



TREATMENT OF PRIMARY RHEGMATOGENOUS RETINAL DETACHMENT - SCLERAL BUCKLING OR VITRECTOMY?

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Background: Different surgical procedures are performed in the management of primary rhegmatogenous retinal detachment (RRD) based on its complexity.

Aim: To compare the functional and anatomical results of scleral buckling (SB) and 23-gauge pars plana vitrectomy (PPV) in management of primary RRD.

Methods: Retrospective study of 41 phakic eyes with primary RRD treated in 1-year-period, with minimum 6 months follow up, 21 treated with SB and 20 with PPV. In the SB procedure, all retinal breaks were localized, cryotherapy was done, and segmental scleral buckle was placed. Drainage of subretinal fluid was performed. In the standard 23-g PPV procedure, after cauterization of all retinal breaks, endolaser photocoagulation and tamponade with gas or silicone oil was done. Improvement in best corrected visual acuity (BCVA), anatomical success, number of re-

operations, cataract progression and macular complications were compared.

Results: In 21 eyes in SB group, the mean baseline BCVA was 0.28 ± 0.31 , the final BCVA was 0.66 ± 0.28 . 2 eyes (9.5%) needed re-surgery (PPV). In 20 eyes in PPV group, the mean baseline BCVA was 0.11 ± 0.16 , the final BCVA was 0.34 ± 0.25 . 3 eyes (15%) needed re-surgery. Both SB and PPV resulted in clinically significant improvement of BCVA, better in SB group (0.38 vs. 0.23 in PPV group). The anatomical success was high in both groups, better in the SB group (91.5% in SB vs. 85% in PPV). Permanent macular changes were more frequent in PPV group (25% in PPV vs. 14% in SB group). Cataract progression was significantly higher in PPV group (6 eyes (30%) vs. 3 eyes (14.2%) in SB group).

Conclusion: Both procedures still have significant roles in treatment of RRD. SB is recommended as primary procedure in younger patients with RRD in one quadrant, to reduce early cataract surgery and possible chronic macular complications. PPV, especially phaco-vitrectomy, is probably a better option in older patients, with detachment in 2 or more quadrants and longer duration of the RRD.

Keywords: scleral buckling, vitrectomy, rhegmatogenous retinal detachment

BACKGROUND

Rhegmatogenous retinal detachment (RRD) is an important cause of visual impairment. The incidence of RRD in the general population in Europe is ca. 1 in 10 000, corresponding to around 200 new cases each year in North Macedonia. The danger is greatest in the age range 55 to 70 years. The risk of retinal detachment in the second eye is between 3.5% and 5.8% in the first year and 9% to 10% within 4 years; existing detachment in one eye is therefore the most frequent risk factor [1].



Surgical management is the gold standard of care for RRD. Different surgical procedures like scleral buckling (SB), pneumoretinopexy, pars plana vitrectomy (PPV) with tamponade have been performed in the management of primary RRD, based on its complexity. Previously, SB was considered as standard therapy in the repair of primary RRD [2]. With the recent advances in vitreoretinal techniques and instruments, there is a trend towards sutureless vitrectomy to manage primary RRD. Significant evidence is available (in prospective and retrospective studies) comparing PPV vs. PPV+SB (encircling band) in the management of primary RRD [3-6]. However, there is a lack of information about the direct comparison of SB and sutureless PPV for primary RRD.

AIM

To compare the functional and anatomical results of scleral buckling and 23-gauge pars plana vitrectomy in the management of primary RRD repair.

METHODS

A retrospective study was conducted of 41 phakic eyes with primary RRD treated in 1-year-period and with minimum follow up of 6 months. 21 eyes were treated with scleral buckling and 20 with PPV. The following data was collected: ocular history, age, baseline visual acuity, a complete ocular exam, intraocular pressure (IOP) at each visit, extent and location of RRD, surgeries performed and final visual acuity after 6-month follow-up. Re-surgeries for recurrent retinal detachment, as well as cataract progression were noted.

Subjects with comorbid eye diseases that can affect visual acuity like glaucoma, macular hole, PVR more than grade B, cases of infectious retinitis, or tractional/exudative/combined RD were excluded. Pseudophakic eyes, as well as eyes with grade 2 and above cataract were also excluded from the study.

In the scleral buckling procedure, all retinal breaks were localized, retinopexy in the form of cryotherapy was done and a segmental scleral buckle of appropriate width was placed based on the location of retinal breaks. Drainage of subretinal fluid was performed.

In the PPV procedure, a 23g standard PPV was performed. All retinal breaks were cauterized, and after fluid-air exchange, endolaser photocoagulation was performed to all retinal breaks. Tamponade, in the form of gas/silicone oil (1000 Cst), was done based on the surgeon's discretion.

