ORIGINAL ARTICLE

Complications of Sub-Retinal Fluid drainage in Scleral Buckling

Sanaullah Jan, Muhammad Zia ud din Khalil, Tariq Shahnam, Ashfaq ur Rahman

ABSTRACT

Objective: To determine safety and efficacy of sub-retinal fluid drainage by cut down technique in sclera buckling surgery.

Study Design: A prospective interventional case series.

Duration and setting of study: This study was performed at department of ophthalmology, Hayatabad Medical Complex, Peshawar, Pakistan from March, 2019 to September, 2019.

Methods: All patients with rhegmatogenous retinal detachment, who were admitted in department of ophthalmology and were due for scleral buckling surgery were included in this study. All cases were operated by a single surgeon (S J) and in all cases sub-retinal fluid was drained by cut down technique (Incisional sclero-choroidotomy). A predesigned proforma was completed for every study case recording preoperative characteristics and intra-operative complications. Post operative retina status and fundus findings were also noted. SPSS version 21 was used for data analysis.

Results: A total of 53 eyes were included in the study. Mean age of the patients was 39 years. Male were 77.4 and female were 22.6%. Proliferative vitreo retinopathy was grade A in 34%, grade B in 64% and grade C in 2% of eyes. Macula was attached in 18.9% of eyes and was detached in 81.1% of cases. No complications were found in 11.3% eyes. The most common intra-operative complication was sub-retinal bleed (9.4%). .

Conclusions: Sub-retinal fluid drainage by cut down technique is relatively safe. The most common complication of SRF drainage is sub-retinal bleed. .

Keywords: Scleral Buckling, Subretinal fluid, Subretinal fluid drainage.

INTRODUCTION

Scleral Buckling (SB) still maintains its position as a standard treatment option for Retinal Detachment (RD) without significant internal traction.[1-3] Most of the complications associated with SB are related to Buckle and Sub Retinal Fluid (SRF) drainage.[4-7] It is reasonable compromise to accept buckle related complications as integral part of SB surgery; however, complications related to SRF drainage can be safely reduced and avoided without affecting surgical outcome of SB surgery. Decision regarding SRF drainage is multi factorial and better to be individualized for every patient. .

Although factors like age of the patient, severity of proliferative vitreoretinopathy (PVR), extent and chronicity of RD, viscosity of SRF, number,type and location of breaks all can influence the decision "to drain or not to drain". However, at times surgeon would see no other option but to drain.

Correspondence
Dr. Tariq Shahnam
Email: tariqshahnam@yahoo.com
H#745, St #21, Sector F9,Phase 6, Hayatabad
Peshawar, Pakistan

Department of Ophthalmology Hayatabad Medical Complex, Peshawar Pakistan

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Some surgeons advocate SRF drainage to reduce Intra-Ocular Pressure (IOP) after buckle placement while others advocate SRF drainage before buckle placement to have ease of indentation and to attain better buckle height. One of the advantages of SRF drainage is that surgeon can be sure of retina status on the table intra-operatively. The satisfaction, the surgeon feels by appreciating the flat retina intra-operatively, can give him good night sleep after surgery and he doesn't have to worry about SRF absorption, which he may have to see on first post operative day or sometimes for many more days after surgery. However, SRF drainage may be a double edge sword and can sometimes give you a lot of unexpected complications.

Complications related to SRF drainage like choroidal bleed, sub retinal bleed, vitreous bleed, iatrogenic breaks, hypotony, hyphema, vitreous and retinal incarceration can have serious implications in relation to surgical outcome. To add insult to the injury, SRF drainage converts SB from extra ocular to intra ocular procedure with inherited risk of

endophthalmitis. Careful examination of detached retina before selecting the drainage site (usually the area where retina is most elevated) and observation of drainage site after draining the SRF should be mandatory, as many of these complications may be dealt or managed intra-operatively.[1] Some of the steps can be adopted for SRF drainage related complications like application of additional buckle and cryopexy for iatrogenic breaks, air or gas or fluid injection to compensate for hypotony or to give support to iatrogenic breaks superiorly or to displace sub-retinal bleed away from macula by advising specific positioning postoperatively. All such measures may be helpful to treat complications.[1] A number of surgical steps and techniques have been suggested to reduce the frequency of SRF drainage related complications. Generally two types of SRF drainage techniques are in practice. Cut down techniques in which two steps approach is used to perform sclerostomy and choroidotomy. Second option is single step technique of performing drainage by making slerostostomy and choroidotomy together as one step. However, careful selection of drainage site, placement of preplaced sutures, technique of sclera-choroidotomy, (use of cautery or laser), avoiding undue pressure on the globe at the time of choroidotomy (in cutdown technique) or by adopting other suggested techniques like suture needle drainage, diathermy needle or using hypodermic needle etc are some of options which are presumed to reduce complications.[8-11] SB is one of the common surgical procedures to treat RD and complications due to SRF drainage are not uncommon. We designed this study to determine the safety and efficacy SRF drainage (cut down technique or Sclerochoroidotomy) in SB surgery for rhegmatogenous RD.

