Outcomes of Phacovitrectomy Performed Without Preoperative Steroid Therapy in Cases of Retinal and Choroidal Detachment

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Background: *This study aimed to evaluate the anatomical and functional outcomes of combined phacoemulsification and microinvasive pars plana vitrectomy (phacovitrectomy) performed without preoperative steroid administration in patients with rhegmatogenous retinal detachment associated with choroidal detachment (RRD/CD).*

Methods: *Medical records of patients diagnosed with RRD/CD without a history of ocular trauma or prior intraocular surgery were retrospectively reviewed. All cases underwent phacovitrectomy with silicone oil (SO) tamponade, without the use of systemic or local corticosteroids before surgery. Patients were followed for a minimum of three months, with a mean follow-up duration of 10.3 ± 10.1 months.*

Results: *A total of 17 eyes from 17 patients (9 men and 8 women; mean age 60.4 ± 8.4 years) met the inclusion criteria. No eyes received intraocular lens implantation or additional scleral procedures during the initial operation. Preoperative ultrasonography revealed severe choroidal detachment in 10 eyes (58.8%), moderate in 2 eyes (11.8%), and mild in 5 eyes (29.4%). Primary retinal reattachment was achieved in 15 eyes (82.4%) after a single surgery. Of these, 14 eyes underwent silicone oil removal, 8 received intraocular lens implantation, 2 underwent epimacular membrane peeling, and 1 was re-tamponaded with silicone oil. Two patients developed recurrent detachment within one month due to proliferative changes and declined reoperation. Postoperatively, 15 eyes showed visual improvement, and 10 eyes achieved a final visual acuity of ≥0.1 (20/200). The mean intraocular pressure (IOP) at final follow-up was 15.7 ± 4.2 mmHg (range: 10–28 mmHg).*

Conclusions: *Combined phacovitrectomy without preoperative corticosteroid therapy provides favorable anatomic and visual outcomes in RRD/CD management. Omitting pre-surgical steroid use shortens the preoperative waiting period and minimizes potential complications associated with systemic or local corticosteroid administration.*

BACKGROUND

Rhegmatogenous retinal detachment accompanied by choroidal detachment (RRD/CD) is an uncommon but serious ocular condition characterized by intense intraocular inflammation and an unfavorable visual prognosis[1]. Advances in vitreoretinal surgery have improved the single-operation retinal reattachment rates, particularly through the use of primary vitrectomy combined with preoperative systemic corticosteroid therapy [2,3]. Additionally, periocular or intravitreal triamcinolone injections have been reported to achieve outcomes comparable to systemic steroid administration[4]. However, Denwattana et al. [5] demonstrated that although preoperative corticosteroid therapy can effectively alleviate choroidal detachment before vitrectomy, it does not significantly enhance single-operation reattachment rates or postoperative visual acuity at

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three months compared with cases managed without steroids. Furthermore, several studies have suggested that combining lens extraction or lensectomy with vitrectomy may improve anatomical outcomes in RRD/CD patients[3,6,7].

Since 2015, our clinical approach has involved performing combined phacoemulsification and microinvasive pars plana vitrectomy (phacovitrectomy) without preoperative corticosteroid administration. This strategy has yielded consistently satisfactory anatomical and functional results, suggesting that steroid-free management may be a viable and efficient alternative for treating RRD/CD.

MATERIALS AND METHODS

Study Design and Participants

A retrospective review was conducted on patients who underwent combined phacoemulsification and pars plana vitrectomy (phacovitrectomy) for rhegmatogenous retinal detachment associated with choroidal detachment (RRD/CD) between June 2014 and March 2018. Diagnosis of choroidal detachment (CD) was established by indirect ophthalmoscopy or B-scan ultrasonography. Patients were excluded if they had a history of recurrent retinal detachment, previous ocular surgery, ocular trauma, or follow-up less than 3 months. Cases with isolated ciliary detachment confirmed by ultrasound biomicroscopy (UBM) but without choroidal detachment on B-scan were also excluded. The severity of CD was categorized as mild, moderate, or severe based on the extent of detachment according to the criteria described by Sharma[8]. Preoperative ciliary body detachment was similarly graded by measuring the angle on UBM following the method of Li[9].

