Saudi Journal of Ophthalmology (2015) 29, 192–196

Original Article

Scleral buckling surgery using multiple radial buckles: A valid option?

Aditya Sudhalkar *; Anand Sudhalkar

Abstract

Purpose: To determine whether radial buckling surgery using two or more radial buckles with or without circumferential silicone tires is still a treatment option for rhegmatogenous retinal detachment (RRD) in the current scenario.
Methods: Retrospective chart review. Patients with RRD with two or more horse-shoe tears with/without proliferative vitreoretinopathy up to grade C1 who underwent buckling surgery using at least two radial buckle segments without encircling bands or drainage and with at least a 3 year follow up were included in the study. Data collected included demographics, corrected distance visual acuity (CDVA) at baseline and final follow up, details of the examination, surgical procedure(s) and complications noted, if any. Appropriate statistical analysis was done. Statistical significance was set at $p < 0.05$.
Outcome measures: Proportion of patients who had an attached retina at final follow up, improvement in CDVA and complications.
Results: 25 patients (25 eyes; 12 males and 13 females; 9 pseudophakic) were included.
Median age: 35.15 ± 8.32 years. Median baseline CDVA: 1.97 ± 1.12 log MAR. Median final CDVA: 0.65 ± 0.37 log MAR (significant improvement). Most common presenting complaint was decreased vision (87.5%). Number of radial buckle segments placed varied between 2 and 4 per eye. One patient required vitrectomy for persistent retinal detachment. One required buckle removal for infection 5 years after the primary procedure. One patient required strabismus surgery.
Median follow up: 12.25 years ± 2.14 years. None of the other patients had any complications.
Conclusion: Radial buckling surgery (two or more segments) is a reasonably safe and valid alternative to vitrectomy for RDs with multiple breaks in different planes.

Keywords: Radial buckle, Scleral buckling, Rhegmatogenous retinal detachment

http://dx.doi.org/10.1016/j.sjopt.2014.11.004

Introduction

Scleral buckling is a time-tested treatment modality for rhegmatogenous retinal detachment,[1–5] with protagonists reporting very high success rates after a single, or uncommonly two procedures.[1–4] It requires considerable expertise in the use of the indirect ophthalmoscope for accurate localization of breaks.[1–5] Also, retinal detachment with multiple breaks in different planes is currently considered to be a relative indication for primary vitrectomy and subsequent endotamponade,[6] either with gas or silicone oil. Exponential advances in equipment, controlled fluidics, the use of micro-incisional surgery and finer instruments and the use of high resolution wide angle viewing systems have considerably reduced surgical trauma and improved the anatomic and visual outcomes.[7–10] An alternative to vitrectomy in such

Received 26 April 2014; received in revised form 9 November 2014; accepted 15 November 2014; available online 24 November 2014.

Eye Hospital and Retinal Centre, Baroda, Gujarat, India

* Corresponding author at: Address: 22 Pratapgunj, Shiv Bungalow, Near Swayamprakash Flats, Baroda 390002, Gujarat, India. Tel.: +91 2652793799.
e-mail address: adityasudhalkar@yahoo.com (A. Sudhalkar).

Peer review under responsibility of Saudi Ophthalmological Society, King Saud University

Production and hosting by Elsevier

Access this article online:
www.saudiophthaljournal.com
www.sciencedirect.com

patients is the radial placement of a silicone sponge, either single or multiple, depending upon the number of retinal tears. While cumbersome, and possibly more uncomfortable for the patient in the immediate post operative period, radial buckling surgery has the advantage of avoiding intraocular surgery and its associated complications. This in turn needs to be balanced with the possibility of sponge infections,[9] and, should the buckle surgery fail, vitrectomy. We undertook the study to analyze the long-term visual and anatomical outcomes of eyes that underwent multiple radial buckle surgery (i.e. placement of at least two radial buckles for rhegmatogenous retinal detachment and thus determine if 'complex' scleral buckling is still a valid treatment option in the current era).

Methods

A retrospective chart review was performed to look for patients who underwent scleral buckle surgery with placement of two or more radial buckles (without drainage or encircling bands). The review adhered to previous guidelines for retrospective analyses.[11] For inclusion, patients were required to have: (1) Rhegmatogenous retinal detachment with multiple tears, (2) proliferative vitreoretinopathy no worse than C1 as per the current classification, (3) scleral buckling surgery with placement of at least two radial buckle segments in the same eye. Patients who had had drainage of sub-retinal fluid, encerclage, any form of intraocular tamponade and a follow up of less than 3 years were excluded from the analysis. The institutional review board approved of the study. Informed consent for academic use of data had been obtained from patients at the time of the primary visit. The study adheres to the tenets of the Declaration of Helsinki.

