Clinical and histopathological features of posttraumatic iris cyst

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Iris cyst excision involves complex surgical maneuvers and may have a variable visual outcome depending upon preexisting and postoperative complications. Hereby, we report a case series of 10 eyes from which posttraumatic iris cysts were excised and proven histopathologically. Histopathology records were reviewed. Data regarding patient profile, clinical profile, surgical details, treatment outcomes and follow-up were reviewed. Outcome measures were defined as recurrences, visual acuity and number of other surgeries required. Non-parametric Wilcoxon test was used to compare changes in the visual acuity and Fisher test was used to find out the significance of several risk factors. Mean age was 24.7 years (3-58 years). Mean follow-up was 2.36 years. Mean preoperative logMAR visual acuity was 0.56 in comparison to final logMAR visual acuity of 1.62. Factors related to adverse functional outcome were related to post-surgical complications.

Key words: Histopathology, implantation cyst, inclusion cyst, posttraumatic iris cyst, surgery

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Iris cysts are classified as primary or secondary, with primary cysts being more common.[1] Secondary iris cysts develop as a result of trauma,[2] intraocular parasites,[2] tumors[3] or prolonged use of topical drugs.[4,5] Traumatic iris cysts are rare. These can either be 'solid looking', lined by stratified or cubical epithelium (pearl cyst), or a serous cyst, containing straw-colored turbid fluid. This is due to deposition of surface epithelial cells from the conjunctiva or cornea on the iris after surgical [Figure 1] or penetrating trauma [Figure 2]. This study evaluates the clinical profile and histopathological features of traumatic iris cysts in Indian subjects and elucidates their surgical management and treatment outcome.

Case Report

A chart review was done on all patients presenting with traumatic iris cyst from 1 January 1995 to 31 December 2006. Data were collected for clinical profile, history of ocular trauma and/or surgery, ocular findings, type of surgery, histopathological features, postoperative complications and follow-up. For statistical analysis, the non-parametric Wilcoxon test was used to compare changes in visual acuity at presentation and at last follow up. Fisher test was used to find out the significance of several risk factors with appropriate significance ($P<0.05$).

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Results

Ten patients were identified with traumatic iris cysts. Patients ranged in age from three years to 58 years with a mean of 24.70 ± 17.32 years (Mean ± SD). Six were males and four were females. Four patients had a history of corneal wound repair following trauma and three had prior cataract surgery, while one patient had prior vitrectomy and cataract surgery. On examination, iris cyst was found attached to cornea in three eyes. Anterior chamber involvement was measured in terms of clock hour involvement [Table 1]. Preoperative logMAR vision ranged from 0 to 1.69 with mean of 0.56 ± 0.52 and postoperative logMAR vision ranged from 0 to 4.0 with mean 1.62 ± 1.62. Follow-up ranged from 0.1 year to 7 years with mean 2.36 ± 2.60 years. In all cases, cysts were found to be expanding with time and causing complications such as visual axis obstruction, iritis, glaucoma, and corneal decompensation. Ultrasound biomicroscopy (UBM) was done in eight cases [Table 4] and the extent and involvement of the other structures was identified [Figure 4]. In the remaining two cases, this could be determined by clinical examination alone. All patients underwent removal of cyst with additional surgical procedures done where necessary [Table 2]. Histopathology revealed all cysts to be lined by multiple layers of nonkeratinized stratified squamous epithelium. The contents of the cysts were empty in all cases [Figure 3]. On application of Fisher's test, iris cyst attachment to cornea ($P=0.50$), extension to ciliary body ($P=0.50$), clock hour involvement of anterior chamber ($P=0.60$), intact removal of iris cyst ($P=0.22$) and nature of injury ($P=0.70$) with respect to final visual acuity was found to be statistically insignificant ($P>0.05$). Wilcoxon signed rank test showed statistically significant poor postoperative vision ($P=0.028$) at last follow-up in comparison

Table 1: Clock hour involvement of the cyst in the anterior chamber

Clock hour involvement	Number of eyes	Percentage
1	1	10
2	2	20
3	1	10
4	2	20
5	1	10
6	3	30
Total	10	100

Table 2: Types of surgical procedures performed in all cases

Type of surgical procedures	Frequency	Percentage
Excision of cyst with/without iridocyclectomy	4	40
Excision of cyst with lens removal	1	10
Excision of cyst with vitrectomy	1	10
Excision of cyst with penetrating keratoplasty	3	30
Excision of cyst with IOL removal	1	10
Total	10	100

