Original Article

Outcome of Macular Hole Surgery at Mayo Hospital, Lahore

Nadeem Ahmad, Syed Raza Ali Shah, Qasim Lateef Ch, M. Younis Tahir, Tehseen Mehmood Mahju, Ch Nasir Ahmed, Muhammad Arif, Sohail Sarwar, Anwar-ul-Haq, Asad Aslam Khan

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See end of article for authors affiliations

Correspondence to:
Nadeem Ahmad
Vitreo-retina Fellow
COAVS, Lahore

Purpose. To evaluate the anatomic and visual out come in patients undergoing pars plana vitrectomy (PPV) with internal limiting membrane (ILM) peel for idiopathic macular hole.

Material and Methods. Fifteen cases of full thickness macular hole were selected and underwent PPV with ILM peeling and 20% sulphar hexafluoride gas (SF6) as internal tamponade.

Results. Out of 15 cases 13 (86.7%) patients achieved anatomical success and in 2 cases the macular remained open. The visual acuity in 6 cases (40%) improved by 2 or more lines.

Conclusion. PPV with ILM peel is associated with significant anatomical and functional improvement.

Macular hole is an important cause of central visual loss and the overall prevalence is approximately 3.3 per 1000[1]. Macular hole can be associated with trauma or myopia but most common cause is idiopathic. Idiopathic macular hole are commonly seen in women in the seventh decade of life without any apparent predisposing conditions[2]. Kelly and Wendel introduced a surgical procedure to close macular holes. They achieved an anatomical closure rate of 73% and visual improvement of two or more lines[3]. During the last decade closure rates have improved significantly due to improved surgical techniques[4]. Brooks has shown significant improvement in anatomical and functional outcome after MACULAR HOLE surgery[5]. Gupta B and colleagues had the anatomical success rate of 86% and variable visual success rate.[6] Brooks reported 100% closure in holes of less than 6 months duration with ILM peeling[7]. The purpose of study was to see the anatomical and visual results in our circumstances.

MATERIAL AND METHODS

Study Design: Non comparative interventional case series.

The study was conducted at College of Ophthalmology & Allied Vision Sciences, Mayo Hospital Lahore. One year study started from June 2010 to May 2011. Fifteen cases of stage 2, 3 and 4 Idiopathic macular hole were included.

Patients having pseudomacular hole, stage I macular hole, macular cyst and secondary macular hole were excluded from the study. All patients after enrollment from outpatient department of Mayo Hospital Lahore were admitted for surgery. Detailed history including the age, sex and duration of symptoms were noted. Best-corrected visual acuity (BCVA) was recorded. Detailed anterior segment and fundus examination was performed. Stage and size of the macular hole was noted with the help of Optical coherent tomograph (OCT) [Optovue]. All patients underwent 20 gauge PPV with ILM peeling with or without staining and 20% Sulphar hexafluoride (SF6) gas as internal temponade under local anesthesia. In two cases brilliant peel (0.025%) was used under air to stain ILM and in remaining cases triamcinolone was sprinkled over it. Triamcinolone does not stain the ILM but gives a good contrast as the peeled area lacks the white particles. One to one half disc area of ILM was peeled in a circular fashion around the macular

hole. Non expansible concentration (20%) of SF6 was prepared by taking 4ml of pure gas mixed with 16ml of sterile air in 20ml syringe. All patients were instructed to position face down for one week. The patients were reviewed on post op day 1, week 1, 4 and 12. On follow up visits again history, BCVA, intraocular pressure (IOP), and dilated fundus examination were performed. At week 4 and 12 OCT images were also taken to establish the closure of macular hole.

Outcome Measures: The primary outcome measure was to achieve successful anatomically closure of macular hole which was defined as closure of the edges of the hole. The secondary outcome was to gain improvement in BCVA.

Table 1. Base line characteristics of Macular Hole patients

Age in yrs	Mean 57.8 Range 50 – 70
Sex	Male 06 (40%) Female 09 (60%)
Eye	Right 09 (60%) Left 04 (26.6%) Both 02 (13.3%)
Duration of symptoms	$\leq$ 6 mo 08 (53.33%) $\geq$ 6mo 07 (46.66%)
Pre op BCVA • 6/60 • 6/36 • CF	 10 (66.66%) 02 (13.3%) 03 (20%)
Stage of Macular Hole • Stage 2 • Stage 3 • Stage 4	 0 01 (6.66%) 14 (93.33%)
Lens status • Phakic • Pseudophakic	 13 (86.66%) 02 (13.3%)

RESULTS

Fifteen cases of full thickness macular holes underwent surgery at retina clinic of Mayo hospital Lahore from June 2010 to May 2011. Baseline characteristics of these patients are presented in Table 1. The mean age of patients was 57.8 $\pm$ 5.8 years. Both eyes were involved in 13.3% of cases and 53.3% of cases have 6 month or less duration of symptoms. Pre op BCVA in 66.7% cases were 6/60 and 93.3% cases had stage 4 macular hole on OCT. 86.7% cases were phakic with grade II nuclear sclerotic changes.

Outcome measures are presented in table 2. Out of 15 cases 13 achieved closure of macular hole which were confirmed on OCT. Snellen visual acuity before surgery was 6/60 in 10 (66.7%), 6/36 in 02 (13.3%) and CF in 03cases (20%). Improvement of 2 or more lines occurs in 40% of cases and one line improved in one case (6.66%).

During surgical procedure no significant complication occurred. In the follow up period, IOP rise was not found in any case which was defined as IOP rise > 30mmHg. One case developed significant cataract due to improper posture. Two holes remained open and one case developed hypotony on first post op day.

