TRAUMATIC CATARACT WITH INTRAOCULAR FOREIGN BODY

Dr. S. A. Motwane
Dr. A. S. Ahuja
Dr. Mohan Mahajan
Dr. Shruti Kothari
Dr. Shahnawaz Kazi
Dr. Shankar Balasubramanium

The history of intraocular foreign body starts from the time when man designed a hammer and chisel. In 1200 BC an artist painted a picture of a man getting a foreign body removed from his eye, while building a tomb on the banks of the river Nile. During the first world war SirWilliam Lister was appointed in Moorfield's Eye Hospital and he was responsible for doing pioneering work in intraocular foreign bosied. The very discovery that piesec of the windshield of planes gave no reaction intraocularly led Sir Harold Ridley to use PMMA as material for IOLs.

Rapid industrialization has led to an increase in problems of ocular trauma. The Lokmanya Tilak Municipal Medical College and Hospital is a major trauma Centreand deals with intraocular foreign bodiesranging from those found in agricultural and industrial settings often associated with cataract formation. A total of 192 cases of IOFB treated in Lokmanya Tilak Hospital from the year 1995 to 2000 were reviewede.

Basic evaluation consisted of an exact medical history depending on the type of foreign body and the mechanism of entry of the foreign body. The examination consisted of assessing the visual acuity for medicolegal purposes, slit lamp examination for assessing the corneal status, the site of entry, the stste of the anterior chamber and lenticular examination to note the type of cataract.Afferent pupillary defects and the presence or absence of iris tears were ruled out. Intraocular pressur, gonioscopy and fundus examination were done if possible.

Radiological examination consisted of:

a) X-Ray with the Pfieffer Comberg contact lens in different gazes: viz, looking up, looking straight ahead and looking down: to tell wheter the foreign body is intravitreal or within the scleral coats. Correction also has to be applied for the magnification factorr.

b) Ultrasonography especially for radiolucent and organic foreign bodies. IOFBs less than 3mm are not visualized by this method. The mobility of the IOFB can be judged and vitreous haemorhage and retinal detachment ruled out. The A Scan measurement of the axial length enable appropriate correction to be made to radiological localization.

c) CT Scan and MRI are useful in cases of double perforation. MRI is contraindicated in magnetic foreign bodies.

In our study the visual acuity documented on admission was as follows:

Visual acuity	Percentage
No PL	14.28 %
MB	71.42 %
FC 3-6m	5.7 %
6/60 - 6/18	5.7 %
6/12 - 6/6	2.8 %

In our study, the types of foreign bodies encountered were:

Magnetic	Iron	82.81 %
Non-Magnetic	Copper	2.85 %
	Wood	8.57%
	Glass	4.7 %
	Alloy	1 %

Intraocular Foreign body location:

Location	Percentage
Anterior chamber and lens	11.4%
Mid vitreous	40%
Retinal	31.5%
Coats of eyeball	17.14%

Foreign body size:

IOFB size	Percentage
0 - 3 mm	34.28 %
3 - 6 mm	48.5 %
> 6 mm	17.1 %

Table showing the Foreign body size and visual acuity:

Visual acuity	Foreign body size (percentage of cases)		
	< 3 mm	3 - 6 mm	> 6 mm
No PL	8	34	18
PL to 3m	24	24	48
3m - 6m	8	nil	nil
6/60 - 6/18	16	38	16
6/12 - 6/6	24	24	16
Lost to follow up	16	nil	nil

The cataract associated with an IOFB may be:
a) early or late (rosette)
b) Progressive or non progressive
c) Localised or total.
Glaucoma, uveitis, vitreous haemorrhage or retinal detachment may be associated with the cataract. Localized cataract not interfering with vision is left alone. Mature cataracts interfering with vision are operated with or without an Intraocular lens, depending on the size of the IOFB. If an IOFB greater than 7 mm in size is removed by the anterior route the clear lens may have to be sacrificed. A posterior chamber, suture supported or iris fixated IOL may be chosen.
The problems associated with primary IOL implantation are unsuspected tear of the posterior capsule, vitreous loss, and IOL implantation obscuring the retinal surgeon's view. The presence of an IOL does not reduce the incidence of endophthalmitis. When an IOFB has caused massive retinal damage and repairing the retina becomes a priority, secondary IOL implantation, either posterior or anterior chamber, or scleral suture supported, may be used.
The IOL power can be determined by A-Scan biometry if possible.or by dtermining the IOL power of the fellow eye or by using a bandage contact lens.

Giant magnets were used to remove IOFBs by the scleral approach in the previtrectomy era. With the advent of vitrectomy the visual prognosis has improved dramatically. The management consists of primary repair of the wound first followed by IOFB removal with cataract extraction, if indicated.

The IOFB in the coats of the eyeball may be removed by:
a) the scleral approach:
The meridian and the distance from the limbus is decided by localization by a Pfeiffer Comberg contact lens and a giant magnet is used.
b) The intravitreal approach:
This includes the use of intraocular magnet or iintraocular forceps for foreign body removal. Silicon oil or PFCL are used as tamponading agents. Endolaser or endocryo is applied around the damaged retina.
The magnets that can be used are either giant electromagnets which have more power or hand held magnets which are effective over 1 to 2 mm, have llower power and are lighter in weight. The power of a magnet is enhanced when it is cold. Hence short pulses are more effective than lengthy indiscriminate use which heats up the giant electromagnet.Pole tips longer than 12 mm waste power. Hence it is vital that the magnet be as close to the foreign body as possible. The degree of attraction experienced by the

Foreign body depends on its size and magnetizabilty. A feebly magnetic body will eventually be attracted if it is exposed to a magnetic field with sufficient variation of intensity over sufficent time. On repeated apllication it becomes more magnetic and can be extracted.
If an IOFB is associated with vitreous haemorrhage, the surgeon waits for 2 weeks for PVD to occur. If the IOFB is associated with a retinal detachment, vitreous haemorrhage or endophthalmitis, immediate surgery is advocateed. Pars plana vitrectomy is advocated for IOFB present in the vitreous. For IOFBs encapsulatedin the retina, vitrectomy with cutting of the capsule, IOFB removal with intravitreal magnet or forceps, with endolaser or endocryotherapy, is the procedure of choice.
The results documented in our study are as follows:

Visual outcome	Route of IOFB extraction (%)		
Visual acuity	Pars plana	Scleral	Limbal
No PL	16	32	
PLPR - 3m	32	32	
3m - 6m	4		
6/60 - 6/18	20	32	50
6/12 - 6/6	28		50
lost to FU	8		

Visual acuity with IOL implantation:

Visual acuity	Percentage
MB - 3m	10.6
3m - 6m	10.42
6/60 - 6/18	34.28
6/12 - 6/6	44.7

Comparison between initial and final visual acuity:

Visual acuity	Percentage
Vision deteriorated	2.8
Vision remained the same	28.57
Vision improved	62.85
Lost to follow up	5.71

Visual acuity with early or late surgery:

Visual acuity	Timing of surgery (%)	
	< 15 days	> 15 days
No PL	14.2	2.8
PL - 3m	22.88	8.7
3m - 6m	nil	nil
6/60 - 6/18	20	2.8
6/12 - 6/6	20	2.8
lost to FU	6.71	nil

Thus in the IOFB management the skill of the anterior segment surgeon is of prime importance along with knowledge of the posterior segment. Here the role of the general ophthalmologist is of paramount importance as he has to make use of both anterior and posterior segment skills.