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Case Studies of Surgically Induced Necrotizing Scleritis: Clinical Presentation, Management and Outcomes

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Abstract: ***Surgically induced necrotizing scleritis SINS is a rare inflammatory condition that develops following ocular surgeries. This article presents two case studies, each with distinct clinical presentations, treatments, and outcomes. The cases underscore the importance of early diagnosis and timely immunosuppression in managing SINS effectively. A multidisciplinary approach is crucial in treating this sight threatening condition to ensure favorable prognoses. Purpose: The purpose of this article is to report and analyze two cases of surgically induced necrotizing scleritis SINS, highlighting the clinical presentation, management strategies, and outcomes, to contribute to the understanding and treatment of this rare but serious complication.***

Keywords: Cataract surgery, Collagen vascular disorders, Immunosuppression, surgically induced necrotizing scleritis

1. Introduction

Surgically induced necrotizing scleritis SINS is a rare but serious complication following ocular surgery. Scleral inflammation and necrosis may develop at varying intervals after various anterior and posterior segment surgeries, such as pterygium removal, cataract extraction, trabeculectomy, vitrectomy, and penetrating keratoplasty. [1 - 4] Although the precise cause of surgically induced necrotizing scleritis (SINS) has not been definitively determined, it has been shown that SINS often arises in eyes that have undergone multiple ocular surgeries. [5] Therefore, it has been hypothesised that SINS might be caused by an exaggerated immune response to an antigen that is exposed as a consequence of several surgical procedures. [9 - 11] It is acknowledged that scleral inflammation and necrosis are uncommon consequences of ocular surgery that might have disastrous effects on the eye.

2. Case Report

A retrospective study was conducted on the clinical records of two individuals who had ocular surgery and later developed scleritis. For each of the two eyes, the specifics of the operation, risk factors from the prior medical history, symptoms, and the course of therapy were recorded. The results of the indirect ophthalmoscopy, anterior segment photos, slit - lamp examination, and laboratory investigations—that is, chest x - ray, Mantoux, and full haematology and immunology profiles including a complete blood count (CBC), Erythrocyte sedimentation rate (ESR), C - reactive protein (CRP), Rapid plasma reagin (RPR), Human Immune deficiency virus (HIV), Hepatitis B and C (HBsAg and HCV), Rheumatoid arthritis (RA), Antinuclear antibody (ANA), and Anti - neutrophil cytoplasmic antibodies (ANCA) — were reviewed. For each of the two cases, the presence of infective scleritis was ruled out by analysing wound swabs using infusion broths and agar plates.

Case 1

A 56 - year - old gentleman presented with complaints of redness and foreign body sensation in his right eye, one month post small incision cataract surgery (SICS) with rigid polymethacrylate intraocular lens implantation with scleral tunnel sutured with (10 - 0) polyamide non absorbable 3 interrupted sutures. The uncorrected visual acuity VA in the right eye was 6/9, improving to 6/6 with pinhole correction. Slit lamp examination revealed circumscribed conjunctival congestion and a scleral thinning defect measuring 2mm x 2mm in the superotemporal quadrant at the wound site. Anterior chamber was deep and quiet with no hypopyon. [Fig.1] The findings in left eye was within normal limit. Posterior segment examination was within normal limits in both eyes. The patient's sole notable medical history pertained to hypertension. A diagnosis of surgically induced scleral necrosis (SINS) was made. A rheumatologist conducted a general physical examination prior to initiating immunosuppression; however, no evidence of arthritis or systemic vasculitis were detected. The results of a chest x - ray, Mantoux, and blood tests (including a complete blood count, ESR, CRP, RPR, ANA, ANCA, HIV, HBsAg and HCV) were normal. The 1: 2 titres of RA were deemed insignificant. The patient was started on intravenous methylprednisolone (IVMP) 1 gram per day for three days, systemic Doxycycline 100mg once daily, topical Prednisolone acetate 1% one hourly, Moxifloxacin 0.5% 6 - 8 times a day, and Homatropine 2% twice daily, respectively, after ruling out systemic and infective causes. Surgical intervention was planned and conjunctival peritomy was performed in order to measure the extent of scleral thinning. [Fig.2] Following the removal of tunnel wound sutures, a full thickness scleral patch graft with dimensions of 8mm x 5.5mm was positioned over the scleral defect to ensure comprehensive coverage and tectonic support and secured with polyamide sutures. Over the peritomy site, an amniotic membrane graft was placed and sutured to the conjunctiva using (8 - 0) polyglactin interrupted sutures. [Fig.3] Post operatively patient had favourable visual outcome and was managed with systemic immunosuppression consisting of oral Methotrexate 5mg for 2 days a week followed by oral

folinic acid supplementation 5mg once daily for next 5 days along with topical corticosteroids and cycloplegic, respectively. Subsequent follow - up evaluation revealed that the scleral lesion was stable and exhibiting favourable healing outcomes.