METHODS

It is a prospective interventional case series. This study was performed at Department of Ophthalmology, Hayatabad Medical Complex, Peshawar, Pakistan from March, 2019 to September, 2019. All patients with rhegmatogenous retinal detachment, who were admitted in department of ophthalmology and were due for scleral buckling surgery were included in this study. All cases were operated by single surgeon (S J) and in all cases sub-retinal fluid was drained by cut down technique (Incisional sclero-choroidotomy). Incision site was decided by a surgeon at the time of surgery, cauterized and then incision made with 15 size Bard-Parker blade. Entry was made with 27g needle. A predesigned proforma was completed for every study case. Preoperative characteristics and intra-operative complications were recorded. Post operative retina status and fundus findings were also noted. SPSS version 21 was used for data analysis.

RESULTS

A total of 53 eyes of 53 patients were included in the study. Mean age of the patient was 39 years (39±6). Male patients were 41(77.4 %) and female were 12(22.6%). Proliferative vitreo retinopathy was grade A in 34 %(n=18) of patients, grade B in 64 %(n=34) of patients and grade C in 2 % (n=1). Macula was attached in 10 (18.9%) of eyes and it was detached in 43(81.10%) of the eyes preoperatively. After sub-retinal fluid drainage, hypotony was noted in eyes which were managed by injection of air, fluid or gas into vitreous. No complications were found in 47(88.7%) of the eyes. In 6 (11.3%) eyes complications were seen. The most common intra-operative complication was sub-retinal bleed in 5 (9.4%) eyes.

Table 1: Complications of SRF drainage (n=53)

Complications	Frequency (n)	Percentage (%)
Sub-retinal bleed	5	9.4%
Vitreous bleed	0	0
Choroidal bleed	0	0
Vitreous incarceration + Retinal incarceration + Iatrogenic Retinal tear	1	1.9%
No complications	47	88.7%
Total	53	100%

n=number, += Plus, % = Percentage

DISCUSSION

The decision to or not to drain sub-retinal fluid is debatable and most of the time decision rests on surgeon`s preferences and judgment. In cases where there are no clear cut indications for the drainage of sub-retinal fluid, non-drainage technique is as effective as the drainage technique.[12] On the other hand drainage of the sub-retinal fluid achieves better anatomical restoration and the complications which occur do not affect the end result of the surgery.[13] Sub-retinal fluid can be drained by various techniques. The most commonly used techniques are incisional sclerochoroidotomy, needle drainage technique, laser assisted drainage of the sub-retinal fluid and modified needle drainage technique.[14] We used the conventional incisional sclerochoroidotomy in our study cases. The complications rate of the different surgical techniques for sub-retinal fluid drainage varies from study to study. In a randomized clinical trial the complications score was higher in the drainage group but it did not decrease the final visual and anatomical outcome.[12] According to Schepens, if the drainage is performed correctly the complications rate is less than 1%.[15] In another study conducted by Wilkinson and Bradford reported complication rate of 5.6%.[13] The complication rates were compared in conventional cut down versus modified needle drainage in a study conducted by Azad et al.[16] They found out that the complications rate was 15% in modified needle drainage and 32.5% in cut down method.[16] We employed incisional sclerochoroidotomy in our study and the complications rate was 11.3%. The most common complication in our study was sub retinal hemorrhage (9.4%) as compared to other studies (3%[13], 8%[17] and 12%[18]). In a study conducted by Raymond et al, the sub-retinal hemorrhage occurred in 12% of cases. In their study, drainage of sub-retinal fluid was performed by the needle method.[19] We had one case of retinal incarceration (1.9%) in which there was iatrogenic tear formation similar to a previous report (2%).[13] The case was then converted to pars plana vitrectomy. This complication can be prevented by draining the sub-retinal fluid in the most dependent area, releasing pressure or traction on the globe at the time of choroidotomy and constant monitoring with indirect ophthlmoscope.

