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Comparison of outcome of scleral buckling(SB) versus pars plana vitrectomy(PPV) in cases of single break primary retinal detachment at a large tertiary centre of India

Dr.Somesh Aggarwal*, Dr Paras khatwani**, Dr Tanvi Choudhary***,Dr Deepesh chhablani****, Dr Uma Gajiwala*****, Dr Anindita Duttaroy******

*Professor and head of retina unit at M&J western regional institute of ophthalmology, Ahmedabad (M.S., D.N.B.)

, *, *****, *******Resident at M&J western regional institute of ophthalmology, Ahmedabad (M.B.B.S.)

****Senior Resident at M&J western regional institute of ophthalmology, Ahmedabad (M.S.)

Corresponding Author: Dr.Somesh Aggarwal**,** Professor and head of retina unit at M&J western regional institute of ophthalmology, Ahmedabad (M.S., D.N.B.)

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Abstract

Objective : The aim of our study is to compare the outcome of scleral buckling versus pars plana vitrectomy in cases of single break RDD patients and also study the common side effects post operatively.

Mterial and methods : It was done at Retina Unit of a tertiary center in India.it was a randomized, prospective, analytical study in which 86 eyes were divided randomly into two groups, group A who underwent scleral buckling surgery and group B who underwent vitrectomy, were regularly followed up and their reattachment of retina, BCVA and Complications were studied at 6month post operatively.

Parameters studied

- Patients with attached retina at 6months post operatively
- Patients with BCVA improvement greater than 2 lines after 6 months
- Frequency of common side effects post operatively

Results : The retina was found attached in 93.02% of the patients in group A compared to 74.41% in group B. 88.37% patients achieved target BCVA improvement in group A compared to 69.76% in group B

Common side-effects in patients in group A were Sub retinal haemorrhage, Raised IOP, PVR changes and buckle infection whereas those in group B were Cataract, Raised IOP, Redetachment and optic neuropathy.

Conclusion : Scleral buckling achieves better results compared to PPV when it comes to treating single break RDD patients.

Introduction

A retinal detachment is a separation of the sensory retina from the retinal pigment epithelium (RPE) by an accumulation of fluid in the potential subretinal space.

Retinal detachments are classified into three major groups

1. Rhegmatogenous
2. Tractional
3. Exudative

A primary or spontaneous retinal detachment is a rhegmatogenous retinal detachment(RDD) in which the retinal break has not been caused by trauma, or a condition, such as proliferative retinopathy.

A number of predisposing factors play a role in the development of RRD, including cataract surgery, myopia, peripheral retinal degenerations eg, Lattice degeneration, glaucoma etc.

A variety of treatment methods are available including scleral buckling, primary PPV, PPV with scleral buckling, pneumatic retinopexy and temporary balloon tamponade. We have decided to compare the outcomes of scleral buckling versus primary PPV in patients with single break RRD.

Common side effects associated with SB are choroidal/sub retinal haemorrhage, raised intra ocular pressure(IOP), Buckle infection, proliferative vitreoretinopathy(PVR) whereas those associated with PPV are cataract, raised IOP, optic neuropathy, vitreous haemorrhage(VH), iatrogenic retinal tears.

Methods and Materials

86 eyes of eighty-six patients diagnosed as having a single break RDD by a tertiary care hospital's retina clinic were enrolled in the study between 1st June 2017 to 1st June 2018. It was a randomized, prospective, analytical study.

Patients were randomly divided into 2 groups, group A & group B. Group A patients were treated with scleral buckling and group B with PPV. Informed written consent was taken from all patients regarding nature of the study and the treatment being provided. Exclusion criteria were PVR grade C or worse, giant tears, multiple tears, H/O of trauma or penetrating injury, media opacities eg VH, dense cataract. Their best corrected visual acuity (BCVA) was taken on Snellen chart and thorough fundus examination was performed.

Surgery was performed in all the eyes under local peribulbar anaesthesia by a single surgeon.

1. In the scleral buckling group, break was sealed with cryopexy. Needle drainage was carried out for the sub retinal fluid.The break was then localized, and quadrantic silicon buckling (using a 7mm grooved silicone tire) and encirclement (using a 2.5mm silicone band).
2. In the PPV group, all eyes underwent standard three port pars plana vitrectomy. A complete vitrectomy was performed. Fluid air exchange with internal sub retinal fluid drainage was performed through the pre-existing break or if required a retinotomy was performed. Retinopexy was achieved by laser endophotocoagulation around the breaks and the retinotomy site. Silicone oil was used as a tamponading agent.

