ORIGINAL ARTICLE

Management of Complicated Retinal Detachment by using Silicone Oil as a Tool

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ABSTRACT

Aim: To study the efficacy of liquid silicone to be used as an instrument in the primary procedure to elevate membranes from the detached retina so that the traction over the retina is relieved and retina goes onto its bed.

Methods: Patients selected for this study were those who presented with complicated retinal detachment in outpatient department of Ophthalmology, BV Hospital Bahawalpur. The patients came directly were refereed from remote areas.

Results: The study was carried out from May, 2016 to July, 2016.During this period, 30 eye patients with retinal detachment were operated. The average age was 40 years (ranges from 10-73 years).Average duration of decreased vision in the effected eye was 25 days (ranging from 10-60 days).Pre operative visual aquity ranged from faulty projections to counting fingers. The cases with faulty projections were considered for surgery due to blindness in other eye. Two groups of patients were formed depending upon different surgical techniques.

Conclusions: Incidence of PVD is more in aphaik retinal detachments than phakic retinal detachment. Before proceeding for surgery, thorough clinical examination is mandatory especially dynamic vitreous retinal study. Patients should be briefed about prognosis. Liquid Silicone can be used as surgical tool to manage complicated retinal detachment Using liquid silicone as surgical tool depends upon the elasticity differential between the PVR membranes and retina.

Keywords: PVD - Posterior Vitreous Detachment, RPE - Retinal Pigment Epithelium, RTF - Retinal Tear Formation, PVR - Proliferative Vitreous Retinopathy,

INTRODUCTION

Retinal detachment occurs when the fluid accumulates between the neuro sensory retina and retinal pigment epithelium. It has to be differentiated from the conditions as retinoschises and choroidal detachment. In these conditions retina is elevated but not separated from the underlying pigment epithelium. There are three major types of retinal detachment depending upon there pathogenitic mechanism:

1. Rhematogeniuos retinal detachment
2. Exudative retinal detachment
3. Tractional retinal detachment

(Young j. lucky and D'Amico J., 1994)

The most common is Rhematogeniuos retinal detachment in which fluid from the vitreous cavity enters the potential sub-retinal space through a break into the retina. This fluid separates the neuro-sensory retina from RPE. Retina is characteristically corrugated or bullous and is convex towards the pupil.

The second most common type is the tractional retinal detachment. The detachments are caused by the vitreo-retinal fibro proliferative membranes that mechanically pull the retina away from RPE. The detached retina is typically smooth and concave towards anterior segment. Tractional retinal detachment is usually more confined and rarely extends towards Ora Serrata. Traction over the retina can cause tear in the retina thus resulting in tractional-Rhegmatogenous retinal detachment.

Third type is exudative retinal detachment. This group includes detachment caused by the choroidal or retina conditions which disturb the pigment epithelium or blood retinal barrier allowing the fluid to build up in sub retinal space. Shifting fluid is the characteristics of such detachment. It is crucial to distinguish between different types of detachment as management of each type is different.

Retinal Tear Formation: Normally during the rational eye moments vitreous moves with a short delay due to inertia (during this time relative opposite movement of the vitreous takes place). Then a rapid following moments of the vitreous start in the direction of the eye movement lasting for two seconds. Vitreous movement stop with the jerk due to decelerating force. Due to this a tractional force is applied at appoint of attachments of the vitreous which can cause retinal tear formation . Thus a settling phase

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(after movement phase) follows lasting about 7-15 seconds (Hildings, 1971)

When posterior vitreous gets detached this phenomenon is exaggerated. Vitreous moves with considerable freedom and retinal tear formation is more likely. It produces a horse shoe shape tear or an operculated round hole. This retinal tear relieves the tractional force on operculated hole while the tractional persists on the flap of horse shoe tear. The dynamic traction may increase the size of the tear. An eye with PVD without retinal break is at risk to get retinal break at any time during day to day eye movements. Due to PVD retinal breaks are usually present superiorly because of gravitational force while inferior tear are produced due to sudden stop of vitreous with jerk during eye moments or inertia of fluid vitreous at the start of the movement (Thompson , 1993). Such tear caused slow retinal detachment because tear are covered by vitreous gel(Scott, 1972, Chingnell 1988). Incidence of retinal tear in the PVD is 15% (Kroll, 1994) to 74% (Kanski, 1975) and upto 94% of the retinal break are superior (Seabag, 1992). In contrast to retinal break round retinal hole most frequently result from localize degenerative or atrophic changes in the retina (Chignell, 1988, Peyman, 1994).

Process of Retinal Detachment: In the detachment of posterior vitreous, vitreous collapses down and creates traction on the area of strong adhesion if the traction is strong enough it tear the retina either U shaped or round hole with operculam. Retinal tear are also formed due to dyanamic vitreous tractional during rotational eye moments retinal tear is complimented by the forces of fluid current. Liquefied vitreous moved rapidly due to decrease viscosity.

Due to inertia vitreous moved in opposite direction initially. This liquefied vitreous creates an eddy current around the retinal tear force of current act against the edges of retinal break and elevate the retina from its bed (Thompson, 1993). Eddy force depends upon the size of the tear larger the tear greater will be the effect once the edge of the retinal tear elevates from its bed fluid current directly approaches into sub retinal space which further elevates the retina liquefied vitreous may shift into sub retinal space and produce retinal detachment.PVD leads to retinal detachment in 54% of the cases (Adhi 1996).

