OCULAR INJURIES CAUSED BY BB GUN

M.S. Farahvash

Department of Ophthalmology, Faculty of Medicine, Tehran University of Medical Sciences, Tehran Iran

Abstract - In orderc to determine the prognosis of perforating eye injuries caused by BB guns in our patients, the visual and anatomic results of 14 patients with gun injuries seen between September 1996 and February 1998 in Farabi Hospital and private office in Tehran were reviewed. Five patients had nonperforating eye injuries. All perforated eyes underwent scleral buckling, tensectomy, vitrectomy and silicone injection. All injured eyes had a visual acuity of light perception or better at presentation. Among 9 cases of perforating injuries, 7 had double and 2 had single perforation. All patients had a final visual acuity of hand motion or better; 7 patients achieved a visual acuity of $\geq \frac{1}{16}$ *and 5 of* $\geq 3/10$*. This study shows that in some ocular injuries caused by BB guns vision may be retained with vitreo - retinal surgeries.*

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Key Words: BB gun, BB eye injuries, Eye injuries.

INTRODUCTION

Because of the delicacy and pecularities of ocular tissues, an injury that would be insignificant elsewhere in the body, is a serious one in the eye and may result in the immediate or eventful total loss of vision in one or both eyes. These injuries occur much more frequently in children and adults.

Before the advent of vitrectomy techniques, most perforating injuries resulted in enucleation (1,2). advances have improved the visual and anatomic outcome (3).

Ocular injuries secondary to BB gun, are not uncommon in Iran. Community awareness of the danger of air-powered guns is the first step in the process of preventing injuries, and represents an area in which ophthalmologists can make a significant contribution to the prevention of blindness.

MATERIALS AND METHODS

I reviewed the visual and anatomic results of 14 patients with BB gun injuries seen between September 1996 and February 1998 in Farabi Eye Hospital of Tehran University of Medical Sciences and my private office. The anatomic and functional status of the eye before repair, at initial examination and at the time of surgery, were reviewed. We studied the initial visual acuity after the injury, presence or absence of an afferent pupillary defect, orbital fracture, lid laceration, lens damage, presence and severity of vitreous hemorrhage and any retinal damage, including retinal detachment and the type and number of any retinal breaks. The presence of a single or double penetrating wound and the location of any intraocular pellets were noted.

Most of the eyes with severe irreparable injuries, with no light perception (NLP) and 4+ afferent pupillary defect (APD), were enucleated after at least one week of observation by the ocular trauma service and not included in this study. Among 9 cases of perforating injuries, 7 had double and 2 had single perforation. Five patients had nonperforating eye injuries. All of perforated eyes underwent scleral buckling, lensectomy, vitrectomy and silicone injection, after a period of one to two weeks of observation or until retinal detachment, retinal traction of PVD posterior vitreous detachment (PVD) was noted in ultrasonography.

Details of all primary and subsequent surgical procedures were recorded including the length of follow-up, final best corrected VA visual acuity (VA) and the anatomic status of the eye, including the development of corneal opacity, cataract, pupillary membrane, retinal detachment, glaucoma and phthisis bulbi.

RESULTS

Of the 14 patients with gun injuries, 13 (92.8%) were male and 1 (7.2%) was female. The ages of the patients at the time of injury varied from 3 to 45 years (mean = 19.2%); 8 (57.1%) of them were 18 years old or younger. The follow-up varied between 1 month to 16 months. The (VA) at presentation was light perception (LP) with poor projection in 3 cases, LP with good projection in 3 cases, hand motion (HM) in 2 cases and CF/1m to 2/10 in 6 cases. APD ranged between 1 + to 4+.

Vitreous hemorrhage was present in all cases. (Fig. 1). In echography, hemorrhagic choroidal detachment was evident in 6 cases. In 3 cases, subretinal hemorrhage was noted during the surgery. Macular perforation or contusion was noted in 6 cases (Fig. 2).

