Case Report

Scleral Buckling and Corneal Topography in a Rare Case of Keratoconus with Rhegmatogenous Retinal Detachment in an Indian Patient

B N Kalpana, Shilpa Y D, Sneha Priya Prabhakar, S M Ram Prakash, Hemalatha B C, Ravi B, Sheetal Devaru
Department of Vitreo Retina, Minto Ophthalmic Hospital, BMCRI

Abstract

Background: Management of Rhegmatogenous Retinal Detachment (RRD) in keratoconus could be challenging in various aspects. Visualisation of fundus due to altered reflex along with axial myopia could pose difficulty while performing pars plana vitrectomy. Our patient underwent Scleral Buckling with good anatomical results. We came across an isolated case of Keratoconus with Retinal detachment without any pre existing comorbidities unlike earlier reports where patients with history of atopic dermatitis had Keratoconus associated with RRD.The main purpose was to know the outcome of scleral buckling and its effect on corneal topography in a case of keratoconus with RRD. **Case:** A 35 year old female presented with diminution of vision in both eyes since childhood, but more so in the right eye (RE) since last 6 months. She was aphakic with VA of 1/60 and 2/60 in the right and left eye respectively. She was diagnosed as both eyes keratoconus with RE near total rhegmatogenous retinal detachment (RRD) with sub retinal gliosis. She gave no history of vigorous eye rubbing or atopic dermatitis. For RE she underwent uneventful scleral buckling surgery. **Observation:** In post operative follow up, the retina was attached. Placido based corneal topography was done pre operatively with keratometry reading of RE – K1 62.79@96º, K2 – 55.92@6˚ and repeated at the end of three months follow up with readings of RE – K1-61.45@98˚, K2- 54.50@ 8˚. There were minimal changes in the keratometry values post operatively with flattening of vertical meridian and horizontal meridian. **Conclusion:** In keratoconus, RD can occur without any predisposed or preceding condition. Although majority of cases are associated with atopic dermatitis and eye rubbing. Scleral buckling (SB) was successful with good functional and anatomical outcome., however it has minimal effect on corneal topography.

Key words: Keratoconus, Rhegmatogenous retinal detachment, Scleral buckling, Corneal topography.

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Corresponding author
Prof Dr. B N Kalpana
No 202, 6th main, CQAL layout
Sajakaranagar, Bangalore-560092
Phone number -9448040627
E-mail: badamikal@gmail.com

Introduction

The prevalence of rhegmatogenous retinal detachment (RRD) has been estimated to range from 6.3 to 17.9 per 100,000 people per year (Mitry D et al, 2010). Aphakia, pseudophakia, myopia are few known risk factors for RRD. Axial myopia of -3 diopters (D) quadruples

the risk of retinal detachment, and the myopia of more than -3D increases the danger of detachment tenfold (Feltgen N et al, 2014).

Incidence of retinal detachment (RD) in curvatural myopia as in Keratoconus is not known but there are reports on association of atopic dermatitis with excessive rubbing of eyes leading to keratoconus and retinal detachment (Panikkar et al,2016) (Romero-Jiménez et al 2010). Our case was an isolated case of keratoconus with RRD.

Management of RRD in keratoconus could be challenging in various aspects. Visualisation of fundus due to altered reflex along with axial myopia could pose difficulty while performing pars plana vitrectomy. Our patient underwent scleral buckling with good anatomical results and minimal corneal topographical changes. Our case was an isolated case of Keratoconus with RRD managed with SB and there are no reports managed in the above manner with its correlation to corneal topography in literature in Indian population, hence we are reporting.

Case

A 35 year lady presented to us with history of diminution of vision in both eyes since childhood but more so in right eye for past 6 months. Her best corrected visual acuity (BCVA) in right eye (RE) 1/60 and left eye (LE) 2/60. She had undergone cataract surgery possibly clear lens extraction(no records available) during her childhood, at the age of 5yrs elsewhere. No history of use of spectacles in the past. She had alternate exotropia of 30 degree with nystagmus. Detailed anterior segment examination with the slit lamp showed steepened cornea with a deep anterior chamber and aphakia in both eyes. Munson sign was positive. (Figure 1A and 1B) An oil drop sign on distant direct ophthalmoscopy in both eyes were noted. Placido disc based topography showed bow tie appearance in both eyes and fulfilled the Rebinowitz criteria for keratoconus. Topography readings in RE – K1 62.78@96º, K2 – 55.92@6 º and KISA%-58.45, LE -64.09 @90º, K2- 51.68@0˚ and KISA% - 5429. Visibility of fundus was compromised by a non dilating pupil of 5mm and a scissoring reflex. Fundus examination with indirect ophthalmoscope revealed RE – near total RRD, macula was off. There was a suspicious small break at 7.30 clock hour position with multiple sub retinal glial bands in the inferior quadrant. (Figure 4A) LE to the extent visible showed no treatable lesion. Axial length on B scan was 26mm in BE. (Figure 3) With all the above mentioned findings, diagnosis of bilateral keratoconus and RE RRD was made by cornea and retina subspeciality clinic respectively.

