

## Original Article

### Study of managing buckle related complications

**Dr.Sukhwinder Singh ,Dr.Balbir Khan , Dr. Vartika Anand , Dr.Bhavna Sobat ,  
Dr.Manseerat Hans ,Hridhey julka**

1. Dr.Sukhwinder Singh M.S.Ophthalmology Associate professor Gian Sagar medical college and hospital Ram nagar Rajpura 140401
2. Dr.Balbir Khan M.s FVRF FMRF Professor Gian Sagar medical college and Hospital Ram nagar Rajpura 140401
3. Dr. Vartika Anand M.S Professor ,Gian Sagar Medical College And hospital Ram nagar Rajpura 140401
4. Dr.Bhavna Sobat Assistant Professor , Rajindra Medical College And hospital , Patiala
5. Dr.Manseerat Hans Intern ,Rajindra Medical College and Hospital ,Patiala
6. Hridhey julka M.B.B.S student 3<sup>rd</sup> prof.I.G.M.C Shimla

Corresponding Author: Dr. Vartika Anand

#### Abstract:

Background: Scleral buckles have been successfully used to repair rhegmatogenous retinal detachments, Despite stiff competition from pars plana vitrectomy, scleral buckles are not about to retire.

AIM: To describe management of buckle related complications following surgical repair of retinal detachment.

Methods: A retrospective study of 120 patients who had rhegmatogenous retinal detachment who underwent surgery

Results: Of the 120 eyes success rate was achieved in almost all cases with a single procedure however 11 eyes (9%) had recurrent retinal detachment ,buckle related complications included buckle exposure(5%),infection in(5.8%),epiretinal membrane in(4.1%),diplopid(4.1%),elevated intraocular pressure(9%),and macular edema (5.8%) eyes.surgically removal of buckle indicated in (5%) cases .of these the retina remained flat following removal of buckle in all cases.

Conclusion:

There is high rate of buckle related complications following surgical repair of retinal detachment secondary to dialysis.However buckle can be safely removed without compromising the anatomic success of primary surgery in most of the cases.

Keywords: retinal dialysis,buckle,detachment

#### Introduction

Conventional Scleral buckling is still thought to be the most efficacious and cost effective primary procedure for the treatment of uncomplicated rhegmatogenous retinal detachment. This is relatively safe procedure which can be associated with certain complications.

In this study we report the functional and anatomic results of 120 cases of retinal detachment repair over a period of 5 years, and describe the complications relating to the buckle and their management.

### Material and Methods:

All patients who underwent surgical repair of retinal detachment over a period of 5 years are included in this study.

Preoperative data included: Demographic details like age ,sex, preliminary history comprising of symptoms prior ocular surgery if any,visual acuity,nature of trauma(if any),duration of detachment at presentation,macular status(on or Off), location of break, associated any ocular pathology,presence or absence of proliferative vitreoretinopathy.<sup>(table 1)</sup>

Intraoperative data included the type and extent of buckle used,number types of sutures taken,any intraoperative complications if any.

Post operative data included duration of follow up, complications, their management,any second surgery if required .

### Results:

One hundred and twenty eyes (120 eyes) underwent surgery for the repair of rhegmatogenous retinal detachment. The mean age of the patients was 51.67%(range 10yrs-80yrs) years. The male to female ratio was 2:1 .There was history of trauma in 30 eyes of which 14 eyes had a prior history of LASIK while 6 had prior RK done, and 3 eyes had a history of trabeculectomy.<sup>(table 1)</sup>

All primary procedures were performed by one consultant ophthalmic vitreoretinal surgeon. The majority of retinal dialysis were located inferotemporally 66 eyes(55 %),where as 21( 17.5 % ),14( 11.7 % ),and 19(15.8 %) were located superotemporally,inferonasally and superonasally respectively.

