Surgically Induced Necrotizing Scleritis – A Case Series

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Abstract

Surgically induced necrotizing scleritis (SINS) is a rare complication of ocular surgeries like cataract extraction, strabismus correction, scleral buckle, trabeculectomy, pterygium excision, pars plana vitrectomy and diode laser cyclophotocoagulation. It is associated with systemic collagen vascular diseases like rheumatoid arthritis, polyarteritis nodosa, Wegener’s granulomatous etc. It can occur on the first postoperative day or forty years after surgery. We report four cases of necrotizing scleritis, three following cataract extraction and one after pterygium excision with amniotic membrane transplantation, with no associated systemic illnesses. Autoimmunity, multiple surgeries, local ischemia have been implicated in its pathogenesis. Prompt diagnosis and treatment with non-steroidal anti-inflammatory drugs or immunosuppressives can prevent morbid complications.

Keywords: Surgically induced necrotizing scleritis (SINS), cataract surgery complication, pterygium, amniotic membrane transplantation.

Introduction

Surgically induced necrotizing scleritis (SINS) is a rare sequela of various ocular surgeries like cataract extraction, strabismus correction, scleral buckle, trabeculectomy, pterygium excision, pars plana vitrectomy and diode laser cyclophotocoagulation. This entity is known to occur commonly in patients with systemic illnesses like rheumatoid arthritis and various other collagen vascular diseases. We report four cases of necrotizing scleritis, three following cataract extraction and one after pterygium excision with amniotic membrane transplantation, with no associated systemic illnesses. It is important to diagnose this condition as early diagnosis and prompt treatment with non-steroidal anti-inflammatory drugs (NSAIDs) or immunosuppressives can prevent morbid ocular sequelae in most of the patients. The various etiological mechanisms put forward for this clinical entity and treatment are discussed.

Case Report

CASE 1

Seventy year old lady presented eight weeks after extracapsular cataract extraction with severe pain and decreased vision in right eye. She gave no history of diabetes mellitus, hypertension and collagen vascular diseases. Her best corrected vision in the involved eye was 3/60. Slit lamp examination showed a 5 × 3 mm area of scleral necrosis overlying the section with iris prolapse and severe tenderness (Fig. 1). There was mild...
corneal edema, no evidence of cells and flare in the anterior chamber. On indirect ophthalmoscopy the media was fairly clear, no vitreous exudates were seen. Investigations showed a raised erythrocyte sedimentation rate (ESR) of 40 mm/hr. C-reactive protein, Rheumatoid factor and Anti-Nuclear Antibody (ANA) were negative. She was treated with topical antibiotic-steroid eye drops (gatifloxacin 0.3% & 0.1% Dexamethasone) Q 4th hourly and oral Indomethacin 75 mg od. The area of scleral necrosis stabilized on follow up after 4 weeks and vision improved to 6/18.

**Case 2**

An 80 year old male was referred as a case of scleromalacia perforans (LE) following cataract surgery. Three weeks after small incision cataract surgery he presented with a sudden drop in vision when iris prolapse was noted and underwent iris repositioning with suturing of the wound. Two and a half months later he presented to us with severe pain, redness and poor vision in the same eye. On ocular examination visual acuity in the right eye was found to be 6/9 and 2/60 in the left. Slit lamp examination of the left eye showed mild corneal edema with 2+ cells. The anterior chamber was shallow superiorly with an area of scleral thinning 10×6 mm at the section with iris prolapse (Fig2). A fibrinous membrane was also noted on the surface of the IOL. On fundus examination disc was hazily seen and details were unclear. Investigations showed a raised ESR of 46 mm, C-reactive protein was positive at 7ng/dl. Rheumatoid factor and ANA was negative. He was treated with oral prednisolone 60 mg/day and 0.1% dexamethasone eye drops with which he improved.