IOL- Intraocular lens

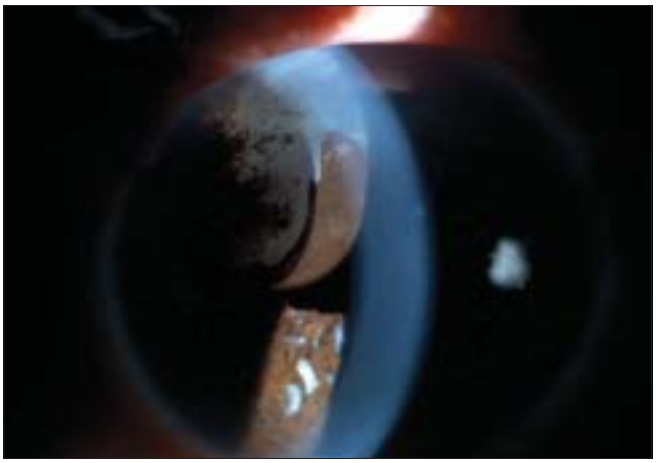

Figure 1: Slit-lamp picture shows an iris cyst that developed one year after cataract surgery (ECCE+IOL). The cyst extends from nine to 12 o'clock meridian with no corneal attachment. Cyst excision with IOL removal was done with no complications

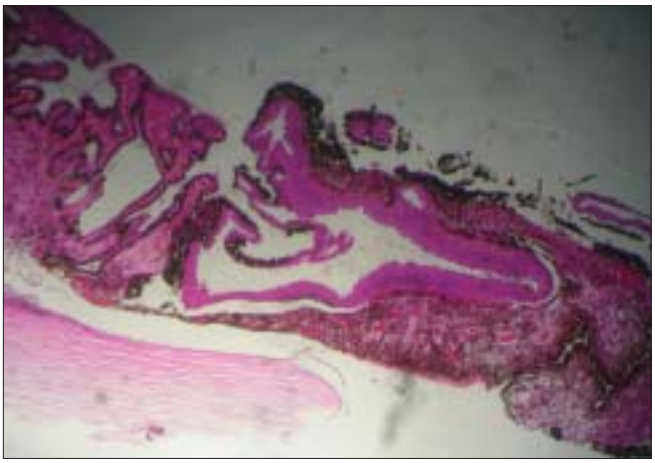

Figure 3: Histopathology image showing a cyst lined by stratified squamous epithelium and surrounded by iris tissue. Cyst content is empty (Hematoxylin-Eosin stain; 100X)

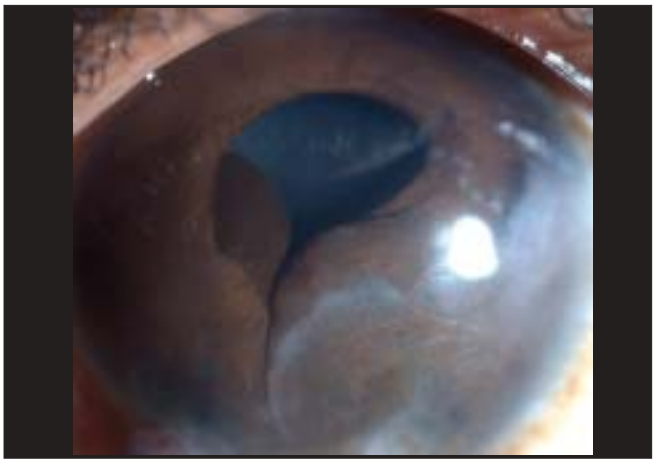

Figure 2: Slit-lamp picture of an iris cyst that developed two years following trauma with bamboo stick. The cyst extends up to the iridocorneal angle with corneal attachment. Cyst excision was done with no complications

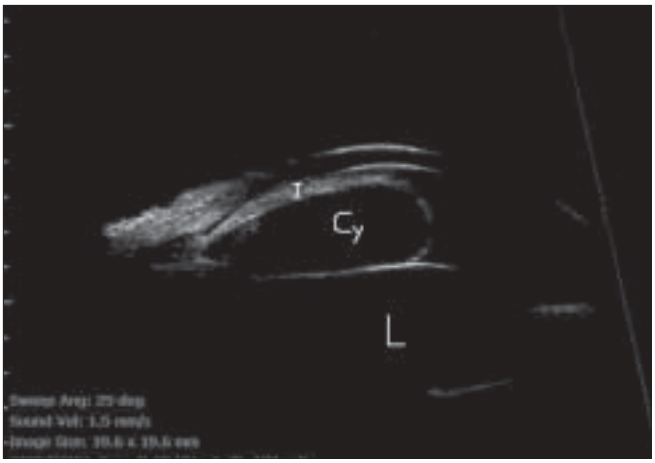

Figure 4: Ultrasound Biomicroscope (UBM) picture shows iris cyst (Cy) with corneal attachment and clear cystic cavity. Note the acoustically clear lens (L) and the anteriorly displaced iris (I)

to vision at presentation. No recurrence was noticed in any case till last follow-up.