The following data were obtained for analysis: (1) Demographics, (2) details of the ocular exam, i.e. the corrected distance visual acuity (CDVA, recorded in log MAR), slit lamp biomicroscopy, the retinoscopy findings, axial length measurements, gonioscopy, the intraocular pressure measured by applanation tonometry, indirect ophthalmoscopy, details of the systemic examination, surgical details, complications and the final visual and anatomical outcomes. Secondary procedures performed, if any, were noted.

A single surgeon (AMS) performed all procedures using a standardized surgical technique. Patients underwent extensive preoperative evaluation (with scleral indentation) to identify all breaks and note the configuration of the detachment as well as to note the severity of proliferative vitreoretinopathy, should it be present. The surgical procedure was performed under either peri-bulbar anesthesia or general anesthesia, if the patient was a child or an apprehensive adult. After limited peritomy in the appropriate quadrants, the corresponding recti muscles were tagged using 4–0 silk sutures. Indirect ophthalmoscopy was repeated to confirm the preoperative findings. Cryo-therapy (until blanching was just appreciated) was applied to the area of the retinal tears. Subsequently, pre placed 5–0 Dacron sutures were secured in the area where the buckle was to be placed. A radial sponge of appropriate length was then inserted into position, and the sutures tightened. As already stated, drainage or encircling procedures were not resorted to. The final buckle height was confirmed with indirect ophthalmoscopy and the retinal artery pulsations checked. Anterior chamber paracentesis was performed when needed. This was followed by closure of peritomy with 8–0 absorbable vicryl sutures.

Post-operatively, patients were given topical antibiotics (ofloxacin eye drops 0.3%) six times a day for a week, topical steroids (prednisolone acetate 1% eye drops) tapered over a month and a topical cycloplegic (homatropine 2%) at bedtime for a week. Anterior chamber paracentesis was performed when needed. Oral non-steroidal anti-inflammatory agents were advised as needed for post operative pain, if the patient had any. Patients were reviewed on post-operative days 1, 3, 5, 7, 30, 90, 180 and then yearly.

Descriptive statistics were used to analyze the data. The paired *t*-test was used, wherever appropriate. All statistical analyses were performed using the SPSS software (V. 17.0, Chicago, IL). Both the final CDVA and the proportion of patients with an attached retina at final follow up constituted the primary outcome measure. Secondary outcome measures were the noted complications, if any (Figs. 1–4).

Results

A total of 25 patients (25 eyes; 12 males and 13 females) were included in the final analysis. The median age was 35.15 ± 8.32 years with a range of 25–52 years. The median baseline spherical equivalent error was −4.00 ± 2.15 diopters (range 1.25 diopters to 10.75 diopters). The median best-corrected visual acuity at baseline was 1.97 ± 1.12 log MAR with a range of 0.1–3 log MAR. The most common presenting complaint was decreased vision (89.2%).

Examination revealed a rhegmatogenous retinal detachment in all patients. Nine patients were pseudophakic; the rest were phakic. Two of the pseudophakic patients had undergone Nd:Yag capsulotomy for posterior capsular opacification. The detachment spared the macula in 3 eyes. All patients had at least 2 breaks in 2 different quadrants, necessitating the placement of at least 2 radial buckle segments. The maximum number of radial segments placed was 4 for 4 horseshoe tears in four different quadrants in one eye. Five patients had PVR changes, the highest grade being C1. The radial buckle most commonly used was a 5.0 mm silicone sponge (style 505, MIRA Inc, Uxbridge, USA). Three patients required a 3.0 mm sponge (style 503, MIRA Inc, Uxbridge, USA).

The median final corrected visual acuity was 0.65 ± 0.37 log MAR with a range of 0.0–2 log MAR. The final median spherical equivalent error was −5.42 ± 3.14 dioptres, which was not statistically significantly different from the baseline refractive error ($p = 0.24$). The median follow up period was 12.25 years ± 2.14 years with a range of 3–16 years. Only one patient required an anterior chamber paracentesis. The patient who did require chamber paracentesis required the placement of four radial buckles; the size of the buckle however, was not larger than the aforementioned average size. It could however, be related to the number of buckles used, as none of the other patients required four radial buckles in four quadrants and none of them required a paracentesis. None of the patients had a re-detachment except one patient who developed a radial sponge infection 5 years after the procedure and had to undergo sponge removal and subsequent vitrectomy with endo-tamponade as he had a re-detachment one month after sponge removal. None of