Patient underwent RE 279 Scleral Buckling (SB) with 240 scleral band and trans scleral cryopexy with sub retinal fluid drainage. Cryopexy was done at the site of suspicious break site. 279 SB was placed from 6o' to 9o' position (3 clock hours), 9-10mm from the limbus and secured with two sutures of 4-0 Ethibond. Sub retinal fluid was drained at 7o'clock position below the Scleral Buckle with sclerotomy and needle drainage. 360˚ scleral band was passed through sclera tunnel in three quadrants and secured over the sclera buckle. On table and immediate post operative period, the RE showed well attached retina along with persistent sub retinal glial bands. The patient was followed up weekly for two weeks which remained uneventful and at the end of three months, the BCVA of RE was 2/60 with attached retina. (Figure 5B) Topography reading post operatively at two months was K1 63.33@91˚, K2 52.71@8˚, KISA% -1750. (Figure 2B) And at the end of 3 months, the post op readings were RE – K1-61.45@98˚, K2- 54.50@ 8˚ with KISA %-2242.

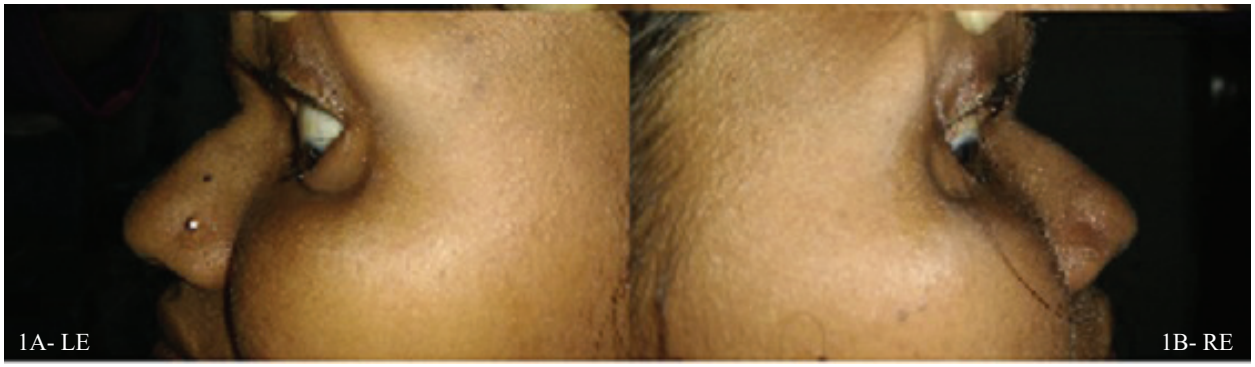

Figure 1A, 1B: Munson sign – V shaped indentation in lower lid when the patient's gaze is directed downwards.