**Case 3**

Young lady 40 years of age presented with fleshy pterygium in both eyes. She underwent pterygium excision with amniotic membrane transplantation which was sutured with 6-0 vicryl. Until the second postoperative week the amniotic membrane was in situ and the underlying sclera was healthy. On the third postoperative week scleral thinning and uveal tissue exposure was noted. Her ESR was 40mm, RA factor negative, ANA negative. She was treated with topical (1% prednisolone acetate 4th hourly) and systemic steroids (prednisolone 1mg/kg). She responded well to treatment and in two weeks the scleral thining stabilized.

**Case 4**

Young lady 40 years of age underwent cataract extraction in the right eye. Four weeks after an uncomplicated small incision cataract extraction painful scleral thinning at the section was noted on follow up. There was no drop in vision (V/A 20/20 OD) and no reaction in the anterior chamber. Her ESR was 30mm, RA factor negative, ANA negative. Her topical steroid was maintained at Q 4th hourly. Oral NSAID (Tab Ibuprofen 400mg TID) was also started. In three weeks the scleral thinning stabilized and the congestion decreased.

The four cases are summarized in table 1.

**Discussion**

The hypothesis put forward for the pathogenesis of surgically induced necrotizing scleritis is varied and complex. Autoimmunity is a well accepted etiological factor in the development of SINS. Clinical or serological markers for connective tissue disorders are present in as many as 62% of cases. Episcleral vessels are affected in systemic vasculitis and immune complexes have been found to be deposited in and around episcleral vessel walls by immunofluorescence techniques.

The time of onset of the condition ranges from first postoperative day to as long as forty years. Causative factors resulting in local ischemia due to disruption of episcleral vasculature in squint surgery, scleral buckle and excessive use of cautery have been implicated in the pathogenesis of necrotizing scleritis especially in patients developing it in the early postoperative period. But then their rapid response to immunosuppressive agents also supports the view of immunological reaction involved in the pathogenesis.

Multiple ocular surgery is one of the predisposing factors for necrotizing scleritis. Hence it may be due to a hypersensitivity reaction directed against the antigen revealed or altered following tissue damage due the first surgery.
SINS occurring after pterygium surgery has been frequently reported following the use of adjuvant mitomycin/thiotepa or beta irradiation or bare sclera technique. In our scenario it occurred following use of amniotic membrane transplantation which has not been reported before. Use of irradiation or antiproliferative agents causes obliterative endarteritis or inhibition of endothelial proliferation resulting in local ischemia and necrosis. In the absence of above, excessive use of cautery has been implicated as the cause for scleral necrosis especially in bare sclera technique.

When treated early and when not associated with systemic diseases SINS responds well to topical and oral NSAIDS or steroids as in our case series. Patients who are positive for ANA and other serological markers for autoimmunity may require systemic cyclosporine or azathioprine for response. Surgical treatment with scleral or corneal patch graft is considered when there is no response to medical therapy with impending perforation.

### Conclusion

Though SINS is a rare postoperative complication, prompt diagnosis and early treatment has good prognosis and can avoid need of toxic systemic immunosuppressive drugs.

### References


### Table 1. Case Summary

<table>
<thead>
<tr>
<th>S No</th>
<th>AgeYrs</th>
<th>Sex</th>
<th>Surgery done</th>
<th>Time of presentation</th>
<th>Visual acuity</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>F</td>
<td>ECCE</td>
<td>8 wks</td>
<td>3/60</td>
<td>Dexamethasone eyedrop 0.1 % &amp; oral Indomethacin</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>M</td>
<td>SICS</td>
<td>3 wks</td>
<td>2/60</td>
<td>Topical 0.1 % Dexamethasone &amp; oral Prednisolone 1 % Prednisolone acetate eyedrop &amp; oral Prednisolone</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>F</td>
<td>Pterygium</td>
<td>3 wks</td>
<td>20/20</td>
<td>Topical Dexamethasone 0.1 % &amp; oral Ibuprofen</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>F</td>
<td>SICS</td>
<td>4 wks</td>
<td>20/20</td>
<td>Topical Dexamethasone 0.1 % &amp; oral Ibuprofen</td>
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ECCE – Extracapsular cataract extraction, SICS – Small incision cataract surgery.