Discussion

Two types of iris implantation cysts have been described depending upon their gross examination. The first is named as pearl or epithelial cyst which is a solid-looking cyst lined by stratified squamous epithelium having concentric lamellar layers and clear cystic space in the center. The other one is known as serous cyst.[6] It has a thin wall and is lined by stretched out and flattened atrophic epithelium containing chronic inflammatory or cellular exudates. Meanwhile, epithelial ingrowth mainly consists of avascular membrane progressing on the corneal endothelial and iris surface.[7] Treatment of epithelial ingrowth has traditionally involved aggressive excision of cellular proliferation and associated tissue as well as ablative therapy to excision site to eradicate residual cells. One of the challenges is to identify the full extent of ocular involvement by the epithelial cellular incursion, so as to treat it completely. In the present study, histopathological examination of the excised iris cyst revealed that nine cysts were epithelial or pearl cyst, and one was serous cyst. In cystic ingrowths, the tissue margins are clearly defined and readily seen during surgery. However, the best treatment is not yet determined and it is unclear whether laser treatment, surgical removal or cyst aspiration with/without laser photocoagulation/surgical removal offers the best chance of control. There have been reports of iris cysts being treated with aspiration[2] to collapse the cyst but this might lead to recurrence.[2] Some have reported success with block excision techniques.[8] As an alternative to surgical removal, laser treatment with Nd-YAG to rupture the cyst were also reported.[9,10] In the present study all cysts underwent total excision with/without iridocyclectomy. Additional surgical procedures like lensectomy, vitrectomy, penetrating keratoplasty and intraocular (IOL) removal were done, where necessary. Six (60%) cases showed no complication after treatment with good visual outcomes (mean logMAR 0.45), which was clinically significant. Three cases were of pediatric age group, less than 18 years. Two were males and

Table 3: Clinical and histopathological profile of the cysts

Age (Years)	Sex	Pre Op logMAR vision	Corneal attachment	Histology	Final logMAR Vision	Complication	Follow-up (Years)
5	F	0.77	Y	EP	0	No	0.1
43	F	1.69	N	EP	3.5	Glaucoma	7
58	M	0.17	N	EP	0.47	No	0.5
3	M	0	N	EP	0.47	No	1
34	M	0.47	Y	EP	4	GF	6
29	M	0.17	N	EP	0.30	No	1
25	F	1	N	S	2	GF	0.25
20	F	0	N	EP	0.47	No	2
22	M	0.77	Y	EP	1	No	0.75
8	M	0.60	N	EP	4	GF	5

M - Male, F - Female, Y - Yes, N - No, EP - Epithelial cyst, S - Serous cyst, GF - Graft failure 10

Table 4: Etiology and UBM features of Iris cyst

Etiology	UBM finding
Penetrating injury, following RTA	Cyst extends till root of iris and plastered to cornea, multilocular cavity
Cataract surgery	Cyst extending across entire pupil 8-10 o'clock, ciliary body detachment at 10 o'clock, cyst cavity shows discrete high reflective echoes
Cataract surgery	Cyst extending 11-1 o'clock, iris stromal cyst
Blunt trauma	Cyst extending from 6 o'clock up to the superior iris, ciliary body not involved, space in the cyst shows high reflective spots
Cataract surgery	Cyst extending from 9 to 2 o'clock, no posterior extension, wall is plastered to cornea, cyst cavity clear
Vitrectomy with cataract surgery	
Blade injury	High reflective membrane at 12 o'clock shows attachment to posterior surface of iris and no ciliary body traction
Broom stick injury	Iris cyst extending from 5-8 o' clock, may have extention up to ciliary body, lens subluxated
Cartridge injury	Iris cyst at 3 o'clock adherent to cornea, extending to the angle, intracystic space echoluscent

UBM- Ultrasound biomicroscopy, RTA- Road traffic accident

one female. The median logMAR vision was 0.60. All three underwent excision of cyst. Additionally, one case required penetrating keratoplasty. Median final logMAR acuity was 0.47. The case that underwent keratoplasty had graft failure, resulting in poor anatomical and visual outcome.

Overall, poor final visual acuity in the present study was attributable to uncontrolled glaucoma and graft failure as postoperative complications [Table 3]. One patient who underwent excision of cyst and lens removal developed uncontrolled glaucoma and three patients who underwent penetrating keratoplasty along with cyst removal developed graft failure. These four patients had mean postoperative logMAR vision of 3.37 and the remaining six patients had mean postoperative logMAR vision of 0.45, which was better than the preoperative, mean logMAR vision of 0.56 in 10 patients. It is because of very poor vision in these four patients that mean postoperative logMAR became poorer than preoperative logMAR, overall. Best visual outcomes were obtained in eyes that did not have any postoperative complications.

Traumatic iris cyst is difficult to manage and has poor visual outcomes if associated with postoperative complications. Appropriate surgical management appears to be a good treatment option in the management of such eyes.

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