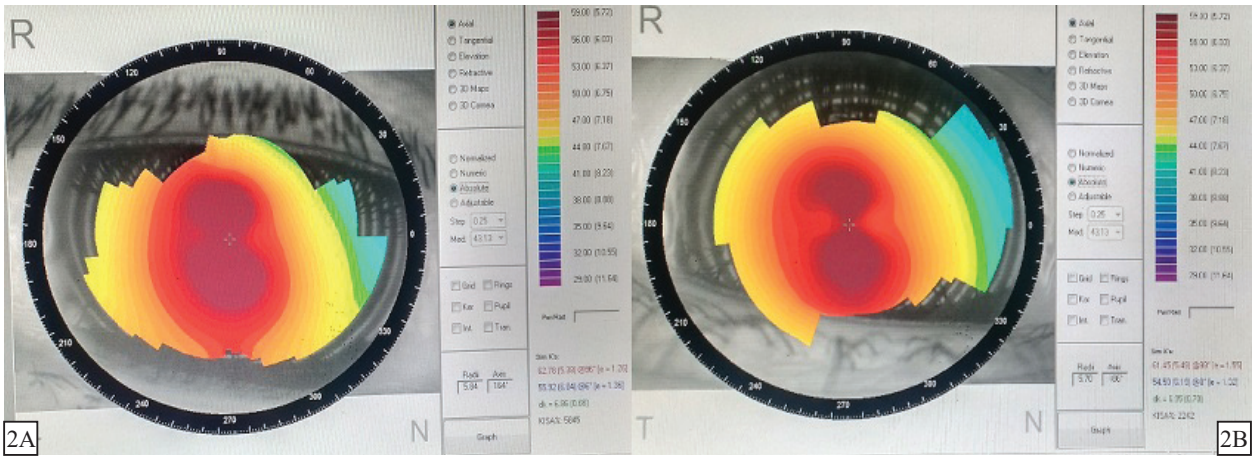

Figure 2: RE Corneal topography pre operatively(2A) and post operatively(3 months)(2B) – symmetrical bow tie pattern

2A- RE – K1 62.79@96º, K2 – 55.92@6˚,

2B (3 months post op)- RE – K1-61.45@98˚, K2-54.50@8˚

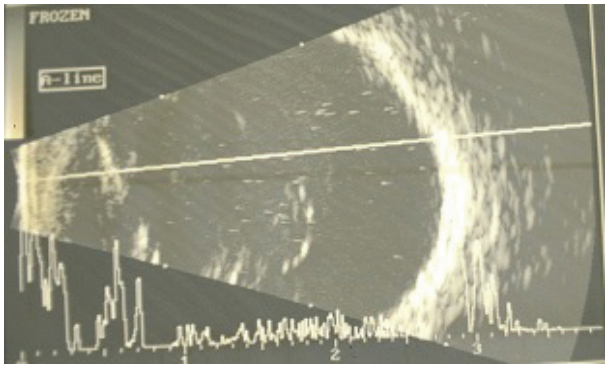

Figure 3: Right eye Bscan – post operative, Axial length -26mm

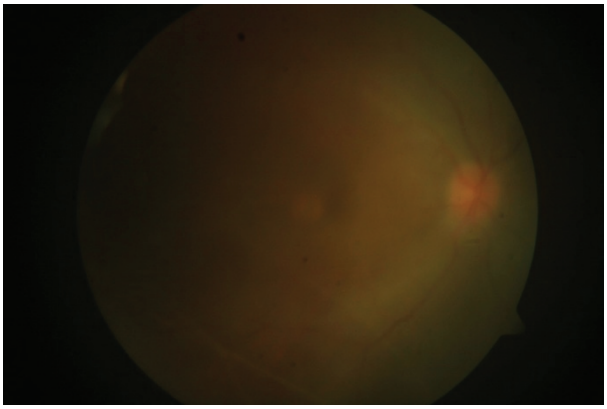

Figure 4: Pre operative fundus photo right eye - total RRD with sub retinal glial bands inferiorly

