Rates and outcomes for pars plana vitrectomy following traumatic ocular injury and initial globe repair, a retrospective analysis at a level one trauma center

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Purpose

Penetrating and perforating ocular trauma is often devastating and may lead to complete visual loss in the traumatized eye and subsequent compromise of the fellow eye. Repair of any corneoscleral laceration with prompt closure of the globe remains the gold standard in the management of a salvageable eye following penetrating and perforating ocular injuries. However, a significant proportion of traumatic injuries are complex, requiring early vitreoretinal intervention to preserve vision. Unfortunately, despite prompt vitreoretinal intervention, prognosis for vision preservation often remains guarded. A retrospective analysis at a level 1 trauma center was performed to evaluate the time course, rates, and outcomes following pars plana vitrectomy after traumatic ocular injury and initial globe repair.

Methods

Eyes that underwent open globe repair following ocular trauma at San Antonio Military Medical Center, a level 1 trauma center, between 01 January 2014 and 30 Dec 2016 were examined. Specific factors evaluated include mechanism of injury, defect size and complexity, ocular trauma score, zone of injury, associated orbital trauma, and time from injury to surgical intervention. A subset analysis was conducted specifically on those eyes requiring subsequent pars plana vitrectomy for vision preservation due to vitreoretinal disease.

	Patients who underwent OGR	Patients who underwent PPV	Patients who DID NOT undergo PPV
Average time (days) to PPV		18.8	n/a
Re-Operation PPV (%)	17	17 (39.5)	n/a
PVR (%)	16	16 (37.2)	1 (3.7)
Endophthalmitis (%)	1	1 (2.3)	0 (0.0)
Additional Complications (%)	19	16 (37.2)	3 (11.1)

Table 1: Patient Demographics

Results

Patients who underwent pars plana vitrectomy showed improvement of visual acuity from 2.5 logMAR following initial injury to 1.5 logMAR 6 months following pars plana vitrectomy, equivalent to 20.1 EDTRS letters gained. Post-operative complications included one case of endophthalmitis (2.3%) and sixteen cases of proliferative vitreoretinopathy (37.2%).

	Patients who underwent OGR	Patients who underwent PPV	Patients who DID NOT undergo PPV
Total Number	70	43	27
Lost to Follow Up (%)	9	3 (7.0)	6 (22.2)
Average Age, years	44.7	41.3	50.1
Male (%)	54	35 (81.4)	19 (70.4)
Endophthalmitis (%)	7	7 (16.3)	0 (0.0)
RD (%)	31	22 (51.2)	9 (33.3)
APD (%)	42	30 (69.8)	12 (44.4)
Ruptured (%)	36	21 (48.8)	15 (55.6)
Perforating (%)	32	21 (48.8)	11 (40.7)
Orbital fracture (%)	11	9 (20.9)	2 (7.4)
Retained IOFB (%)	15	10 (23.3)	5 (18.5)
Vitreous Heme (%)	37	33 (76.7)	4 (14.8)

Table 1: Patient Demographics

Conclusion

Overall, patients requiring pars plana vitrectomy following open globe repair generally had more severe injuries. Although rates of complications were relatively high, a significant improvement in visual acuity was demonstrated at six months post-operatively. Patients who did not undergo pars plana vitrectomy tended to have more mild injuries and suffered less complications, but showed comparably less improvement in visual acuity at six months following repair.

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