman had a 2-year history of redness and ocular pain in her right eye. She had visited 5 clinics, including a psychologist, for the persistence of the severe ocular pain. A clinical diagnosis of scleritis had been made, and treatment with topical antibiotics (fluoroquinolones and cefmenoxime, etc), steroids, and antihistamine were commenced without improvement. On our examination, her best-corrected visual acuity was 0.08 OD (Snellen equivalent, 20/250) and 0.6 OS (20/30). The intraocular pressure was 6 mm Hg OD and 9 mm Hg OS. The bulbar conjunctiva of her right eye was extremely hyperemic, and the nasal half of the sclera was necrotic, with a yellowish 4×4-mm calcium plaque deposit (Figure 1A). A sectorial opacity on her nasal cornea suggested an earlier pterygium surgery. Her intraocular examinations showed moderate cataract and posterior synechiae without active anterior chamber reaction.

Surgery was performed to remove the abscess and necrotized sclera to expose an approximately 10×25-mm large scleral defect (Figure 2A and B). A combined transplantation of fascia lata and amniotic membrane (epithelial side up) was performed (Figure 2C and D). Histology of the resected tissue showed infiltration of neutrophils, and cultivation detected Pseudomonas aeruginosa (Figure 3A). The postoperative treatment included topical moxifloxacin, 0.5%, and tobramycin, 0.3%, both 4 times daily, and fluorometholone, 0.1%, twice daily for 2 weeks. The patient recovered uneventfully, and her ocular pain disappeared 1 week after the operation. She could sleep without taking any analgesics and tranquilizers for the first time in 2 years. No recurrence of infection was noted for the 6-month follow-up period before she was lost to follow-up (Figure 1B).
Case 2. A 66-year-old man had dust blown into his right eye, and the eye was washed and treated with topical antibiotics (fluoroquinolones) and steroids. The redness and pain persisted for about 2 months before he was referred to us with a clinical diagnosis of conjunctival neoplasm. On examination, his best-corrected visual acuity and intraocular pressure were normal in both eyes. The temporal bulbar conjunctiva of his right eye was hyperemic, with a 3 × 4-mm subconjunctival mass protruding at the 9-o’clock position (Figure 1C). His intraocular findings were normal.

Surgery was performed to remove the subconjunctival abscess and the necrotized sclera. A 6 × 8-mm scleral defect was repaired with a fascia lata graft along with a pedicle conjunctival flap. Histopathological study of the resected tissue showed hyphae of filamentous fungus in the deep scleral lamella (Figure 3B). His postoperative treatment included levofloxacin, 0.5%, 3 times per day, fluorometholone, 0.1%, twice daily, and voriconazole, 1%, and pimaricin, 1%, ointment both 4 times per day for 3 weeks. The patient recovered uneventfully without recurrence during the follow-up period of 2 years (Figure 1D).

**Comment.** Fascia lata grafts have been used for scleromalacia perforans in autoimmune diseases, as scleral enforcement in progressive myopia, and as alternative implant material after evisceration of the globe. A MEDLINE search for articles documenting the use of autologous fascia lata graft with an amniotic membrane on infectious necrotizing scleritis yielded no results. Our case was also the first study to our knowledge to combine a transplantation of fascia lata and amniotic membrane to repair a large scleral defect.

Our first case was probably caused by a late-onset postsurgical infection, and the second case was likely owing to a foreign body invasion. Infectious necrotizing scleritis is intractable, even with fortified medical therapy. *P aeruginosa*, the most frequently isolated bacteria in cases of necrotizing scleritis, is virulent and capable of releasing a variety of exotoxins such as exotoxin A, exoenzyme S, and elastase, causing extensive scleral thinning and melting. Fungal infections are difficult to treat once they invade the deep scleral lamella, and the diagnosis becomes more difficult. In addition, the strength of topical antibiotic can be greatly reduced. Both of our patients resisted long-term medical treatment and required surgical intervention.

A complete debridement of the septic tissues to expose normal sclera is essential to remove the infection and a good adhesion of the graft. Compared with other available graft materials, eg, sclera, cornea, dermis, and Gore-Tex (synthetic), autologous fascia lata is ideal because of its bioadaptability and adaptable size and thickness.2,3

Of particular interest in our first case was the combined transplantation of fascia lata with amniotic membrane for a large scleral repair. This patient had ocular pain for a long time owing to progressive and diffuse scleral necrosis with severe inflammation. The amniotic membrane is known to have anti-inflammatory, antiangiogenic, and antiscarring effects.4 In an animal model, an amniotic membrane transplantation has been shown to be a useful adjunctive treatment for bacterial keratitis by improving the healing process, decreasing corneal haze, and neovascularization.5 Our case showed the outcome of the ocular

**Figure 2.** Intraoperative appearance of the combined transplantation of fascia lata graft and amniotic membrane in case 1. A, Dissection of the conjunctiva to debride the necrotic and melted tissues is shown. B, After debridement, the scleral defect appeared to be much larger (white dashed line) than estimated preoperatively. C, The fascia lata (FL) graft was transplanted over the scleral defect and sutured with interrupted 10-0 nylon sutures. D, Amniotic membrane (AM) transplantation over the FL graft is shown.

**Figure 3.** Histopathology of the resected necrotic sclera. A, Gram-negative bacteria (arrows) are identified by Gram stain, indicating *Pseudomonas aeruginosa*. B, Identification of fungal hyphae (arrows) by periodic acid-Schiff staining indicate filamentous fungus in the deep scleral lamella. Scale bar, 10 µm.
surface after surgery was tectonically and cosmetically optimal.

In summary, for infectious necrotizing scleritis that requires surgical therapy, we recommend using an autologous fascia lata graft for the sclera repair. For large defects and severely inflamed cases, a combined transplantation of fascia lata with amniotic membrane is useful.

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**Ophthalmic Images**

**Arch of Corneal Opacity**

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A 66-year-old man who had typical herpetic keratitis was treated with acyclovir ointment and topical corticosteroids. Five days after cessation of treatment, archlike opacity of the corneal stroma appeared without any epithelial defect.