



Anterior Migration of the Encircling Band: A Report of Two Cases

Ziya Ayhan¹, Gül Arıkan¹, Aylin Yaman¹, Ismet Durak¹ and A. Osman Saatci^{1*}

¹Department of Ophthalmology, Dokuz Eylül University, Mithatpasa Cad, 35340 Izmir, Turkey.

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/OR/2015/15353

Editor(s):

(1) Ahmad M Mansour, Department of Ophthalmology, American University of Beirut, Lebanon.

Reviewers:

(1) Morteza Movassat, ophthalmology, Tehran University, Iran.

(2) Anonymous, Italy.

Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=889&id=23&aid=7481>

Case Study

Received 22nd November 2014

Accepted 6th December 2014

Published 26th December 2014

ABSTRACT

Aim: To reiterate the clinical course and management of the cases with anteriorly migrated encircling band.

Report of the Cases: We describe two patients with the migration of a solid silicone encircling band through the insertions of rectus muscles after the successful retinal detachment surgery (cheesewiring phenomenon). While the first patient had also refractory secondary glaucoma and underwent transscleral diode laser photocoagulation several times, the second patient had high myopia with the axial length of 30.06 mm. In both cases, encircling band was cut without further complication.

Conclusion: Cheesewiring phenomenon can be rarely seen after buckling procedures and retina specialists should be aware of this rare complication and its possible causes to prevent its happening.

Keywords: Cheesewiring; retinal surgery; scleral buckling; scleral buckling complications.

1. INTRODUCTION

Although explant exposure after scleral buckling surgery is a known and rather common

complication, anterior migration of a solid encircling element through the insertion of one or more rectus muscles is a very rare complication. The mechanism of the anterior migration is

*Corresponding author: E-mail: osman.saatci@deu.edu.tr;

unknown but it has been suggested that the encircling band might cheesewire through the rectus muscle insertions with simultaneous reattachment of the transected muscle fibers back to the sclera [1-3]. We hereby describe two patients with anteriorly migrated encircling band through the rectus muscle insertions and discuss their clinical characteristics.

2. CASE 1

A 10-year-old patient from out of town was referred to us due to a traumatic retinal detachment in his left eye in July 2008. An encircling silicone band (MIRA 240, Inc., Uxbridge, MA) and a segmental circumferential buckle (MIRA 220, Inc.) between 8.30 and 12.30 meridian were placed under the lateral and superior rectus and fixed to the sclera using 5.0 polyester sutures (Dacron 5.0; Ethicon, Inc., Somerville, NJ). In addition, 20 gauge pars plana vitrectomy, 360° endolaser photocoagulation, perfluorodecalin-fluid-air-SF6 exchange and transscleral cryotherapy to vitrectomy entry sites were performed. The patient's best-corrected visual acuity (BCVA) was 20/200 in his left eye two months later.

The patient was reexamined in June 2009 with foreign body sensation and dropped visual acuity. The patient underwent uneventful phacoemulsification surgery with intraocular lens implantation in OS in his home city in between. On our examination, visual acuity was 20/320 in OS. Slit-lamp examination disclosed that the band was almost at the limbus under the inferior temporal bulbar conjunctiva (Fig. 1).

Intraocular pressure was 35 mmHg. The retina was fully attached but the cup/disc ratio was 0.9. The cause of secondary glaucoma was deemed to be multifactorial comprising of trauma, steroid usage and previous surgeries. He had no double vision and ocular motility was full. We assumed that the encircling band cheesewired through the upper and lateral rectus muscles insertions. The band was cut, released and removed under general anesthesia. Intraocular pressure remained still high despite maximum topical antiglaucomatous therapy following the removal of band. Diode laser cyclophotocoagulation was performed 180° nine times during the follow-up course. Five years after the initial vitreoretinal surgery, the left retina remained attached and the intraocular pressure was under control with two antiglaucomatous medications.