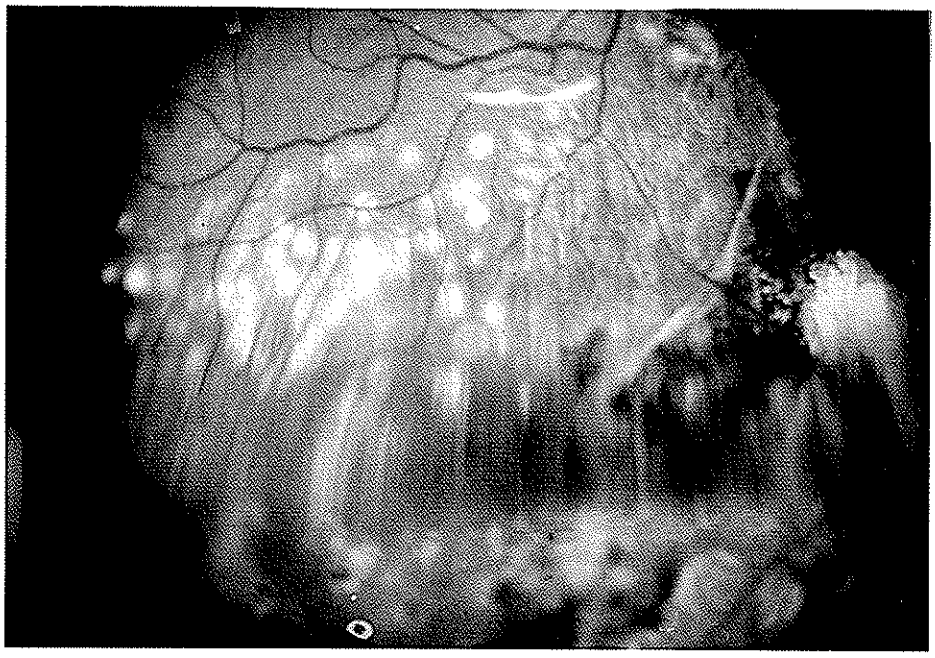

Fig. 1- Case 1, Posterior site in nasal inferior quadrant

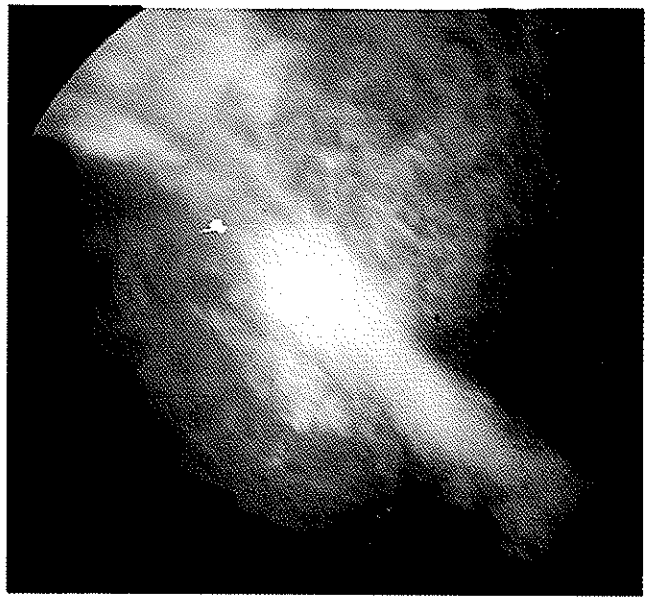

Fig. 2- Case 5, connected entrance and exit sites

In all perforated cases the entrance site was sutured by 7.0 silk sutures, but exit wound was not able to be closed in most of cases. All 9 perforated cases had successful lensectomy, vitrectomy, placement of scleral buckle and silicone injection. The timing of vitrectomy, ranged from 10 days to 6 weeks after injury. Of 5 non-perforated cases, there were 2 cases of commotio-retina, 2 cases of chorioretinitis sclopetaria (Fig. 3), one case of commotio retinae with sclopetaria: 2 of these cases had retinal dialysis. All patients had a final visual acuity of HM or better with 7 patients achieving 1/10 or better and 5, 3/10 or better. Clinical data and visual results are shown in table 1.

