SURGERY FOR RETINAL DETACHMENT AND PVR

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Scleral Buckling
Pneumoretinopexy
Vitrectomy
Incision making
Vitreous removal: Pre-existing PVD

DR MANISH NAGPAL
PPV
Vitrectomy, PrepVac

Alcon® Constellation®

23GA ULTRAVIT® 7500

Vacuum: 300mmHg
Cut Rate: 7500rpm

Infusion/IOP: 30mmHg
Flow: 4.6 cc/min

Illuminator1: 34%
Illuminator2: 64%
With no Pre existing PVD
Vitreous removal in Phakic eyes
Air fluid exchange

DR MANISH NAGPAL
PPV
Vitrectomy, PropVac

Vacuum: 300mmHg

Infusion/IOP: 30mmHg
Flow: 0.1 cc/min

Cutting Table: Shave

Illuminator1: 34%
Illuminator2: 64%

23GA ULTRAVIT® 7500
Endo drainage

DR MANISH NAGPAL
PPV
Vitrectomy, PropVac

Alcon®
Constellation®

23GA ULTRAVIT® 7500

Vacuum: 117 mmHg

Infusion/IOP: 30 mmHg
Flow: -0.1 cc/min

Illumination 1: 34%
Illumination 2: 64%

Cutting Table: Shave
In Macula ON RD
Endolaser
RD with Macular hole & Posterior break
Multiple Large Tears
Throwing new light on buckling surgery
Using the Vitrectomy based wide visualisation system with chandelier illumination

Classic Buckling technique without using indirect ophthalmoscope

Navrocki et al; OFFISS in RD surgery; Ophthalmic surg and lasers imaging: 2008
Aras C et al; Scleral buckling with non contact viewing system; Ophthalmologica: 2012
Cryo
Localisation
Drainage
Scleral Buckling for Rhegmatogenous Retinal Detachment Using Vitrectomy-Based Visualization Systems and Chandelier Illumination

Manish Nagpal, DO, MS, FRCS, Sidharth Bhardwaj, MS, and Navneet Mehrotra, DNB, FRF

Purpose: The objective of this study was to evaluate an alternative approach to scleral buckling surgery using vitrectomy-based chandelier visualization systems instead of the indirect ophthalmoscope.

Design: This was a prospective case series.

Methods: Ten eyes underwent scleral buckling under microscope using contact wide-angle lens with 25-gauge chandelier illumination and were followed up for 6 months.

Results: An endoreplacement was done in 8 eyes, and segmental buckle used in 2 eyes. Excellent intraoperative visualization was achieved, and all routine buckling steps were easily replicated with this approach.

Conclusions: Using contact wide-angle lens along with chandelier illumination under microscope allows good visualization for scleral buckling procedure. This approach may allow excellent visibility with zooming capabilities for each step of the procedure as well as allows transmission to a monitor in the theater for teaching purposes apart from allowing better ergonomics for the surgeon.

Key Words: scleral buckling, rhegmatogenous retinal detachment, vitrectomy-based visualization systems, chandelier illumination

(Asia-Pac J Ophthalmol 2013;2: 165-166)
Throwing New Light on Buckling Surgery

BY MANISH NAGPAL, MS, DO, FRCS(UK); SIDHARTH BHARDWAJ, MD; AND NAYNEET BEHROTRA, MD

Scleral buckling was first performed as a technique to repair rhegmatogenous retinal detachment by Curtan in 1949 and was popularized in the 1950s. The underlying principle in scleral buckling is approximation of neurosensory retina with the retinal pigment epithelium by compression of the globe wall, thus preventing passage of liquid vitreous into the subretinal space. If the break is properly closed, the retinal pigment epithelium pumps actively absorbs subretinal fluid and the retina will spontaneously re-adheres with no need for subretinal fluid drainage.

Until the introduction of pars plana vitrectomy (PPV) in the early 1990s by Mahanavi and BM, scleral buckling was the gold standard technique for management of rhegmatogenous retinal detachment. Soon after its introduction, PPV enhanced the ability to repair retinal detachments, particularly in settings of complex cases (trauma, proliferative vitreoretinopathy, PPV). The use of PPV has expanded in the repair of retinal detachments, particularly in patients with pseudophakic eyes.

Apart from vitrectomy and scleral buckling, another procedure, pneumatic retinopexy, has also been used in specific configurations of retinal detachments with breaks located superiorly. In reparation, case selection, however, also needs significant cooperation of the patient for postprocedure positioning. In aphakic eyes, it is associated with a significantly higher reattachment rate than scleral buckling, but resulted in equivalent final visual outcome and reattachment rate after reoperations.

The type of surgical procedure used for rhegmatogenous retinal detachment, however, still remains an individual surgeon-based decision that is influenced by the preoperative findings, patient characteristics, available tools for surgery, and above all, the experience and ability of the operating surgeon. What is essentially meant is that, for a fresh retinal detachment with a single superior tear, different surgeons would choose any 1 of the 3 procedures mentioned based on their specific training of experience or preference.

Figure 1: Placement of 25-gauge scleral buckle light, or experience using a certain technique.