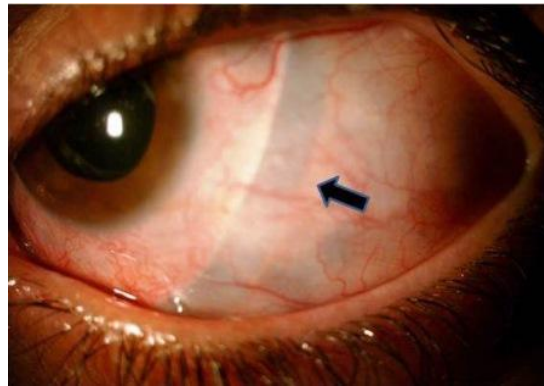


Fig. 1. Case 1, left eye, silicon band (arrow), lying almost close to temporal limbus

3. CASE 2

A 51-year-old man with high myopia underwent detachment surgery with the placement of an encircling silicone band (MIRA 240, Inc., Uxbridge, MA), segmental circumferential buckle (MIRA 220, Inc.) between 8.00 and 12.00 meridian, pars plana vitrectomy, 360° endolaser photocoagulation, and perfluorodecalin-fluid-air-SF6 exchange in his right eye in May 2011. Axial length was 30.06 mm with the laser interference biometry (IOL Master Version V2.02, Carl Zeiss) in his right eye. Four months after the successful vitreoretinal surgery, phacoemulsification surgery was performed with intraocular lens together with an implantation of capsular tension ring. The patient's best-corrected visual acuity (BCVA) was 20/200 in his right eye two months after the cataract surgery.

The patient was reexamined with visual acuity deterioration and severe foreign body sensation in his right eye in March 2013. This time, BCVA was 20/800 in OD but intraocular lens was subluxated inferiorly. The encircling silicone band was displaced and approached to limbus at the nasal side (Fig. 2).

There was no ocular motility disturbances and diplopia. Intraocular pressure was 14 mmHg in OD. Encircling silicone band and segmental circumferential buckle was surgically removed under local anesthesia. However, bag-IOL-capsular tension ring complex luxation had occurred during the surgery. Additional surgery was not performed due to extremely thin sclera. The fundus appearance with the appearance of the luxated IOL could be seen in Fig. 3.

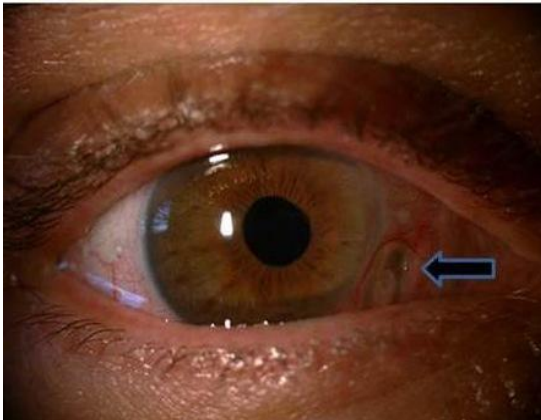


Fig. 2. Case 2, right eye, silicon band (arrow) lying adjacent to the nasal limbus

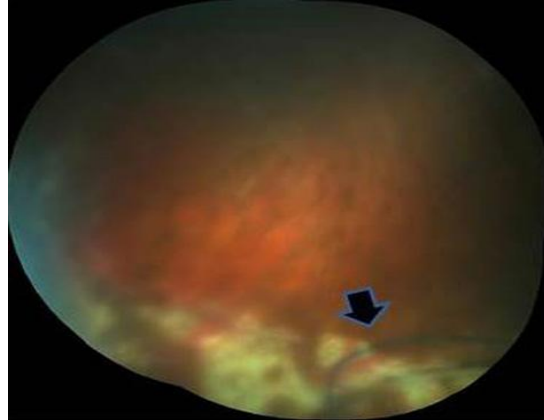


Fig. 3. Case 2, right fundus, the appearance of inferiorly dislocated intraocular lens

4. DISCUSSION

Anterior migration of a solid encircling element through the insertion of one or more rectus muscles is a very rare complication. The summary of previous reports on buckle removal and the indication was seen in the Table 1.