Although complications occur with sub-retinal fluid drainage using cut down technique (incisional sclero-choroidotomy), it is still regarded as a safe procedure. In our study the confounding factors for the increased risk of complications were not pin pointed. The sample size of our study is not large enough to generalize the results however, the complications rate were comparable to other studies. A large randomized controlled trial is warranted to know about the safety and efficacy of sub-retinal fluid by cut down technique (incisional sclera-choroidotomy).

CONCLUSIONS

Sub-retinal fluid drainage by cut down technique is relatively safe and effective in scleral buckling surgery. The most common complication of SRF drainage is sub-retinal bleed.

REFERENCES

1. Soni C, Hainsworth DP, Almony A. Surgical management of rhegmatogenous retinal detachment: a meta-analysis of randomized controlled trials. Ophthalmology 2013; 120(7):1440-7. .

2. Adelman RA, Parnes AJ, Sipperley JO, Ducournau D. European Vitreo-Retinal Society (EVRS) Retinal Detachment Study Group. Strategy for the Management of Complex Retinal Detachments: The European Vitreo-Retinal Society Retinal Detachment Study Report 2. Ophthalmology 2013; 120(9):1809-13.

3. Adelman RA, Parnes AJ, Ducournau D. European Vitreo-Retinal Society (EVRS) Retinal Detachment Study Group. Strategy for the Management of Uncomplicated Retinal Detachments: The European Vitreo-Retinal Society Retinal Detachment Study Report 1. Ophthalmology. 2013; 120(9):1804-8.

4. Tsui I. Scleral Buckle Removal: Indications and Outcomes. Surv Ophthalmol. 2012; 57(3):253-63.

5. Wirostko WJ, Covert DJ, Han DP, Connor TB, Kim JE, Hammersley J. et al. Microbiological spectrum of organisms isolated from explanted scleral buckles. Ophthalmic Surg Lasers Imaging. 2009; 40(2):201-2.

6. Abdullah AS, Jan S, Qureshi MS, Khan MT, Khan MD. Complications of conventional scleral buckling occuring during and after treatment of rhegmatogenous retinal detachment. J Coll Physicians Surg Pak 2010; 20(5):321-6.

7). Jan S, Iqbal A, Saeed N, Ishaq A, Khan MD. Conventional retinal reattachment surgery. J Coll Physicians Surg Pak 2004; 14(8):470-3.

8. Freeman HM, Schepens CL. Innovations in the technique for drainage of subretinal fluid, transillumination and choroidal diathermy. Mod Probl Ophthalmol 1975; 15:119-26.

9. Saran BR, Brucker AJ, Maquire AM. Drainage of subretinal fluid in retinal detachment surgery with El-Mofty insulated diathermy electrode. Retina 1994; 14(4):344-7.

10. Raymond GL, Lavin MJ, Dodd CL, McLeod D. Suture needle drainage of subretinal fluid. Br J Ophthalmol 1993; 77(7):428-9.

11. Meyer-Schwickerath G, Klein M. Drainage of subretinal fluid with cathode needle. Mod Probl Ophthalmol 1975; 15:154-7

12. Hilton GF. The drainage of subretinal fluid: a randomized controlled clinical trial. Trans Am Ophthalmol Soc 1981; 79:517-40.

13. Wilkinson CP, Bradford Jr RH. Complications of draining subretinal fluid. Retina 1984; 4(1):1-4.

14. Ryan EH, Arribas NP, Olk RJ, Grand MG, Boniuk I. External argon laser drainage of subretinal fluid using the endolaser probe. Retina 1991; 11(2):214-8.

15. Schepens CL. How should retinal breaks be closed. Controversy in Ophthalmology. Philadelphia: WB Saunders; 1977:566-81.

16. Azad R, Kumar A, Sharma YR. Modified needle drainage. A safe and efficient technique of subretinal fluid drainage in scleral buckling procedure. Indian J ophthalmol 2004; 52(3):211-4.

17**.** Wong D, Chignell AH, Inglesby DV, Little BC, Franks W. The treatment of bullous rhegmatogenous retinal detachment. Graefes Arch Clin Exp Ophthalmol 1992; 230(3):218-20.

18. Burton RL, Cairns JD, Campbell WG, Heriot WJ, Heinze JB. Needle drainage of subretinal fluid: A randomised clinical trial. Retina 1992; 13(1):13-6. .

19. Raymond GL, Lavin MJ, Dodd CL, McLeod D. Suture needle drainage of subretinal fluid. Br J Ophthalmol 1993; 77(7):428-9