Clinical data were collected for each patient, including age, sex, preoperative visual acuity, intraocular pressure (IOP), surgical details, retinal status (attached/detached), final visual acuity, and final IOP. This study complied with the principles of the Declaration of Helsinki and was approved by the Ethics Committee of Chongqing Aier-Mega Eye Hospital.
Written informed consent was obtained from all participants prior to surgery.

Surgical Procedure

All surgeries were performed under local anesthesia using transconjunctival sutureless microinvasive vitrectomy (23- or 25-gauge) combined with phacoemulsification. Initially, a trocar was placed in the inferotemporal quadrant. In cases with extremely low intraocular pressure, a small volume of balanced saline solution (BSS) was injected intravitreally using a 1 mL syringe to maintain sufficient pressure for trocar insertion. The surgeon ensured that the cannula was positioned within the vitreous cavity before initiating irrigation.

For drainage of suprachoroidal fluid, an additional trocar was introduced through either the superotemporal or superonasal quadrant, just beneath the sclera. Gentle compression of the globe with a cotton swab facilitated drainage, after which irrigation was temporarily halted. A 2.2 mm clear corneal or corneoscleral incision was made for phacoemulsification. If the anterior chamber was excessively deep, partial fluid release was performed to achieve a moderate depth. A dispersive viscoelastic (Viscoat) was injected to stabilize the anterior capsule surface. Given the frequent presence of zonular weakness, continuous curvilinear capsulorrhexis was carefully performed using a needle or forceps. Standard phacoemulsification was then completed, but no intraocular lens implantation was performed during the primary surgery.

Subsequently, a wide-angle viewing system was used to perform vitrectomy.

The superonasal and superotemporal trocars were reinserted if necessary to ensure proper intraocular positioning. Complete vitreous removal was achieved, followed by retinal reattachment using perfluorocarbon liquid or air-fluid exchange. Retinal breaks were treated with endolaser photocoagulation, and silicone oil was injected for internal tamponade. No scleral buckling or encircling procedures were performed in any case.

Results

Seventeen eyes from 17 patients (9 men and 8 women) were included, with a mean age of 60.4 ± 8.4 years. Preoperative B-scan ultrasonography showed severe choroidal detachment in 10 eyes (58.8%), moderate in 2 (11.8%), and mild in 5 (29.4%). Among the 15 eyes that underwent preoperative UBM, 12 (80%) showed severe ciliary body detachment and 3 (20%) had mild detachment. Most eyes with severe choroidal detachment also had severe ciliary body detachment, although this relationship was not absolute.

Phacoemulsification was successfully completed in all eyes except one (case 1) with posterior capsule rupture, which required an anterior capsulotomy.

Postoperatively, the anterior chambers were quiet with minimal inflammation. Fifteen eyes (82.4%) achieved retinal reattachment after a single surgery. Among these, 14 underwent silicone oil (SO) removal, with 8 receiving intraocular lens (IOL) implantation and 2 requiring epimacular membrane peeling during SO removal. One case required SO refilling for safety due to rigid retinal folds, and another underwent encircling for a new tear at the time of SO removal.

Two eyes experienced redetachment within one month but declined reoperation. Visual acuity improved in 15 eyes, with 10 eyes (58.8%) achieving ≥0.1 (20/200). The mean final intraocular pressure was 15.7 ± 4.2 mmHg (range: 10–28 mmHg).

Table 1: Baseline and Surgical Outcomes of Patients with Preoperative RRD/CD Undergoing Phacovitrectomy

ase	Sex/Age (years) / Additional features	Ciliary Body Detachment	Choroidal Detachment	Initial VA	Final VA	IOP (Initial/Final, mmHg)	Follow-up (months)	Anatomical Outcome After First Surgery	Remarks
1	F / 60–69 / High myopia	—	Severe	FC	0.1	04-Dec	48	Retina attached	Silicone oil removed
2	F / 60–69 / EMM	—	Mild	0.02	0.3	Dec-28	9	Retina attached	Silicone oil removed; IOL implanted
3	M / 60–69 / Old RRD	Severe	Severe	HM	0.05	08-Nov	15	Retina attached	Silicone oil removed
4	F / 50–59	Severe	Severe	0.04	0.3	15-Dec	8	Retina attached	Silicone oil removed; IOL implanted
5	M / 70–79 / MHRD	Severe	Mild	0.04	0.04	Sep-18	8	Retina attached	Silicone oil removed
6	M / 60–69	Severe	Moderate	0.1	0.25	3.7 / 10	10	Retina attached	Silicone oil removed; IOL implanted
7	F / 50–59	Mild	Severe	FC	0.1	Oct-15	8	Retina detached	Silicone oil retained
8	M / 40–49 / High myopia	Severe	Severe	HM	0.2	Jun-17	10	Retina attached	Silicone oil removed; IOL implanted