Patients were followed up for 1week, 2weeks, 6 weeks, 3 months and 6 months for anatomical reattachment,post-operative evaluation of BCVA and to record any post operative complications.

Observations

The study data was evaluated using percentage of patients in whom the retina was found attached at final visit (6 month) post operation and the result was tested using Pearson's chi-square test.

Visual outcome was evaluated as percentage of patients with vision improving to greater than 2 lines at 6months post op.

Out of total 43 patients who underwent scleral buckling, 40 patients presented with attached retina at 6-monthfollow-up whereas only 32 patients out of 46 who underwent PPV surgery had attached retina at 6months.

Discussion

In this study, we have compared the outcomes of the two most popular surgeries for retinal detachment; ie scleral buckling surgery vs vitrectomy.

PPV was first introduced in 1971 by Machemeret al.[1], bt even after its introduction, buckling remained the standard treatment modality. It is only recently with the introduction of advanced surgical instruments, that PPV is gaining popularity over buckling.

The SPR study[2] (The scleral buckling versus primary vitrectomy in rhegmatogenous retinal detachment) was a large scale study involving 5 countries with 2 groups, one having 265 pseudophakic patients and the other having 416 phakic patients. The study showed that in complicated phakic patients, buckling is superior to vitrectomy, while in pseudophakic patients, vitrectomy achieved better results.

Park et al.[3] also did a similar study in 2015 and showed 94.7% success with PPV and 77.8% success with SB. The results of this study may be biased because people less than 35yrs were excluded from the study, and buckling is known to achieve better results and lesser cataract progression in young population.[4]

The study done by H. Kogashi[5] compared the anatomical success rates of buckling vs PPV and found them to be 93.7% and 96.3% respectively, failing to prove superiority of either procedure. The study did show that break location or lens status had no significant effect in either group however patient with macula off achieved lower success rates with buckling compared with PPV.

As per the result we achieved in our study, the p value obtained for reattachment success rate is <0.05 and hence is statistically significant.

This shows that scleral buckling achieves far better outcome; in respect with functional outcome and visual prognosis, than PPV in patients with RDD due to a single peripheral break.

Benefits of Scleral buckling

- Extraocular approach, and hence very less chances of endophthalmitis
- Less chance of causing cataract
- Less risk of iatrogenic breaks
- Cheaper technique
- Lesser risk of raised IOP post-op
- cryopexy is better than laser retinopexy. In sealing the breaks

Benefits of Vitrectomy

- better outcomes in patientswith complications like VHPVR changes, multiple break, giant retinal tear etc
- lesser risk of post op PVRchanges
- Better management of intra Operative complications like Bleeding
- Better visualisation of breaksspecially those in periphery

The debate over which approach (scleral buckling versus PPV) is superior in treating RDDs is never ending, and with vitrectomy achieving better results in patients having PVR, multiple breaks, giant tears, vitreous haemorrhage, tractional RD etc, more and more people are preferring PPV over buckling. But for single tear RDDs, buckling remains the surgery of choice achieving far better outcome than PPV.

Conclusion

Scleral buckling achieves better results compared to PPV when it comes to repair of single tear RDDs and is still the procedure of choice by most surgeons.

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List of Figure and Table

Table 1: Comparison of the surgical outcomes

	No of patients with attached retina	No of patients with detached retina at 6months	Total patients
Group A	40 (93.02%)	3 (6.97%)	43
Group B	32 (74.41%)	11 (25.58%)	43

Table 2

A) Comparison of the visual outcome

	Group A	Group B
No of patients with BCVA improvement >2 lines at 6months	38 (88.37%)	30 (69.76%)

Table 3

1. Comparison of frequency of complications post operatively

Complications	Group A (No of patients)	Group B (No of patients)
• Cataract	0	7(16.27%)
• Sub retinal hemorrhage	5(11.62%)	0
• Raised IOP	2(4.65%)	4(9.30%)
• Endophthalmitis	0	1(2.32%)
• Re-detachment	1(2.32%)	3(6.97%)
• PVR changes	4(9.30%)	1(2.32%)
• Buckle infection	2(4.65%)	-
• Optic neuropathy	0	2(4.65%)

