The Treatment of Necrotizing Scleritis with an Autogenous Periosteal Graft

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SUMMARY

We used autogenous periosteum to reinforce scleral defects in two patients with necrotizing scleritis. This technique produced good anatomical results and maintained useful vision in each case. Autogenous periosteum offers advantages over other tissues as a tectonic graft for necrotizing scleritis, since it is easy to harvest and handle, it is strong and vascular, and is not subject to immunologic rejection.

Necrotizing scleritis is a rare form of scleral disease characterized by granulomatous inflammation and destruction of scleral collagen fibers.\(^1\)\(^2\) Scleral necrosis and thinning may lead to exposure of the underlying uvea or staphyloma formation that may threaten the integrity of the globe. Treatment of this disease includes the use of systemic nonsteroidal anti-inflammatory medications, corticosteroids, or immunosuppressive therapy to arrest the necrotizing process.\(^1\)\(^-\)\(^4\) Occasionally, surgical therapy involving a lamellar grafting technique may be required to reinforce scleral or peripheral corneal defects. A variety of homografts and autografts have been used with variable success.\(^5\)\(^-\)\(^15\) Autogenous periosteum offers distinct advantages for scleral reinforcement and previous experience with this tissue has been encouraging.\(^13\)\(^-\)\(^15\) This report describes two cases in which autogenous periosteum was successfully used to repair scleral defects associated with necrotizing scleritis.

CASE REPORTS

CASE 1

This 61-year-old woman had a two-year history of polyarticul-
made along the anterior tibial crest beginning about 8 cm below the anterior tibial tubercle. Metzenbaum scissors were used to bluntly dissect the overlying subcutaneous tissue free from the tibial periosteum. A periosteal elevator was used to free periosteum from the anteromedial surface of the tibia. A No. 15 Bard-Parker blade and scissors were used to excise a 5 x 2-cm piece of periosteum, which was placed in saline-soaked gauze. The wound was closed in two layers with interrupted 4-0 chromic and 5-0 Dermabond sutures.

A thin conjunctival flap was undermined surrounding the scleral defect. Scleral lamellar dissection was extended beyond the scleral defect into healthy sclera posteriorly and into normal cornea anteriorly as a 2-mm wide superficial keratectomy. The periosteal graft was cleared of excessive adipose tissue and sutured to the posterior margin of the scleral lamellar bed with interrupted 9-0 nylon sutures. The anterior margin of the graft was trimmed with scissors and inlaid into the superficial keratectomy. The periosteal graft was covered with the conjunctival flap.

Postoperatively, the patient was treated with scopolamine 0.25% drops twice daily and dexamethasone 0.1% drops four times a day in addition to her previous systemic medications. The postoperative course was uncomplicated and dosages of the topical corticosteroids and cyclopentolate were tapered one month after surgery. Four months after surgery, best corrected vision was 20/25 in the operated eye. Slit-lamp examination revealed a clear conjunctival flap overlying the periosteal graft, which was healed (Figure 2). No evidence of recurrent scleromalacia was seen.

CASE 2

This 60-year-old woman had a 10-year history of seropositive polyarticular rheumatoid arthritis. During the previous two and a half years, her condition had been controlled with oral prednisone (10 mg q.d.) in addition to intramuscular gold sodium thiomolate. Bilateral lens opacities developed as a complication of her systemic steroid therapy, and she complained of gradual visual loss that was more pronounced in the right eye.

General physical examination revealed deformities of both wrists, the proximal interphalangeal joints of all fingers on both hands, and the second and third metacarpophalangeal joints of both hands. Best corrected vision was 20/100, OD, and 20/40, OS. On slit-lamp examination, bulbar conjunctiva and sclera were clear, OU. The anterior segment examination was remarkable for a moderate posterior subcapsular cataract, OD, and an early posterior subcapsular cataract, OS. The intraocular pressure measured by applanation was 14 mm Hg, OU. Although the media were hazy, indirect ophthalmoscopy showed no fundus pathology in either eye.

Laboratory data included: white blood cell count, 5,000/ mm³; hemoglobin, 14 g/dl; hematocrit, 43.5%; erythrocyte sedimentation rate (Westergren), 30 mm/hr; latex fixation, +1:1280.