The primary procedure comprised of 360 degree periotomy, followed by securing all the muscles sutures with 1-0 silk. Sclera tunnels were made leaving the dialysis site, localisation for dialysis with indirect ophthalmoscope followed by cryotherapy to its posterior edge using indirect ophthalmoscope,Then the buckle was sutured to the sclera with 5/0 polyester ,varying in number 2-3.External drainage of subretinal fluid was done in all cases and paracentesis was done in 10 cases.

The most commonly used buckle type was 279 with 11mm width. Reattachment of retina was achieved with a single procedure in all eyes except 11 eyes (9%), which had multiple breaks in 5 eyes and detachment with proliferative vitreoretinopathy in 6 eyes. However these patients underwent vitrectomy with silicon oil insertion and the retina were attached postoperatively.

Buckle related complications included buckle exposure(6eyes) and buckle related infection(7 eyes) were seen in 13 eyes<sup>(table2)</sup>. Majority of patients presented with pain,redness, discharge. Signs of buckle related complications included exposure of explant 6 eyes(5%) and buckle related infections in 7 eyes(5.8%). Fundoscopy revealed attached retina but pain was continue. On external examination of the eye infection at buckle site was noted so there by buckle removal was done and treated with antibiotics and topical steroids. It was decided to leave conjunctiva open and to treat with systemic and topical antibiotics. One week later site was found to be healthy and so conjunctiva was resutured. Diplopia was seen in 3 eyes(2.5%). Other postoperative complications included epiretinal membrane seen in 5eyes(4.1%) This was later removed when patient underwent phacoemulsification with intraocular lens implantation. Elevated intraocular pressure was noted in 11 eyes(9%), which was managed medically. Macular edema was seen in 7 eyes (5.8%) they were given topical steroids and also posterior subtenon injection was given in 3 eyes.

Removal of buckle was indicated in 6 eyes (5%cases),and the majority of these were removed in first 3 postoperative months. Supplementary prophylactic indirect laser was done prior to removal of buckle performed vitrectomy and intravitreal vancomycin with ceftazidime and dexamethasone given. The average follow up after buckle removal was 10 months. The retina was completely attached .<sup>(table 3)</sup>

The difference in secondary surgical procedure is statistically insignificant at p=.05

**Table 1**  
**Post operative complications and management**

Sr. No	Complications	Number	Management
1	Buckle Exposure	6(5%)	BUKLE EXPLANTATION+VIT+INTRAVIT V+C+D
2	Recurrent RD	11(9%)	VIT WITH SOI
3	Buckle related infections	7(5.8%)	ANTIIBIOTICS
4	Elevated intraocular pressure	11(9%)	MEDICALLY
5	Diplopia/strabismus	3(2.5%)	NEEDED SQ SURGERY
6	Epiretinal membrane	5(4.1%)	REMOVAL AT THE TIME OF PHACO WITH IOL +ERM REMOVAL
7	Eye redness/PAIN	ALL	
8	Refractive Error	ALL	-1.00+/-6.00 SPH WITH -1.00 TO -2.000 SPEC GIVEN
9	Macular edema	7(5.8%)	TOPICAL STEROIDS POST SUB

10	PIGMENT DISPERSIA	3(2.5%)	
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The difference is not statistically significant at  $p=0.05$

**Table 2**

**Secondary surgical procedures following primary repair of retinal detachments.**

Sr. No	Procedure	No of cases
1	Buckle removal	6 (5%)
2	Supplemental ( REC.RD)GAS OIL	11(9%)
3	Resuturing of conjunctiva	0
4	Buckle trimming	0
5	Repeat reattachment surgery	11(9%)
6	Squint Surgery	2(1.6%)

The difference in secondary procedure is statistically insignificant at  $p=0.05$

**Discussion**

A retinal dialysis is a tear in the retina, the anterior edge of which is at the ora serrata and posterior edge of which is attached to vitreous base<sup>1,2,3</sup>. Although retinal dialysis simulates giant retinal tear, yet several notable differences exist between the two. The posterior vitreous detachment is invariably associated with a giant retinal tear, but rarely seen in dialysis. Moreover the vitreous base is attached to the anterior edge of the retina or ciliary epithelium in the eyes with giant retinal tear<sup>2,5,7</sup>. The total number of eyes that presented with giant retinal tear secondary to trauma were 30 in this study. The inferotemporal quadrant was found to be the most commonly affected site found in our study.