9	**F / 60–69**	**Severe**	**Moderate**	**0.1**	**0.15**	**Aug-16**	**10**	**Retina attached**	**Silicone oil retained**
10	F / 50–59	Severe	Severe	HM	0.05	Aug-15	6	Retina detached	Silicone oil retained
11	F / 50–59 / MHRD	Severe	Mild	0.02	FC	Mar-17	8	Retina attached	Silicone oil removed; IOL implanted
12	M / 60–69	Severe	Severe	HM	0.15	Mar-17	8	Retina attached	Silicone oil removed; EMM peeled; IOL implanted
13	M / 60–69 / MHRD	Severe	Mild	0.02	0.06	8 / 20.5	7	Retina attached	Silicone oil removed
14	M / 60–69	Severe	Severe	HM	0.4	Jul-14	7	Retina attached	Silicone oil removed
15	M / 70–79	Severe	Severe	HM	0.05	Dec-14	4	Retina attached	Silicone oil removed; cryotherapy + encircling performed
16	M / 60–69	Mild	Severe	HM	FC	May-13	4	Retina attached	Silicone oil removed; membrane peeled; SO refilled
17	F / 30–39 / High myopia	Mild	Mild	FC	0.15	Jul-18	5	Retina attached	Silicone oil removed; IOL implanted

EMM – Epiretinal membrane; FC – Finger counting; HM – Hand motion; IOL – Intraocular lens; MHRD – Macular hole–associated retinal detachment; SO – Silicone oil; RRD/CD – Rhegmatogenous retinal detachment with choroidal detachment; VA – Visual acuity; IOP – Intraocular pressure.

DISCUSSION

The reported incidence of rhegmatogenous retinal detachment with choroidal detachment (RRD/CD) varies between 2–8.6% [10–12]. Li[9] found that up to 18.7% of RRD cases may present with CD when evaluated by UBM, which can also detect isolated ciliary body detachment (CBD) that may not appear on B-scan. Since isolated CBD did not influence surgical outcomes in prior work, such cases were excluded from this study. Our results demonstrated an 82.4% single-operation reattachment rate without preoperative steroid administration — comparable to prior reports using systemic or local corticosteroids (51–81.8%)[2, 3, 5, 8, 13–15].

While steroids are thought to reduce inflammation and aid surgical outcomes, some studies, including Denwattana[5], found no significant advantage in final anatomical or visual outcomes. This suggests that prompt surgical repair and complete retinal reattachment may play a more critical role in inflammation control than steroid pretreatment. Previous research also indicated that aphakic or pseudophakic eyes may have higher reattachment rates and lower postoperative hypotony than phakic eyes[6, 7]. Similarly, Xu[16] reported improved success with phacovitrectomy without IOL implantation (78%) compared to combined IOL implantation (40%). In our series, phacovitrectomy

without IOL placement yielded comparable results, supporting the idea that delaying IOL implantation helps minimize postoperative inflammation.

Phacovitrectomy offers several advantages over lensectomy plus vitrectomy, including easier visualization, preservation of the posterior capsule, and smoother manipulation during silicone oil tamponade. Moreover, cataract extraction at the time of vitrectomy simplifies future management, as most patients develop cataracts after vitreoretinal surgery with gas or SO tamponade[17].

CONCLUSION

Combined phacovitrectomy without preoperative steroid use achieved favorable anatomical and visual outcomes in patients with RRD/CD. This approach shortens pre-surgical waiting time and avoids steroid-related complications while maintaining a high rate of retinal reattachment. Further prospective, multicenter randomized controlled studies are warranted to validate the efficacy and necessity of steroid-sparing strategies in this patient population.

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