The patient underwent an uncomplicated planned extracapsular cataract extraction and insertion of a posterior chamber intraocular lens, OD. The early postoperative course was unremarkable. The uncorrected visual acuity was 20/80 on the first
FIGURE 4: Case 2. Slit-lamp photograph of the same eye eight months after an autogenous periosteal graft and wound revision. The healed periosteal graft is covered by a mildly injected bulbar conjunctiva.

postoperative day. The corneoscleral wound was well apposed. The cornea was clear and a moderate iridocyclitis was present. The patient was discharged on the second postoperative day on therapy of topical dexamethasone 0.1% four times a day.

The patient returned one week later complaining of decreased vision, OD. She had no associated pain, increased redness, or discharge. Best corrected vision in the operated eye was 20/400. Slit-lamp examination revealed an avascular and partially necrotic conjunctival flap that had retracted from the superior limbus (Figure 3). A 3- to 4-mm wide band of paraliminal scleral necrosis extended from the 10 o'clock to the 2 o'clock meridian. The corneoscleral sutures were loose and a partial wound dehiscence was noted. The anterior chamber remained formed and moderate iridocyclitis was present. The fundus of the right eye appeared normal, although the media were hazy. A diagnosis of acute necrotizing scleritis was made with early dehiscence of the corneoscleral wound was made.

Wound revision and repair of the scleral defect were done as described in Case 1. The postoperative course was unremarkable and topical cycloplegia and corticosteroids were gradually tapered after two months. Eight months after surgery, best corrected vision was 20/50 in the operated eye. Slit-lamp examination showed mild injection of the superior bulbar conjunctiva, which covered a well-healed periosteal graft (Figure 4). The corneoscleral wound was apposed, and the cornea and anterior chamber were clear. Fundus examination revealed surface wrinkling maculopathy.

Case 2. Case 1 presented a typical clinical picture of scleromalacia perforans, which is a form of necrotizing scleritis most commonly seen in postmenopausal women with longstanding polyarticular rheumatoid arthritis.1,19 It is characterized by the appearance of scleral nodules that appear histologically similar to rheumatoid nodules.20,21 This form of scleritis is usually associated with minimal inflammation and patients may remain asymptomatic despite marked scleral destruction and thinning.1 Necrotizing scleritis probably results from an autoimmune process that may produce a vasculitis involving the paralimbal vasculature.2,17,18

The goal of medical treatment for necrotizing scleritis is to relieve discomfort and arrest the progression of the disease by controlling granulomatous inflammation. Local therapy is usually ineffective since necrotizing scleritis often represents an ocular manifestation of a systemic disease.1,2 Treatment may include systemic nonsteroidal anti-inflammatory medications, corticosteroids, or immunosuppressive agents.1-4

Although surgery is rarely required to manage necrotizing scleritis, a graft may be necessary to provide tectonic support to an area of weakened sclera. Surgery is indicated to repair an impending scleral perforation and to treat progressive necrotizing scleritis and keratolysis that is unresponsive to medical therapy. Previous reports described the use of sclera5-7 and aortic homografts,12 and autografts of buccal mucosa,18 conjunctiva,18 fascia lata,6,11 and auricular cartilage.15

Autogenous periosteum has also been used successfully to repair scleral defects associated with necrotizing scleritis. Breslin et al.13 reported the use of autogenous periosteum to reinforce areas of weakened sclera in patients with necrotizing scleritis in whom necrosis and melting of scleral grafts develop. Rao et al.14 used a primary autogenous periosteal graft to repair an area of scleral necrosis in a patient with scleromalacia perforans.

Autogenous periosteum offers advantages (over other tissues) as graft material because it is easy to harvest and handle, it is strong and vascular, and it is not subject to immunologic rejection. Unlike banked scleral homografts, which may become necrotic and slough after surgery, periosteal grafts appear to revascularize and scar to the recipient bed.16 In each of the cases described in this report, a good anatomical result and useful vision were obtained after the repair of necrotizing scleral defects with autogenous periosteum. Although our experience is limited, autogenous periosteum appears to be an excellent tissue for the surgical management of necrotizing scleral disease.

REFERENCES

NECROTIZING SCLERITIS