The typical treatment for retinal dialysis involves cryotherapy to its posterior edge and placement of a circumferential buckle in an attempt to close the break. Unlike other buckling procedures, the explant used in

the treatment of a retinal dialysis is always circumferential, and is placed at the ora serrata. Also, in order to ensure an indent sufficiently deep to close a retinal dialysis, the surgeon typically endeavours to place very tight sutures for buckle placement.

The primary success rate of retinal reattachment in this study was as high at 91%, with final retinal reattachment achieved in 100%. Indeed, this high rate of success has been noted in previous studies (93–100%).<sup>2,3,4,11</sup>

However, there was a high incidence of buckle-related complications too (34.7%). One of the most common complications of any buckling procedure is recurrent retinal detachment (9%) of eyes, exposure of the explant, with a consequentially increased risk of infection. In our study, buckle extrusion was encountered in six (5%) cases, 7 (5.8%) were associated with infection. However these cases were fully managed by doing vitrectomy and silicon oil insertion. Fortunately, we determined the overall incidence of infection to be low, though it was higher than that found in other studies, 1.5–5.6%.<sup>12,13,14,15,16</sup>

Buckle-related complications severe enough to warrant removal of the explant occurred in 6 (5%) of the total retinal dialysis cases. The most common indication for removal was buckle exposure (5%). One possible explanation for this finding may rest on the fact that a large 5-mm sponge sutured to the ora serata gives rise to a higher rate of symptomatic complications, including diplopia, exposure of explant and ocular pain. However, it should be noted that the risk of buckle-related complications warranting removal following surgical repair of retinal dialysis was high for all forms of retinal dialysis surgery, irrespective of the type of buckle used. There is a much lower incidence of buckle removal reported in the literature in cases of retinal detachment surgery not limited to retinal dialysis cases (1.3–24.4%),<sup>13,14,17,18,19,20</sup> however, reports of surgical repair of retinal dialysis have primarily focused on visual and anatomical outcomes, and have failed to report or discuss buckle-related complications following this procedure.<sup>1,2,3,4,6,7,8,9,11</sup> In other words, it is difficult for us to make any meaningful comment on buckle-related complications following surgical repair of retinal dialysis.

Although removal of a scleral buckle can often be accomplished without much surgical difficulty, there is a risk of retinal redetachment, with reports varying from 3.2 to 34%.<sup>13,14,16,17,18,19,21,22,23</sup> In this study, all the retina were attached post buckle removal, Cases were followed up for an average of 10 months following buckle removal. It has been suggested that 6 months follow-up is adequate to identify cases of retinal detachment following buckle removal, as most cases that redetach will do so during this period,<sup>21,22</sup> with the highest rate of redetachment occurring within the first 30 days.<sup>21</sup>

Risk of retinal redetachment following removal of a scleral explant is reportedly increased in the following instances: relatively short interval between the primary retinal detachment repair and removal of the buckle;<sup>22</sup> the presence of retinal tears, as opposed to holes;<sup>22</sup> if there are no breaks identified at the time of the primary reattachment surgery;<sup>17</sup> the presence of vitreous traction at the time of the initial retinal detachment surgery;<sup>21,22</sup> and greater extent of the original retinal detachment.<sup>21</sup> Retinal dialysis repair, unlike other type of retinal detachment surgery have much lower rate of redetachment following buckle removal.

### **Conclusion:**

To conclude, there is a high rate of buckle-related complications following surgical repair of retinal detachment secondary to retinal dialysis. However, the buckle can be safely removed in the majority of cases, with or without supplementary laser retinopexy. It is possible that the use of a smaller explant may result in a lower incidence of postoperative buckle-related complications, but it has also been shown that the smaller buckle may compromise the surgical success of primary reattachment surgery for retinal dialysis repair.

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