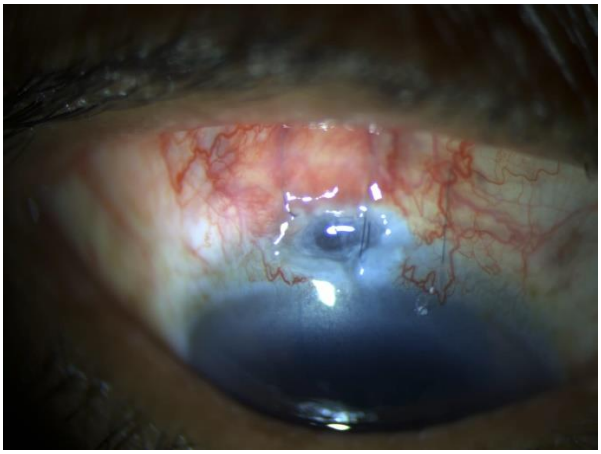

Figure 1

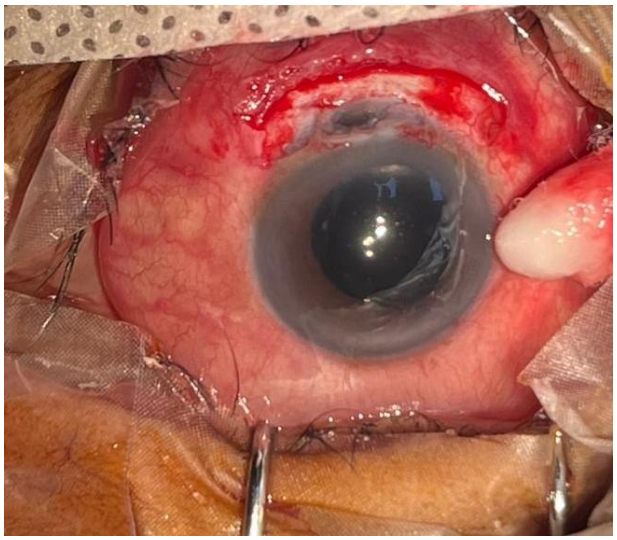

Figure 2

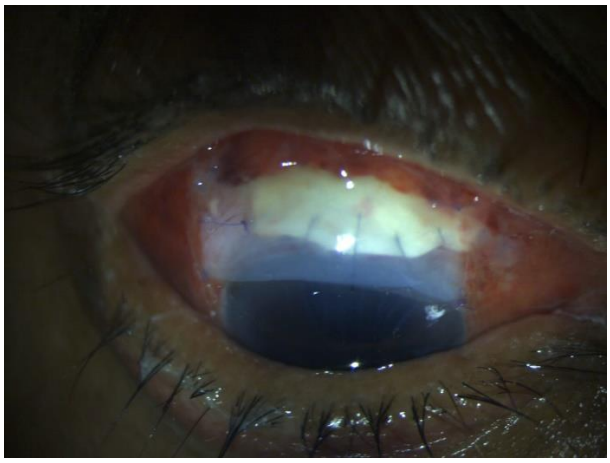

Figure 3

Case 2:

A 63 - year - old gentleman presented with complaints of redness, pain and foreign body sensation in his left eye, one month post small incision cataract surgery (SICS) with rigid polymethyacrylate intraocular lens implantation with scleral tunnel sutured with (10 - 0) polyamide non absorbable 2 interrupted sutures The uncorrected visual acuity VA in the left eye was 6/12, improving to 6/ 9 with pinhole correction. Slit lamp examination revealed circumscribed conjunctival congestion and a scleral thinning defect measuring 2mm x 3mm in the superotemporal quadrant at the wound site. Anterior chamber was deep and quiet with no hypopyon. [Fig.4] The findings in right eye was within normal limit. Posterior segment examination was within normal limits in both eyes. Patient had no significant medical history. A diagnosis of surgically induced scleral necrosis (SINS) was made. The results of a chest x - ray, Mantoux, and blood tests (including a complete blood count, ESR, ANCA, HIV, HBsAg and HCV) were normal except for CRP which was found to be raised and ANA titres were 1: 80 (weakly positive) while RPR titres found to be 1: 8. The patient was started on intravenous methylprednisolone (IVMP) 1 gram per day for three days, systemic Doxycycline 100mg once daily, topical Prednisolone acetate 1% one hourly, Moxifloxacin 0.5% 6 - 8 times a day, and Homatropine 2% twice daily, respectively, after ruling out systemic and infective causes. Surgically, the patient was managed conservatively with conjunctival suturing with 7 - 0 polyglactin and anterior chamber reformation. Oral corticosteroids were tapered in accordance with a weight - adjusted regimen. Subsequent follow - up examinations revealed satisfactory recovery, with no new ocular complaints or deterioration of vision. [Fig.5]

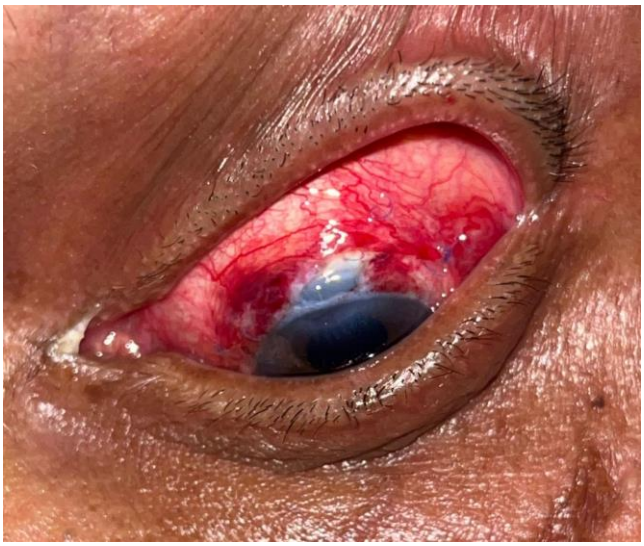

Figure 4

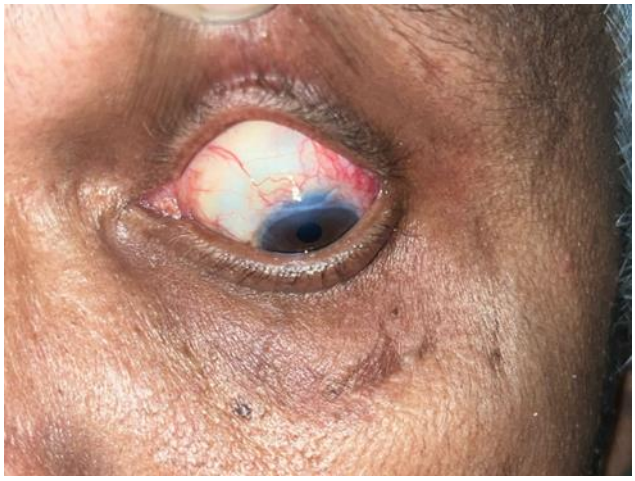

Figure 5

3. Discussion

SINS occurs most frequently at the site of incision following cataract and strabismus surgery while radiation or the administration of antimetabolites during or immediately following surgery could trigger this condition. Arensten et al. first identified it in 1976 when they reported on four individuals who had marginal corneal ulcers after cataract surgery. [1] In 1979, Lyne and Lloyd - Jones reported on a group of patients who had scleral inflammation around a surgical lesion but had no prior history of scleritis. [2] Ocular surgery may be complicated by scleral inflammation and necrosis, which can result in serious sight - threatening complications. [3 - 4] 75% of patients in the largest review of 52 eyes by O'Donoghue et al. underwent two or more ocular procedures, such as cataract extraction followed by secondary ocular surgery, cataract extraction followed by multiple detachment process. [1] The duration of onset exhibits considerable variation, spanning from a few days to several years, with the greatest documented interval lasting forty years. [1, 12] Classic SINS is thought to be characterised by a delayed hypersensitivity response to tissue antigens exposed during ischemia or moderate surgical trauma, which causes the immune system to become sensitised. [10, 13] Possible triggers for alternative hypotheses include molecular mimicry induced by infection or the deposition of generalised immune complexes. [1, 10, 13] These hypotheses are supported by the fact that SINS responds to and is managed by immunosuppressive therapy. [1, 10, 13] De la Maza et al. identified nine out of ten patients with SINS, and O'Donoghue et al. reviewed 63 percent of patients with SINS who had systemic autoimmune diseases, including thyroid disease, insulin - dependent diabetes mellitus, and collagen vascular diseases. [1, 3]

We have described two cases that exhibit similar clinical manifestations but are managed using distinct approaches: one is, slated to undergo surgical intervention, while the other is undergoing conservative treatment. The fact that both patients responded similarly and to their satisfaction to the treatment indicates that a multidisciplinary approach is warranted when managing surgically induced necrotizing scleritis. This article emphasizes the importance of recognizing surgically induced necrotizing scleritis early and managing it promptly to prevent severe complications, including potential vision loss.

4. Conclusion

Surgically induced necrotizing scleritis should be considered in patients presenting with scleritis or scleral thinning postocular surgery. Prompt initiation of systemic immunosuppression, after ruling out infection, is critical for achieving a favorable visual prognosis. A multidisciplinary approach is essential in managing this condition effectively.

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Legends:
Figure 1: A circumscribed conjunctival congestion, scleral thinning defect measuring 2mm x 2mm in the superotemporal quadrant at the site of wound in right eye.

Figure 2: Intra - operative image of right eye with conjunctival peritomy and exposing the bare sclera in order to measure the extent of scleral thinning.

Figure 3: Post - operative image of right eye showing the peritomy site, an amniotic membrane graft which was placed and sutured to the conjunctiva using (8 - 0) polyglactin interrupted sutures.

Figure 4: A circumscribed conjunctival congestion, scleral thinning defect measuring 2mm x 3mm in the superotemporal quadrant at the site of wound in left eye.

Figure 5: Follow - up image of left eye showing scleral thinning defect in the superotemporal quadrant with signs of healing.