Force of fluid currents during rotational eyes not only act on the edges of the tear but also on the vitreous stand adherent to the flap of U shaped tear this rises the flap of tear exposing its edges due to this process of detachment exaggerates (Thompson 1993) Peyman 1994 , Kroll 1994, Machmer 1984.

Importance of fluid current in causing retinal detachment is more event with superior retinal tear compared to retinal dialysis or inferior retinal breaks. In these cases retinal tear are covered by vitreous gel. Vitreous gel saves the retinal tear from exposing to the fluid currents. This is the reason that retinal detachment process is very slow in the later condition. Rate of progression of retinal detachment is rapid in the presence of incomplete PVDas compared into undetached vitreous gel (Chignall 1988).

METHODOLOGY

Patients selected for this study were those who presented with complicated retinal detachment in outpatient department of Ophthalmology, BV Hospital Bahawalpur. The patients came directly were refereed from remote areas. Those patients who presented with tractional retinal detachment due to proliferative diabetic retinopathy, exduative retinal detachment, were excluded from the study. The patients with retinal detachment associated with massive vitreous hemorrhage were also excluded from the study.

Patients were thoroughly evaluated before surgical procedure by taking history, general physical examination, visual aquity recording, intraocular pressure, slit lamp examination, distant direct ophthalmoscopy, fundus examination, vitreo-retinal drawing, and Ultrasound (B-Scan) examination.

RESULTS

The study was carried out from May, 2016 to July, 2016.During this period, 30 eye patients with retinal detachment were operated. The average age was 40 years (ranges from 10-73 years). Average duration of decreased vision in the effected eye was 25 days (ranging from 10-60 days). Pre operative visual aquity ranged from faulty projections to counting fingers. The cases with faulty projections were considered for surgery due to blindness in other eye. Two groups of patients were formed depending upon different surgical techniques. Those who have PVD were placed in group A and had no PVD were placed in group B:-

Table 1:

Description	Total	Phakic	Aphakic
PVD	16(53.3%)	03(10%)	13(43%)
No PVD	14(46.66%)	09(30%)	5(17%)

Grouping on the Basis of Presence of PVD: Total numbers of patients in Group A was 16(53.33%). Out of these 3(10%) were phakic and 13(43%) were aphakic. Total numbers of patients in Group B was 14 (46.6 %). Out of these, nine (30%) were phakic and 5 (17 %) were aphakic.

Table 2:

Age of Patients	n	%age
< 30 years	9	30
31-50 years	6	20
51-70 years	12	40
>70 years	3	10

Age distribution: Age ranges from 10 to 73 years. Average age 40-45 years with minimum number of pts belonging to age more than 70 yrs were 3(10%).

Table 3:

Visual Acuity	n	%age
PL & PL faulty	03	10
PL R & PL good	15	50
HM +ve	03	10
CF	09	30

Table 4:

Shape	n	Site	
		Superior	Inferior
H.S.S	14(48%)	8	6
Round	03(10%)	2	1
Mixed	06(20%)	4	2
GRT	03(10%)	1	1
No Hole	04(14%)		

Table 5

Type of PVR	n	%age
Grade A & B	-	-
Grade Cp1	5	16.66
Cp11	14	46.66
Cp111	4	13.33
CA 1v	7	23.33
CA v	-	-

Table 6: Group A (16 Cases)

Description	n	%age
Completer Retinal Reattachment	10	62.5
Partial Retinal Reattachment	4	25
No Retinal Reattachment	2	12.5

Table 7: Group B (Cases)

Description	n	%age
Completer Retinal Reattachment	7	50
Partial Retinal Reattachment	5	35
No Retinal Reattachment	2	15

DISCUSSION

Study comprised of 30 cases. These were divided into two groups. Group A consists of 16 patients (53.3%) having detached posterior hyaloids. Group B comprised of 14(46.7%) patients. The patients in Group B were not having PVD. As to post operative visual acuity, even after complete anatomical reattachment of the retina, visual acuity ranged from counting fingers to 6/36. Visual acuity of 4/60 to 6/36 in 12 patients during 3-6 months follows up time. In 5 patients shallow inferior detachment persisted. Two of these cases ended in phthsis bulbi. So the patient with retinal detachment should be operated as early as possible. Long duration of detachment prevents the normal nutrition to the neuro sensory retina and visual rehabilitation even after successful anatomical reattachment is not good.

CONCLUSIONS & RECOMMENDATIONS

- Incidence of PVD is more in aphaik retinal detachments than phakic retinal detachment.
- Before proceeding for surgery, thorough clinical examination is mandatory especially dynamic vitreous retinal study.
- Patients should be briefed about prognosis.
- Liquid Silicone can be used as surgical tool to manage complicated retinal detachment.
- Using liquid silicone as surgical tool depends upon the elasticity differential between the PVR membranes and retina.
- In the cases of PVD, a very meticulous surgery is needed to save the PHM as the oil is injected behind PHM.
- Post operative care should be taken that there should be single large bubble.
- Emulsification of silicone oil can be reduced with optimum fill of the vitreous cavity.
- Silicone oil kertaopathy is prevented if oil is in single bubble form.
- Secondary glaucoma due to liquid silicone does not occur if the inferior iridectomy is patent and working in aphakics.

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