

## Original Article

# Anatomical and functional outcomes of retinectomies in retinal detachments complicated by proliferative vitreoretinopathy

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## Abstract

**Purpose:** To study anatomical and functional outcomes of retinectomies in rhegmatogenous retinal detachments complicated by proliferative vitreoretinopathy.

**Methods:** This is a retrospective interventional consecutive case series of eyes with rhegmatogenous retinal detachments complicated by advanced proliferative vitreoretinopathy and managed by relaxing retinectomy over a period of seventeen years. Three-port pars plana vitrectomy included core vitrectomy and removal of all epi-retinal membranes. On failure to flatten, retina was cut and excised. Basal vitrectomy and removal of anterior flap of retina then followed. Silicone oil was used as tamponade in majority of cases. The dependent variables were anatomical and functional outcomes. The statistical analysis was performed on SPSS 21.

**Results:** Series included 370 eyes of 337 patients. Mean follow up was 39 months. Scleral explant was used in 90(24.39%) cases. Two hundred and nine (56.49%) eyes were operated with trans conjunctival sutureless vitrectomy technique. Procedure was bilateral in 33 patients (9.79%). Retina attached in 311(84.05%) eyes after initial surgery. Final re-attachment after one or more surgeries was achieved in 344(92.97%) eyes. Two hundred and eleven (57.02%) cases achieved visual acuity of 6/60 or better.

**Conclusion:** Relaxing retinectomies have good and encouraging anatomical and functional outcomes. This surgery can be effectively carried out with trans conjunctival sutureless vitrectomy technique.

**Keywords:** Retinotomy and retinectomy, Proliferative vitreoretinopathy, Trans conjunctival sutureless vitrectomy, Silicone oil

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## Introduction

Proliferative vitreoretinopathy (PVR) is a complex cellular reaction representing a vitreo-retinal wound healing response characterized by formation of periretinal non-vascular fibrocellular membranes, intraretinal fibrosis and subretinal bands, and is a major cause of surgical failure of rhegmatogenous retinal detachment (RRD) surgery.<sup>1</sup> Relaxing retinectomy (RR) is performed to cut or excise the stiff

retina in the process of treating RRDs complicated by advanced PVR and is an effective procedure for flattening the retina as an adjuvant to vitrectomy. It is an attempt to salvage the visually significant posterior retina by excising the fibrotic peripheral retina.<sup>2,3</sup>

In current surgical practice RR involves pars plana vitrectomy (PPV) with scleral explant, as primary pars plana vitrectomy (PPPV) without scleral explant along with stiches to scleral ports and PPV with no stiches performed by trans

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conjunctival sutureless vitrectomy (TCSV) technique. The availability of better instrumentation and visualization, and use of perfluorocarbon liquids (PFCL) as surgical tool<sup>4</sup> has made the retinal surgeon do a lot that could not be done in past. The use of scleral explants once common in RR is on decline in present era.<sup>5</sup> The Silicone Study Group<sup>6</sup> reported 19% primary >180° retinotomy, Faude et al.<sup>7</sup> reported 15% primary 360° retinotomy and Tseng et al.<sup>8</sup> reported 64.2% primary retinectomies in their series of 81 retinectomies. Quiram et al.<sup>9</sup> advocated radical anterior vitreous base dissection and lensectomy in retinectomy with complex PVR-related retinal detachments (RD). Vitreous base shaving and excision of anterior flap of retinectomy is becoming part of RR.<sup>10</sup> Complicated retinal surgical procedures are increasingly being reported with TCSV technique.<sup>11,12</sup> As a result of all these advances reports for better anatomical re-attachments and visual outcomes about the efficacy of RR are on increase.<sup>10,13</sup>

Our study presents anatomical and functional outcomes of the largest case series undergoing RR in RDs complicated by PVR over a period of 17 years (1999–2015). The study also reflects and gives insight into incorporation of above-mentioned advances into practice.