There are some possible risk factors for cheese wiring phenomenon: missuturing the band anterior to the equator in the initial surgery, overtightened band and an insufficient band suturation to the sclera [1-3]. Abnormal or altered muscle anatomy may also predispose to forward

Table 1. Summary of previous reports of buckle removal and the indication.

Author and the year	Number of eyes	Indications for scleral buckle removal
Pearce, Roper-Hall [4], 1969	1	Erosion and intrusion
Russo, Ruiz [5], 1971	31	Infection
Schwartz, Pruett [6], 1977	5	Pain
Hilton [7], 1978	1	Direct optic nerve injury
Yoshida et al [8], 1983	5	Anterior segment ischemia
Ho, McMeel [9], 1983	2	Endophthalmitis
Yoshizumi, Friberg [10], 1983	22	Erosion and intrusion
Ashkenazi et al [1], 1991	1	Conjunctival extrusion
Deutsch et al [11], 1992	45	Conjunctival extrusion
Talwar et al [12], 1992	1	Direct optic nerve injury
Ogosawara et al [13], 1992	4	Anterior segment ischemia
Lanigan et al [2], 1992	5	Anterior migration(3), motility dysfunction(2)
Maguire et al [3], 1993	2	Anterior migration
Saatci et al [14], 1998	1	Migration onto the corneal surface
Oshima et al [15], 1999	4	Infection
Ozertürk et al [16], 1999	1	Through upper lid extrusion
Deramo et al [17], 2001	1	Erosion and intrusion
Nguyen et al [18], 2001	4	Erosion and intrusion
Deokule et al [19], 2003	72	Extrusion, pain, infection, foreign body sensation, diplopia, scleritis/redness
Le Rouic et al [20], 2003	15	Pain
Pathengay et al [21], 2004	66	Infections
Kumar et al [22], 2004	1	Erosion and intrusion
Tay et al [23], 2007	1	Endophthalmitis
Khan et al [24], 2009	1	Through upper lid extrusion
Ozgur et al [25], 2010	1	Through upper lid extrusion
Kotoulaset al [26], 2014	1	Orbital cellulitis
Bremner et al [27], 2014	1	Pupillar atonia

migration of the exoplant. In addition, silicone band may have been inadvertently placed on top of the muscle insertions instead of under the muscle [2].

Lanigan et al. [2] described five patients in whom the exoplant cheesewired through the rectus muscle insertions. Only two of the five eyes had ocular motility problems. Similarly, Maguire et al. [3] reported two cases with anteriorly migrated encircling silicone band through all four rectus muscles without any ocular motility dysfunction. The lack of ocular dysfunction might have been due to reattachment of muscle fibers to the sclera. There was no ocular motility disturbance and diplopia in our cases. The visual acuity of our cases was under 20/200 which might contribute to the absence of double vision.

Migration of encircling band into anterior chamber and onto the corneal surface was documented in two different case reports. In Pearce and Roper-Hall's case [4], silicone band eroded through the sclera and dissected into the cornea to lie intracorneally. The band inside the cornea was projected as a ridge in the anterior chamber and could be visualised gonioscopically. Saatci et al. [14] described a patient with an extruded encircling band straddling the cornea and subsequent corneal groove formation. There was corneal vascularization and mild corneal clouding between nasal limbus and band. The corneal groove formation recovered after removal of the band with residual corneal scarring.

In the light of this brief report, we want to reiterate the cheesewiring phenomenon seldom seen after buckling procedures and remind the retina specialists the occurrence this rare complication and its possible causes.

5. CONCLUSION

Cheesewiring phenomenon can be rarely seen after buckling procedures and retina specialists should be aware of this rare complication and its possible causes to prevent its happening.

CONSENT

Not applicable.

ETHICAL APPROVAL

Not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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