In recent years, a shift in the decision methods can be observed, with a clear trend toward PPV. Improvements in the instrumentation and safety of PPV, along with the use of modern microscopes and wide-angle viewing systems, has enabled intraoperative visualization of retinal breaks and accurate closure of all retinal breaks and retinal reattachment in an easier and faster way. Moreover, transconjunctival sutureless vitrectomy techniques provide faster wound healing, diminished conjunctival scarring, improved patient comfort, decreased postoperative inflammation, and reduced postoperative astigmatic changes.

Scleral buckling, alternatively, has the advantage of being an extracapsular procedure, which, in the case of failure, is more forgiving than vitrectomy because PPV requires more surgery in patients who have undergone scleroscopy as a primary procedure compared with buckling. Although scleral buckling is technically easier,
Chandelier Illumination: Shedding New Light on Scleral Buckling

Scleral buckling, a time-honored technique for repairing rhegmatogenous retinal detachments, has changed very little since the 1960s, when Harvey Lincoff, MD, combined silicone sponges with cryotherapy. While scleral buckling has a very high success rate, the advent of vitrectomy has shifted vitreoretinal surgery away from this tried-and-true procedure.

The ASRS Preferences and Trends (PAT) Survey shows that from 2005 to 2013, routine recommendation of a scleral buckle fell from 27% to 9%, while the choice of vitrectomy without buckle increased from 31% to 54%.

Panelists

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More recently, the concept of using chandelier illumination along with a wide-angle viewing system has been proposed as an intriguing modification when performing primary scleral buckles. Perhaps incorporating the view we’re used to with vitrectomy will ease scleral buckling from going the way of the Indo-Md. We interviewed several experts who have been performing this technique to find out more.

What attracted you to the idea of doing chandelier scleral buckles? Do you now do all your straight-back using a chandelier, or do you still use the “traditional” method? If you used both methods, how do you choose when to use a chandelier?

Maria Berrocal: I have been doing all my buckles under the microscope for the past 15 years, and I feel that the view for passing sutures through sclera and driving is significantly enhanced. In that scenario, the Achilles heel of the procedure is localizing and examining the retina only with the view of the indirect ophthalmoscope. When I saw a video of the view with a chandelier and the HOCM wide-angle viewing system (Covista Surgical/Peri St. Louis, IL), it was obvious that this was the way to go. I now do all my buckles with chandelier and wide-angle viewing — the view is simply so much better.

Paul Hadar: I was excited to try a twist on the traditional approach to see if there were any distinct advantages. For me, these are 2 irreproachable advantages of chandelier buckling. The first relates to the directional, oblique lighting provided by the chandelier in contrast to the diffuse illumination of the indirect ophthalmoscope.

Vitrectomy surgery with a light pipe taught us that dynamic shading from a moving light pipe can provide enhanced visualization of subtle pathology that might be washed out otherwise. Similar to the chandelier provides in a focal retinal illumination that can be manipulated to provide dynamic shading and visualization of subtle retinal breaks.

The second advantage is the high magnification provided by the surgical microscope coupled with the wide-angle viewing (10D) system, in contrast to the limited magnification of the indirect. Although chandelier buckling also provides advantages of posture and education to trainers, I reserve it for retinal breaks that are difficult to detect in

I now do all my buckles with chandelier and wide-angle viewing — the view is simply so much better.

— Maria A. Berrocal, MD

*Note: Figure not patent, with a postoperative retinal detachment, 200x magnification, 10D of view, without the use of scleral buckling. Patrick Hadar, MD, 6/10,000 anterior to the sutures, without buckling, without suture, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without buckling, without suture, without 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Visualisation is the key

Scleral Buckling

Vitrectomy
Conclusion

- It would be very easy for a surgeon comfortable with vitrectomy based visualisation to adapt to this modality in case there is an indication for buckling…
- Better visualisation with zooming capabilities and ability to transmit/record surgery to a viewing monitor makes it a great teaching tool
Management of PVR
INTRODUCTION

Proliferative vitreoretinopathy (PVR) is the clinical syndrome associated with retinal traction and detachment in which cells with proliferative potential multiply and contract on retinal surfaces and in the vitreous compartment. PVR presents with a spectrum of severity ranging from subtle retinal wrinkling, to fixed folds and tears with rolled edges and to total rigid retinal detachment, retinal shortening, and advanced periretinal proliferation (Figs. 111.1 and 111.2). PVR is the most common cause of failure in retinal detachment surgery. It can occur in untreated eyes with retinal detachment, especially with vitreous hemorrhage, or after cryotherapy or even laser photocoagulation, pneumatic retinopexy, scleral buckling, or vitrectomy, and after many surgical complications. It is common after penetrating injuries and a variety of conditions associated with prolonged inflammation. Although surgical reattachment of retinas associated with PVR can now be achieved in most cases, visual results remain disappointing. Therefore, prevention through early recognition of risk factors and subtle signs of PVR and appropriate modification of
Thick pucker with inferior retinectomy
Staining
Extensive PVR
Subretinal band removal
PVR with Sub ret Silicon oil
Inferior stiff retina
THANK YOU
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