• Hypotony	0	1(2.32%)
• Choroidal detachment	1(2.32%)	0
Total number of patients with no complication at 6months	28 (65.11%)	24 (55.81%)

Figure: 1

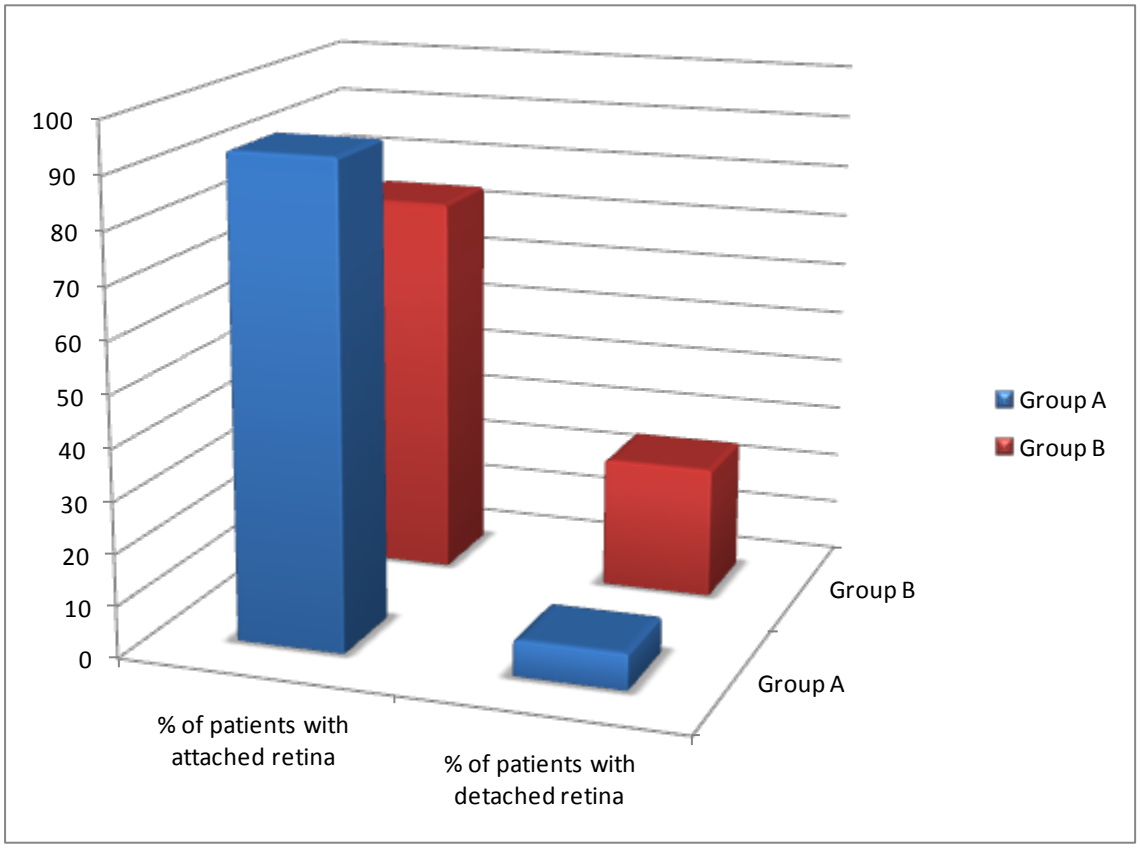

Figure 2

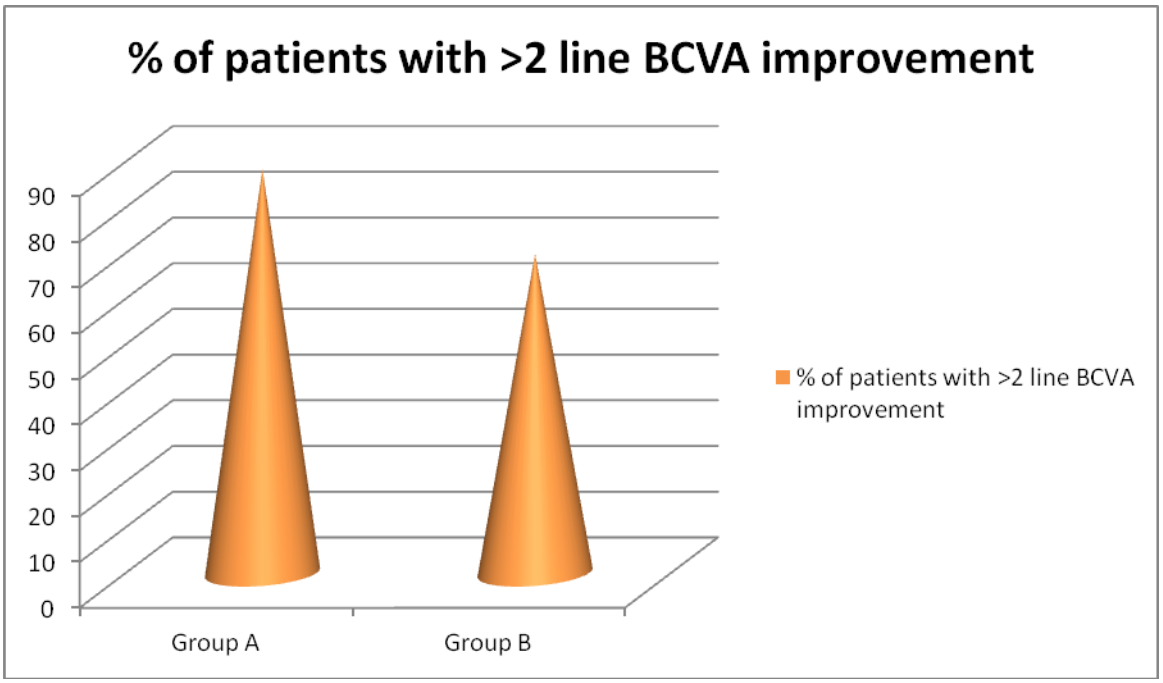

Figure 3

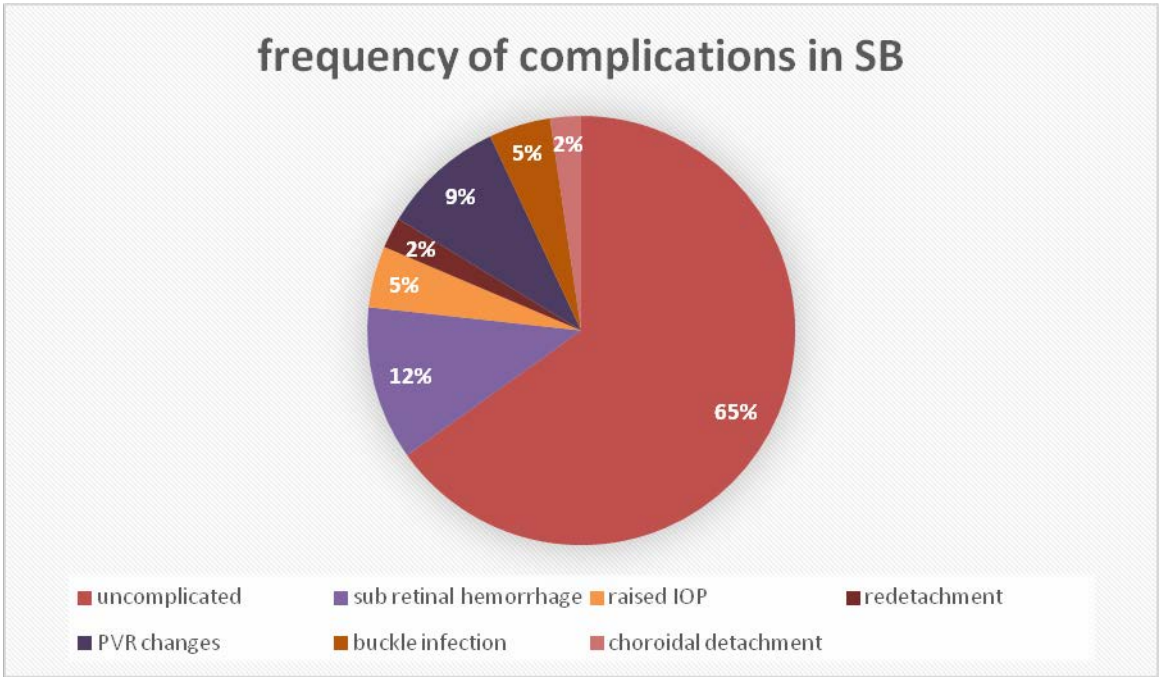

Figure 4: