

Commentary: Corneal involvement in rheumatoid arthritis

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease. RA primarily affects the synovial joints, and less frequently extra-articular tissues, such as the eye, pleura, pericardium, and nerves. Patients with high titers of rheumatoid factor are most likely to have these extra-articular manifestations. The incidence of ocular lesions in RA in a recent Indian study by Reddy *et al.*^[1] is 39%. The ocular manifestations of RA are due to the histologic similarity in joints and ocular tissues such as sclera and cornea as both contain proteoglycans and collagen.

The ocular manifestations most commonly present as keratoconjunctivitis sicca (KCS) which may progress to severe non-inflammatory corneal melt and perforation. The scleral

lesions present as anterior nonnecrotizing and necrotizing scleritis and posterior scleritis. The RA-associated peripheral ulcerative keratitis (PUK) is often associated with necrotizing scleritis differentiating it from Mooren's ulcer. The ocular involvement usually corresponds to advanced systemic involvement due to associated subclinical systemic vasculitis. Routine Schirmer's test and Rose Bengal staining help to detect the early onset of dry eye syndrome in asymptomatic patients.

Corneal melts in RA can present as either a sterile corneal melt in a non-inflamed eye due to KCS or as PUK in an actively inflamed eye. Pathogenesis of PUK in RA is immune complex deposition by the limbal vessels resulting in an inflammatory cascade releasing tumor necrosis factor- α (TNF- α) and interleukin-1 (IL-1). This subsequently activates the complement system and increases cytokine production, recruiting

neutrophils and macrophages that release collagenases and other proteases that causes rapid keratolysis.^[2,3]

RA-associated corneal melts have significant ocular morbidity and requires early and aggressive treatment. Moreover, it heralds systemic vasculitis in more than 50% of cases and is a vision threatening complication with a poor life prognosis as well.^[4] Multidisciplinary approach is important and treatment goes hand in hand with Rheumatologists with prioritization management of the underlying RA. In acute phase systemic corticosteroids remains the mainstay of treatment. Additionally, systemic immunosuppressive agents and disease-modifying antirheumatic drugs (DMARDs) such as oral mycophenolate mofetil, methotrexate or azathioprine significantly reduce the progression of ocular disease, improve or stabilize the visual acuity, and prevent the development of the extraocular disease. In refractory cases biologics, such as rituximab, infliximab, and adalimumab may be effective.

Ocular surgical management of corneal melt is guided by the location, size, and underlying etiology of the perforation.^[5] Tectonic procedures are mainly intended to maintain the integrity of the globe. Small perforations (≤ 2 mm) can be effectively managed with cyanoacrylate glue (CAG) application and placing a bandage contact lens.^[6] The glue provides the tectonic support needed as well as facilitates building up of corneal stromal fibers. Defects larger than 3 mm can also be managed with glue by modifying the technique such as placing a mesh of 10-0 nylon suture across the defect^[7] or placing disc made out of a plastic sterile drape and then placing the CAG.^[8] Gluing is best suited for melts located away from limbus. Multilayered amniotic membrane transplantation has also been described for deep corneal ulcers or corneal perforations. However, the results in RA-associated melts are less than optimal with nearly 50% cases needing additional tectonic procedures.^[9] Tenon's patch graft has also been described for larger corneal perforations with encouraging results.^[10] If the corneal melt is not amenable to the aforementioned techniques, tectonic corneal transplantation is deemed necessary. The technique for keratoplasty is based on the size, shape, and depth of the corneal defect.^[11] Corneal/scleral patch grafts are best suited for peripheral corneal perforations and descemetocelles. Crescentic lamellar keratoplasty is needed when there is significant peripheral thinning or perforation due to PUK. Penetrating keratoplasty becomes necessary for large central perforation. To enhance the success of these procedures aggressive lubrication and tarsorrhaphy serve as useful adjuncts.

The authors of the current study describe a novel technique of intracorneal scleral patch (ICSP) supported cyanoacrylate tissue adhesive (CTA) application in corneal perforations, >3.0 mm secondary to RA wherein partial thickness scleral patch has been placed in the corneal perforation site and the edge has been fitted into the lamellar intracorneal pocket.^[12] This surgical technique is a successful alternative option to emergency penetrating keratoplasty.

In conclusion, all patients with RA must undergo regular ophthalmologic evaluation even though they are asymptomatic to ensure early identification of ocular involvement and thus to help alleviate the problems of visual impairment and blindness. For effective management of any ocular complications that may arise, collaborative efforts between the ophthalmologists and rheumatologists involved in the evaluation and treatment of patients with RA are essential.

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