The primary outcome was improvement in best corrected visual acuity (BCVA), and the secondary outcomes were anatomical success, number of re-operations and cataract progression between SB vs. PPV groups.

RESULTS

In the SB group, the mean age was 44.33 ± 17.16 . The mean baseline BCVA was 0.28 ± 0.31 Snellen decimal units. From 21 eyes, 14 were macula-off and 7 were macula-on. 12 eyes had 1-quadrant detachment (7 superior-temporal, 2 superior-nasal, 3 inferior temporal) and 9 eyes had 2-quadrant RRD (3 temporal, 1 nasal, 2 superior, 3 inferior). The final BCVA was 0.66 ± 0.28 , which is an improvement of 0.38 compared to baseline BCVA. 2 eyes (9.5%) needed PPV because of re-detachment and 3 eyes were with macular complications (folds, oedema, haemorrhage). Cataract progression was noted in 3 eyes (14.2%).

In the PPV group, the mean age was 50.65 ± 10.47 , the mean baseline BCVA was 0.11 ± 0.16 Snellen decimal units. From 20 eyes in this group, 16 were macula-off and 4 were macula-on. 8 eyes had 1-quadrant detachment (6 superior-temporal, 2 inferior temporal) and 12 eyes had 2-quadrant RRD (1 temporal, 1 nasal, 6 superior, 4 inferior). The final BCVA was 0.34 ± 0.25 , which is an



improvement of 0.23 compared to baseline BCVA. 3 eyes (15%) needed re-surgery because of re-detachment and 5 eyes (25%) were with macular complications (folds, hole, fibrosis). Cataract progression was noted in 6 eyes (30%).

DISCUSSION

In this study both SB and PPV resulted in clinically significant improvement of BCVA, although this result was better in the SB group (0.38 vs. 0.23 respectively). We noticed that 1-quadrant detachments achieved better improvement of BCVA in the SB group (0.31 vs. 0.20 Snellen dec. units), while 2-quadrant detachments had comparable improvement of BCVA in both groups. (0.25 vs. 0.28 respectively).

Heimann et al. concluded that SB led to greater VA improvement in phakic, but not pseudophakic eyes, while PPV led to a higher primary anatomical success rate only in pseudophakic eyes [7]. In our study, the successful anatomical outcome was high in both groups, although better in the SB group (91.5% in SB and 85% in PPV). Permanent macular changes were more frequent in the PPV group (25%) compared to the SB group (14%), all of them in eyes with 2-quadrant RRD.

Shu et al. found that though SB and PPV exhibit similar primary anatomical reattachment rates, PPV has higher incidences of PVR and cataract formation within one year postoperatively [8]. In our study we also found that cataract progression was significantly higher in the PPV group (14,2% in SB vs, 30% in PPV group). Therefore, combining PPV with cataract surgery in patients over 45 years old has been suggested to be an effective strategy in vitreoretinal surgery, improving both surgical results and the patient's quality of life [9]. SB is recommended as the primary procedure in young phakic patients with RRD, to avoid the need for cataract surgery and subsequent PVR formation. Abu Eleinen et al. suggest that

those two methods can also coexist, and a combination approach might be most effective in difficult cases of RRD, such as those with PVR or multiple tears, particularly inferior tears [10].

The most important advantages of primary vitrectomy over SB have been itemized as its direct approach to the release of vitreous traction, the ability to deal with media opacities, improved detection of retinal holes and controlled internal drainage of subretinal fluid [11].

But, Kunikata et al. in their review suggest that although PPV is now one of the main approaches to RRD repair, if the vitreous is removed and RRD then reoccurs, the eye can easily progress to total bullous RRD with proliferative vitreoretinopathy (PVR). Thus, PPV should only be used for RRD after careful consideration and comparison with other methods [12].

The limitations of our study include the retrospective nature of the study and the small sample. The study sample is not homogenous for precise comparison as the presenting features of RRD are too varied to achieve such uniformity, therefore, we have highlighted the various differentiating morphological features of RRD between the two groups. Another important limitation is a selection bias as cases are selected for SB/PPV as per the suitability of intervention, according to the surgeon's evaluation.

CONCLUSION

There is no single ideal strategy to treat RRD. SB and PPV each have distinct characteristics, including their effects on visual function, surgical success rates, and rates of complication. Considering our results, we conclude that both procedures still have significant roles in treatment of RRD. Case selection is the key factor in achieving favorable visual and anatomical outcomes. SB is recommended as the primary procedure in younger patients with



RRD in one quadrant, to avoid the need for cataract surgery and possible chronic macular complications. PPV, especially in combination with cataract surgery, is probably a better option in patients over 50 years of age with larger area of detachment (2 or more quadrants) and longer duration of the RRD.

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