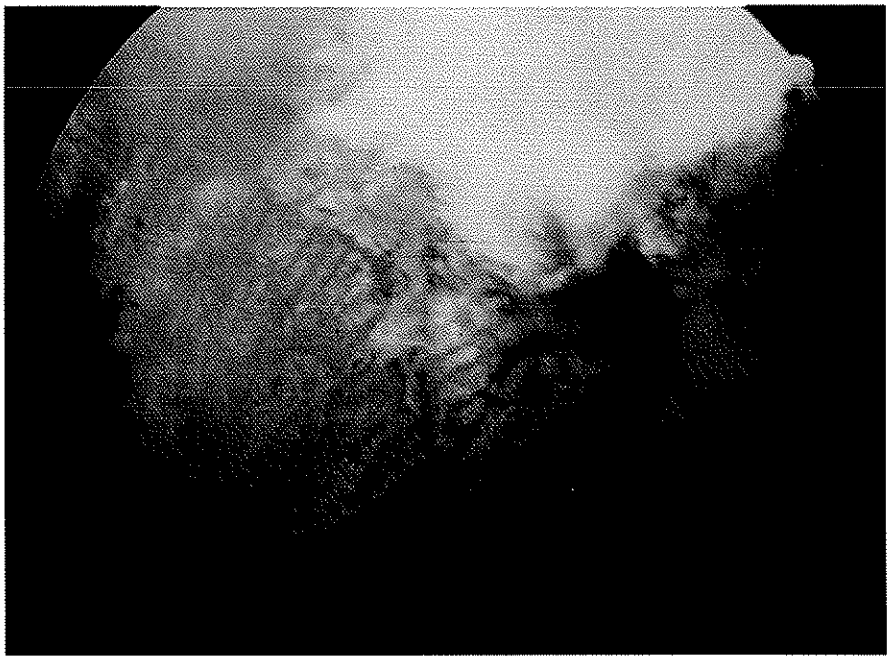

Fig. 3- Case 6. BB exit site in mid-periphery

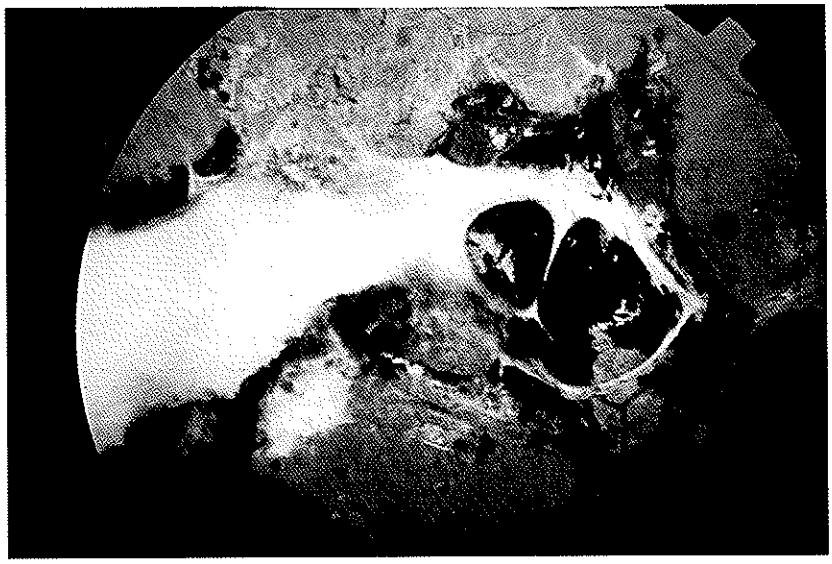

Fig. 4- Case 14. Chorioretinitis sclopetaria

Table 1- Clinical data on the 14 cases with BB injuries

case No.	eye	age (year)	sex	type of perforation	presenting VA	vitreous hemorrhage	APD	RD	operation	final Va
1 (Fig. 1)	O.D.	16	M	Double	HM	+	3+	-	Buckling, vitrectomy lensectomy, silicone	8/10
2	O.D.	24	M	Double	LP	+	2+	+	// // //	CF/0.5
3	O.S.	3	F	//	//	+	3+	+	// // //	CF/20c
4	O.D.	11	M	//	2/10	+	1+	-	// // //	6/10
5 (Fig. 2)	O.S.	18	M	//	HM	+	2+	+	// // //	1/10
6 (Fig. 3)	O.S.	30	M	//	LPP	+	3+	-	// // //	2/10
7	O.S.	6	M	//	LPP	+	2+	+	// // //	CF/1m
8	O.D.	45	M	single	LPP	+	2+	-	// // and lofb rem.	CF/2m
9	O.D.	30	M	//	LP	+	4+	+	// // //	HM
10	O.D.	11	M	non-perforating commotio-retina	CF/2m	+	3+	-		1/10
11 (Fig. 4)	O.S.	22	M	non-perforating chorioretiniting	CF/5m	+	2+	-		9/10
12 (Fig. 4)	O.D.	8	M	non-perforating commotio-retina	1/10	+	1+	-		5/10
13 (Fig. 4)	O.S.	21	M	non-perforating chorioretinitis sclopetaria	CF/5m	+	1+	-		6/10
14 (Fig. 4)	O.D.	15	M	non-perforating commotioretinae chorioretinitis sclopetaria	CF/1m	+	2+	localized	scleral buckling	CF/5m

DISCUSSION

These results indicate that BB gun injuries cause serious eye lesions. Vision was seriously affected in most cases. The majority of patients were 18 or younger, and only was female. visual prognosis was more favorable in nonperforating injury, (4), but much of the damage from a BB injury may be caused at the time of initial contusion and prior to the actual perforation (5). We also observed cases of intraocular damage caused predominantly by the effects of confusion.

Perforating eye injuries, there is loss of intraocular contents as well as incarceration of retina and vitreous in the exit wound.

Reports of previtrectomy-era show that 90% of the eyes with BB gun injuries were enucleated (6,7). Modern vitrectomy techniques have led to improved visual outcomes (3). A major objective of the pars plana vitrectomy is to remove the scaffold along which the proliferation and contraction occurs, but is usually deferred for at least 1 week, until the posterior wound has formed a plug and the posterior vitreous has detached(8,9).

Preceding studies show that most patients were shot by a friend or relative, were innocent bystanders, or were assaulted with a BB gun (10).

The damages of air guns has been recognized in other countries, where attempts have been made to regulate their use (2). A complete ban on the sale or use of air guns is desirable to prevent blinding injuries. An alternative approach would be to alter the nature of the gun so as to reduce its potential for causing eye injury.

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