Table 2. Out come measures of Macular hole surgery

Hole status based on OCT • Closed • Not closed	 13 (86.66%) 02 (13.3%)
Post op BCVA • 6/60 • 6/36 • 6/24 • 6/18 • CF	 06 (40%) 01 (13.3%) 04 (26.6%) 02 (13.3%) 02 (13.3%)

DISCUSSION

The anatomical success rate for this study was 86.7%, which is equal to the similar studies from the other centers[8,9]. The two holes remained open despite of surgery. The redo surgery was planned but patients did not report back. Some times more than one surgery is required to achieve the anatomical success[10]. One case developed hypotony on post op day 1, the most likely cause was wound leak. 0.3 ml of pure gas was injected into vitreous cavity under topical anesthesia. Next day the IOP was 18 mmHg and remained under control during follow up. These problems can be avoided by ensuring the proper closure of all the vitrectomy ports. Rhegmatogenous retinal detachment occurred in one case after one month. This complication may occur in 1% to 2% of cases undergoing macular hole surgery[11]. This case was successfully managed with laser retinopexy and intravitreal gas temponade due to the presence of superior break. One patient develop significant

cataract due to improper posture and underwent phacoemulsification with intraocular lens implantation. We did not combine phacoemulsification with macular hole surgery because in a large randomised trial of posturing for macular hole, patients who had combined surgery did not have a higher success rate than those who had vitrectomy alone[12]. Another reason is that biometry may be less accurate due to presence of macular disease and anterior displacement of the capsular bag caused by the gas bubble may cause slight myopic shift[13].

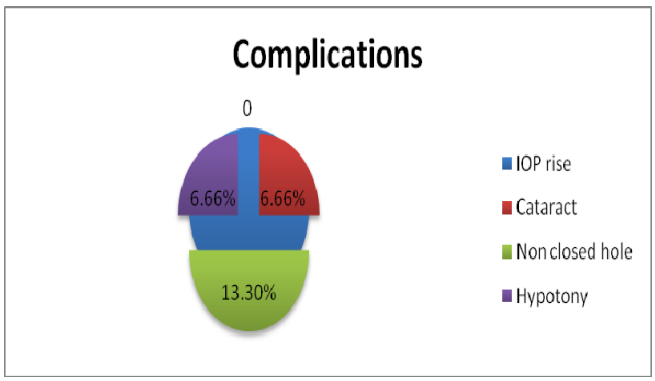

Fig. 1: Showing Complications

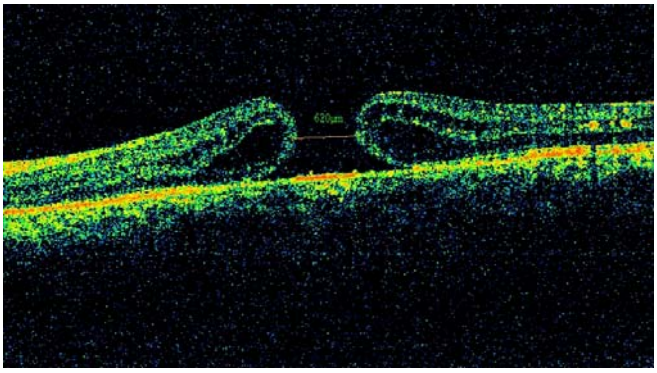

Fig. 2: Showing Preoperative OCT of Macular Hole

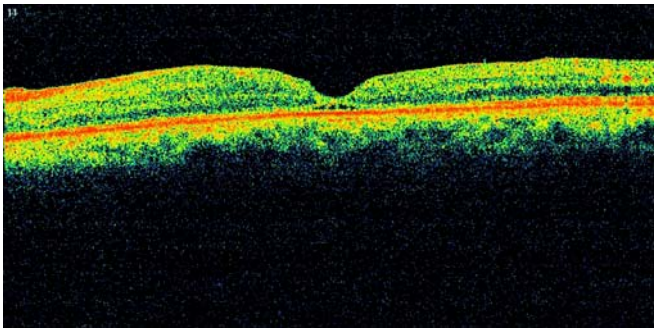

Fig. 3: 3 months postoperative OCT of same patient

In addition to determining the anatomical success, visual outcomes must be examined. Visual success, defined as an acuity of 6/18 or better. In our study the visual success was 13.3% although 6 cases improved by 2 lines and one case by one line. The diameter of the macular hole provides a prognostic factor for postoperative visual outcome. Freeman and coworkers found that a macular hole with a small diameter was associated with better functional outcome[15]. Another study showed visual success of 2% in older patients with visual acuity of 6/60 or worse and hole diameter of more than 500 mm[6]. In our study minimum diameter was 516 mm and most cases were having visual acuity of 6/60. Visual success can be improved by timely presentation and intervention.

CONCLUSION

Surgical intervention for macular hole (PPV with ILM peel) is associated with significant anatomical and functional improvement. Results could be better if surgery is performed at an earlier time.

Author's affiliation

Dr. Nadeem Ahmad
Vitreo-retina Fellow
COAVS, Lahore

Dr. Syed Raza Ali Shah
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. Qasim Lateef Ch
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. M. Younis Tahir
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. Tehseen Mehmood Mahju
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. Ch Nasir Ahmed
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. Muhammad Arif
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. Sohail Sarwar
Department of Ophthalmology
Mayo Hospital, Lahore

Dr. Anwar-ul-Haq
Department of Ophthalmology
Mayo Hospital, Lahore

Prof. Asad Aslam Khan
Department of Ophthalmology
Mayo Hospital, Lahore

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