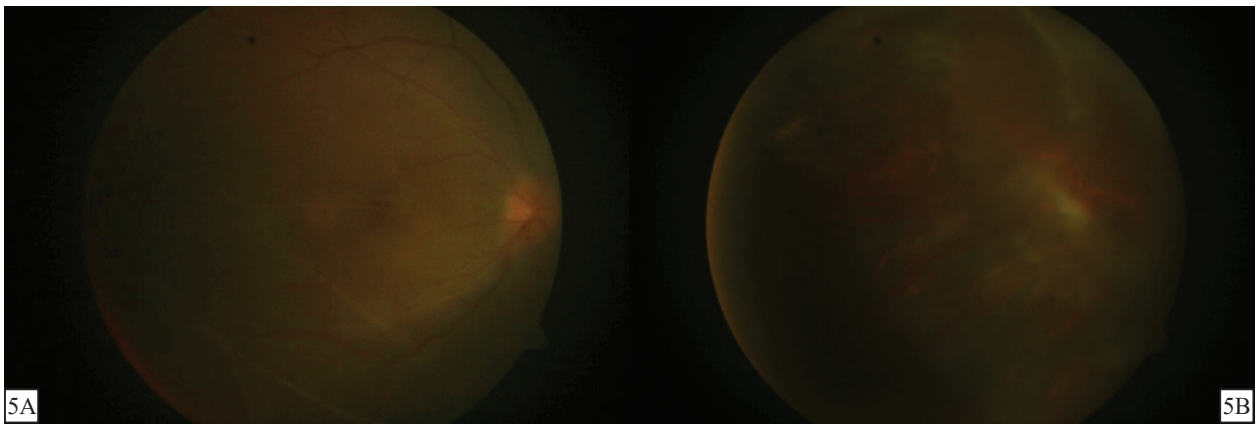

Figure 5A: 3 month post operative – posterior pole

Figure 5B: Well apposed break by buckle indent in infero temporal quadrant.

Discussion

Keratoconus is the most common primary ectasia of the cornea. It occurs in the second decade of life and affects both genders. The estimated prevalence in the general population is 54 per 100,000 (Romero-Jiménez et al 2010).

It causes high curvatural myopia and irregular astigmatism which was present in our case. Characteristic features of keratoconus like scissoring reflex, Munson sign, oil drop sign, Rizzuti's sign were present in our case.

Diagnosis via computerized videokeratography using Rabinowitz criteria has a sensitivity of 98% and a specificity of 99.5% for keratoconus (Rabinowitz YS et al 1995). Indices such as the (keratometry, I-S, skew percentage, astigmatism) KISA%, was described by Rabinowitz and Rasheed. KISA % more than100 is suggestive of keratoconus. In our patient KISA % in RE was 5854 and LE was 5429.

Incidence of retinal detachment in keratoconus is not known but there are reports on association of excessive rubbing of eyes leading to keratoconus and retinal detachment. Eye rubbing causes release of cytokine interleukin-1 which results in stromal degradation (Wilson Se et al, 1996). An abnormal immune reaction causes inflammation under the area of trauma induced by rubbing the eye that results in retinal damage and breaks (Takahashi M et al 1996). However, there was no association of eye rubbing in our case.

Y Sasaki et al (2002) had a case of bilateral retinal detachment with keratoconus in a case of atopic dermatitis that was dealt by BE scleral buckling with good results. There was no association of atopic dermatitis in our case.

In a case report by Panikkar et al (2016), a case of progressive keratoconus, retinal detachment with obsessive compulsive eye rubbing, was treated with vitrectomy with silicon oil injection but because of excessive rubbing of eyes, there was extrusion of silicon oil into subconjunctival space. There is no report of keratoconus with RRD case that has been managed with SB in Indian population.

Myopia causes early liquefaction of vitreous leading to traction over the retina and consequent tears. Forward movement of vitreous gel occurs in aphakia, which effectively increases the volume of the vitreous cavity and results in increased capacity for excursion of the gel when it moves. This in turn results in greater dynamic traction at the posterior border of the vitreous base and retinal tears.

In the case being reported, there were two risk factors in the development of retinal detachment-myopia and aphakia. Keratoconus was an incidental finding diagnosed at our center when she presented with diminution of vision. There was no associated history of atopic dermatitis or eye rubbing. Vitrectomy was contemplated as the line of management but the difficulties of poor visibility of fundus due to scissoring reflex and a non dilating pupil during the procedure along with axial myopia outweighed the outcome of the procedure. Hence, Scleral buckling with trans scleral cryopexy was done. At the end of three months follow up, BCVA in RE was 2/60 which was comparable to the vision in the other eye.

Placido based corneal topography was repeated at the end of three months follow up and the findings were RE – K1-61.45@98˚, K2-54.50@ 8˚ (pre operative keratometry reading was RE – K1 62.79@96º, K2 – 55.92@6˚). Yuval Yoshua Domniz et al (June 2001) evaluated the corneal curvature changes post SB and pars plana vitrectomy in normal eyes (non keratoconus) and noted that there was significant corneal curvature changes in both during the first month which later on returned to preoperative values and was stabilised upto 3 months follow up. We did not notice much change in the contour of cornea after Scleral Bucking in our case. Although a longer follow up is needed to see if it stabilises.

Conclusion

Retinal detachment with keratoconus though common among patients with atopic dermatitis and excessive rubbing of eyes can also occur as an isolated entity. Scleral buckling may prove to be successful in such cases with better anatomical and functional outcome however it has minimal effect on corneal topography.

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