PNEUMATIC RETINOPEXY IN RHEGMATOGENOUS RETINAL DETACHMENT

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ABSTRACT

Existing surgical modes for retinal detachment are elaborate and extremely complex. We have treated 20 cases of rhegmatogenous retinal detachment with pneumatic retinopexy which is less time consuming and does not require hospitalization. After pneumatic retinopexy reattachment of retina was achieved in 15 (75%) eyes. In 2 eyes retinal reattachment was achieved after repeating intravitreal injection of sulphur hexafluoride gas. Remaining 3 eyes were secondarily treated with scleral buckle surgery. One case needed vitreoretinal surgery. In pneumatic retinopexy there is minimum tissue handling and functional results are good.

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KEYWORDS: Retinal detachment; Sulphur hexafluoride; Vitreo retinopathy.

Introduction

Pneumatic retinopexy is a nonincisional operation used to treat rhegmatogenous retinal detachment. This is a two-step procedure involving cryo-application to retinal holes and degenerative lesions and intravitreal injection of an expanding long-acting gas. This technique achieves a success rate comparable to that of scleral buckel surgery with less post-operative morbidity and better final visual acuity.

We treated 20 cases of retinal detachment having single or multiple tears in less than three clock hours area in upper 2/3 rd of retina by using sulphur hexafluoride gas (SF₆). We avoided prolonged surgical exposure by eliminating scleral buckling. In India Elhence Arun in 1994 treated 30 cases of retinal detachment with pneumatic retinopexy and found an overall success of 83 per cent [1]. In Armed Forces Medical Services this procedure has not been reported so far.

Materials and Methods

The study was conducted on 20 patients seen at civil eye out patient department of Armed Forces Medical College between December 1994 and August 1995. All patients had superior rhegmatogenous

retinal detachment (defined as detachment with retinal breaks between 8 o'clock and 4 o'clock in the periphery) in one eye. A detailed ocular examination of both eyes was done with the help of indirect ophthalmoscopy and detailed retinal drawings were made on standard retinal charts. Patients with glaucoma and proliferative vitreoretinopathy of more than grade C1 (full thickness folds in more than one quadrant of retina) were excluded from the study.

Operative Procedure

Informed consent was obtained in all cases. Patient was held in supine position with head rolled approximately on contralateral side so the temporal pars plana was uppermost. Topical anaesthesia was achieved by using 4 per cent xylocaine and facial and retrobulbar block by using 2 per cent xylocaine. The external globe and fornices were sterilized with 5 per cent betadine solution and irrigated with ringer lactate solution. Trans-conjunctival cryopexy was done around retinal breaks and degenerative lesions under visualization through indirect ophthalmoscope.

A sterile lid speculum was inserted. SF₆ gas was transferred from a high pressure cylinder to a

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small 2 mL syringe by using a millipore 0.22 µ filter (which can filter fine particles, bacteria and viruses). Injection was made with a 30 gauge needle (12 mm in length) at pars plana with needle directed towards the mid-vitreous. Needle was inserted in the eye to depth of 6-7 mm and subsequently withdrawn by 2-3 mm so that 2-3 mm of the needle tip was within the eye and 9 mm of the shaft was outside the eye. The needle tip was viewed with the indirect ophthalmoscope during injection. Thereafter 0.6 mL of gas was injected in a moderately brisk manner and a single large bubble was usually achieved.

In all patients paracentesis of the anterior chamber was performed with a 30 gauge needle inserted at the limbus before injecting gas. In patients with open or no posterior capsule, paracentesis was performed before intravitreal injection through pars plana. Good perfusion of optic nerve head was ensured in all patients. Patients were instructed to position their heads so that retinal breaks were uppermost in location. Patients were asked to maintain that position all day and night (except for meals and going to toilet) for a minimum of 5 days. Subsequently they were advised to keep that position as far as possible till the disappearance of bubble. Post-operatively patients were followed on first, fifth, fifteenth post-operative days, monthly for 3 months and then every 3 months for a minimum of 6 months. On each visit intraocular pressure was checked, retina was examined, any post-operative complications noted and managed. Patients in whom retinal detachment did not settle with this procedure underwent either a repeat pneumoretinopexy or scleral buckling.

Results

A total of 20 cases of rhegmatogenous retinal detachment with single or multiple tears in less than three clock hours in upper 2/3 rd of retina were treated with pneumatic retinopexy. Thirteen patients were males and 7 were females. Age of patients ranged from 36 years to 75 years. Right eye was involved in 12 cases and left eye in 8 cases. Nine eyes were phakic and 7 were aphakic. Out of 4 pseudophakic eyes 3 had open posterior capsule. Patients had reported to hospital for treatment within a period of 1 to 12 weeks after developing retinal detachment.

Maximum number of patients treated in our series had retinal detachment extending 7-8 clock hours (Table 1). Two patients had total rhegmatogenous retinal detachment. Retinal detachment involved the macula in 12 cases.

TABLE 1
Extent of retinal detachment in 20 eyes

Extent of retinal detachment (clock hour)	No of patients	Percentage
1-2	1	5
3-4	5	25
5-6	4	20
7-8	7	35
9-10	1	5
11-12	2	10

TABLE 2
Number of retinal tears in 20 eyes

No of tears	No of patients	Percentage
1	11	55
2	6	30
3	1	5
4	2	10

Fifty five per cent patients had a single tear (Table 2). In 85 per cent patients tears were present within one clock hour area. All tears were located in upper 2/3 rd of retina extending from 8 o'clock to 4 o'clock.