## Patients and methods

This is a retrospective interventional case series of consecutive surgeries of PPV with retinectomies in 370 eyes of 337 patients from January 1999 to June 2015 in patients with RRDs complicated by advanced PVR. Series includes patients with a minimum follow up of six months. Approval by Institutional Review Board was obtained for this retrospective study. All patients signed an informed consent form before the procedure. Surgeries were performed by a single surgeon (MIA) at Civil Hospital, Dow University of Health Sciences and at Hashmani Hospital, Karachi, Pakistan. Patients with trauma, proliferative diabetic retinopathy, retinal incarceration, inflammatory eye diseases, retinopathy of prematurity, and giant retinal tears were not included in this study. Surgeries were performed using Associate (DORC), Accurus (Alcon), Pulsar 2 (Optikon) and Constellation (Alcon) vitrectomy machines.

Data were collected in accordance with compliance guidelines outlined by the Declaration of Helsinki. Medical records of all these patients were reviewed, and age, sex, ophthalmic

history, preoperative and postoperative visual acuity (VA) and intra ocular pressure (IOP), notes of anterior segment and fundus examinations, and intraoperative or postoperative complications were obtained. The cases included had Grade C Posterior and Anterior PVR evaluated intra-operatively by modified Retinal Society Classification.<sup>3</sup> (Table 1) Information collected also included number of prior vitreo-retinal surgeries, type of temponade used, extent of retinectomy, removal of silicone oil (ROSO), number of surgeries and complications encountered during operative and postoperative period.

Surgeries in this series were performed under general anesthesia. Peritomy around limbus, and encirclement with solid silicone band along with buckle was performed in the initial period in 90(24.32%) cases. Three scleral ports were made 3.5 mm from the limbus for PPV in phakic eyes and at 3.00 mm from limbus in aphakic and pseudophakic eyes. Later on procedure was done as PPPV in 71(19.19%) eyes without explants. Crystalline lens was removed as part of procedure in all phakic patients. Lensectomy was performed in 16(4.32%) cases. Phacoemulsification with intraocular lens (IOL) implantation was performed in 246(66.49%) phakic eyes. This procedure was done prior to making ports for PPV. In all patients undergoing phacoemulsification with IOL, central posterior capsulotomy with vitreous cutter was performed as a routine procedure. In later part of series, from 2006 onwards, all 209(56.49%) cases were performed with 23 Gauge and 20 Gauge TCSV technique.

Surgeries were performed using binocular indirect ophthalmology microscope (BIOM) as wide-angle system. Triamcinolone acetate (TA) was used in the later part of series to identify vitreous and epi-retinal membranes (ERM). Core-vitrectomy was performed and careful identification and meticulous removal of surface retinal fibrous proliferations was carried out in all cases. The Silicone oil (SO) was removed, when present in referred cases, or as a part of repeat surgery in re-detachments, by active aspiration in the initial part of series and by passive method through non-valved cannulae in later part of the series. Corneal epithelium was removed with cotton bud whenever intraoperative corneal edema interfered in visualization mostly seen in eyes with preoperative hypotony. The decision to perform retinectomy was made only after maximal removal of surface fibrous proliferations failed to adequately release retinal traction, in presence of visible contracted retina and presence of sub-retinal fibrosis thought to be contributing

**Table 1.** 370 cases of retinotomies and retinectomies in PVR. (Grading of PVR According to Modified Retinal Society Classification 1991).<sup>3</sup>

PVR grading	PVR type	Eyes	Extent of retinectomy
CP 10 to CP 12 CP 12 to CP 02 CP 03 to CP 05 CP 07 to CP 09	Type 1 Focal/Type 2 Diffused, + - Type 3 Subretinal strands	126 (34.05%)	90°
CA 09 to CA 03 (Superior Retina) CA 09 to CA 03(Inferior Retina)	Type 1 Focal/Type 2 Diffused, + - Type 3 Subretinal strands	105 (28.38%)	180°
CA 01 to CA 12 360° Retina	Type 1 Focal/Type 2 Diffused, + - Type 3 Subretinal strands Type 4 Circumferential Contraction Type 5 Anterior displacement	139 (37.57%)	360°

PVR = Proliferative Vitreoretinopathy, C = Grade C PVR, which denotes full-thickness rigid retinal folds. Extent of PVR is expressed by number of clock hours of the retina involved (1–12). CP denotes PVR predominantly posterior to vitreous base and equator, CA denotes PVR anterior to equator up to ora serrata and beyond. Further description of CP PVR and CA PVR describes contraction types such as Type 1 (Focal), Type 2 (Diffused), Type 3 (Subretinal strands), Type 4 (Circumferential contraction), and Type 5 (Anterior displacement).

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