Visual acuity improved by at least two Snellen lines in 13 eyes (65%) and remained almost same (within two Snellen line) in 6 eyes (30%) (Table 3). In one eye visual acuity worsened from counting finger before surgery to PL and PR after surgery.

Retinal reattachment was achieved by a single pneumatic retinopexy procedure in 15 (75%) cases. In 12 cases retina got reattached on second or third post-operative day. In remaining 3 cases it got reattached in 7-10 days time. Repeat cryopexy and gas injection was necessary in 2 cases (10%) because of new retinal tear detection after 2 weeks. Second pneumatic retinopexy procedure was successful.

TABLE 3
Pre operative and post operative visual acuity in 20 patients

Visual acuity	No of cases (pre op)	No of cases (post op)
PL, PR only	0	1
HM perception	4	0
CF close to face	1	0
Upto		
3/60	7	0
3/60 to 6/60	3	4
6/60 to 6/24	2	5
6/24 to 6/18	0	4
6/18 to 6/6	3	6

In one case poor patient compliance resulted in persistent retinal detachment and scleral buckle surgery was performed. In another case new retinal tear developed inferiorly and caused a new retinal detachment requiring scleral buckle surgery. In one case retinal detachment persisted after pneumatic retinopexy and proliferative vitreo retinopathy (PVR) was also found to be increased in grade C2. This case underwent vitreoretinal surgery.

The success rate (90%) of pneumatic retinopexy in phakic cases out of those with intact posterior capsule was a little higher compared to that (80%) in aphakic eyes and pseudophakic eyes with open posterior capsule. Overall retinal reattachment rate in all 20 eyes was 85 per cent for pneumatic retinopexy and 95 per cent for pneumatic retinopexy and scleral buckle.

There was acute rise of intraocular pressure causing central retinal artery occlusion in 7 cases (35%) just after injection. Immediately another paracentesis was performed at the limbus 180 degrees from the previous paracentesis site. Good perfusion of the optic nerve head was achieved in all patients. Post-operative examination did not reveal any significant rise in intraocular pressure. Post-operative intraocular inflammation was minimal. There was no case of post-operative viteritis or endophthalmitis. Intra-vitreous gas bubble got absorbed within 8-12 days in most of the cases and within 14 days in all cases. Four cases (20%) developed subconjunctival gas bubble. It did not cause any problem and disappeared spontaneously in 1-2 days.

Discussion

In 1986 Hilton and Grizzard introduced the term 'Pneumatic retinopexy' and described the technique of gas injection and cryopexy or laser photo-coagulation for repairing retinal detachment [2]. Since then this procedure has been practised by many workers in the West [3-6]. In India very little work has been done in the last few years [1,7].

In cases of pneumoretinopexy gas bubble rises up and occludes the retinal break, hence pneumoretinopexy has been done only in those cases of rhegmatogenous retinal detachment having retinal holes in upper two third of retina i.e., from 8 o'clock to 4 o'clock. A gas bubble can't be effective if the holes are too far apart, hence we attempted pneumoretinopexy in patients with multiple holes only when all holes were within a 3 clock hours contiguous area. We did not attempt this procedure in cases having PVR more than C1 grade.

As SF₆ causes increase in intraocular pressure post-operatively hence patients having glaucoma were also not treated by pneumoretinopexy. Pneumoretinopexy has certainly got advantage over routine scleral buckling procedures in being less expensive and requiring no hospitalization. Operative procedure is very short, less traumatising and visual results are better. In selected cases results are quite good and comparable to buckle surgery. In this series we achieved retinal reattachment in 85 per cent cases by pneumoretinopexy, in 75 per cent cases by first pneumoretinopexy and in 10 per cent cases by repeat pneumoretinopexy. This is comparable to buckle surgery results which also vary from 80-90 per cent [8]. Our results are a little less successful than Brinton and Hilton [9] who achieved success in 81 per cent cases by one pneumoretinopexy and 97 per cent cases by repeat pneumoretinopexy.

Pneumatic retinopexy should only be practised by ophthalmologists skilled in indirect ophthalmoscopy. Ophthalmologists who have inadequate experience in indirect ophthalmoscopy, may not be able to select cases properly, may not be able to do retinopexy around retinal lesions accurately and hence prognosis may be poor. In brief, this procedure if done in selected cases of retinal

detachment, can be economical, safe and give better visual results.

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Drug Toxicity Bulletin

PULMONARY TOXICITY CAUSED BY AN ANTI ARRHYTHMIC AGENT

Amiodarone is an effective antiarrhythmic drug. Nowadays, it is mostly used to treat patients with severe cardiomyopathy or coronary artery disease complicated by disturbances in the supraventricular or ventricular rhythm.

The clinical features of amiodarone pulmonary toxicity may not be recognised immediately, and even when suspected the diagnosis is often difficult to establish in patients with cardiomyopathy or serious coronary artery disease. Patients who have developed "amiodarone lung" usually present with non specific symptoms such as cough, dyspnoea, fever and loss of weight. The features of amiodarone pulmonary toxicity may emerge only after the underlying cardiac or pulmonary disease has been treated, and this delay may increase the risk of fatal course.

Doctors often assume that pulmonary toxicity

occurs only when high doses of amiodarone are used for a long time but recently, it has been shown that a low maintenance dose (<300mg) may also be toxic.

Once amiodarone toxicity has been detected several options are available. First, treatment may be stopped and suitable substitute be added to the treatment. Secondly, it may be withheld for several days and then dose be reduced to lowest effective level. Thirdly, consider non pharmacological choice i.e. radio frequency ablation of the causative re-entry mechanism or implantation of an automatic cardioverter defibrillator.

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