

# Management of Complications of Anterior Uveitis

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**Purpose:** To study the prevalence of complications of anterior uveitis and share the experience of their management.

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**Material and Methods:** The study was conducted at Jinnah Post Graduate Medical Centre, Karachi from March 1998 to February 2003. All these patients presented in the out patient department of Jinnah Post Graduate Medical Centre. The detailed history was taken. Complete clinical examination was done to record the findings and all patients were thoroughly investigated to reach the final diagnosis. All patients were treated on the basis of their diagnosis for the underlying cause. Surgical procedures were performed where appropriate. Every patient was followed for one year within the study period.

**Results:** Forty six eyes of 32 patients were included in the study. Eighteen (56.25%) were male while fourteen (43.75%) eyes were of female patients. All patients were between 05-70 years of age (mean 37.5 years). Thirty two eyes were recognized with complications of anterior uveitis. Most common complication of anterior uveitis was cataract seen in seventeen cases (36.95%) followed by cystoid macular edema in 08 eyes (17.39%), glaucoma in 4 eyes (8.69%), exudative retinal detachment in 02 cases (4.34%) and one patient (2.17%) had developed vitreous haemorrhage. Patients were treated medically and surgically.

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**Conclusion:** Complications of anterior Uveitis can be treated safely by medical and surgical methods.

The term anterior uveitis is denoted so that iritis refers to the inflammation that is confined primarily to the iris and anterior chamber. Conversely, cyclitis describes cellular reaction within the ciliary body and anterior vitreous. The phrase anterior uveitis encompasses the term iritis, cyclitis, and iridocyclitis. The anterior uveitis is most prevalent form of intraocular inflammation. An annual incidence of 8.1 new cases/100,000 population has been reported<sup>1</sup>. No local data has yet been recorded and many cases of acute and chronic anterior uveitis go undiagnosed.

The anterior uveitis clinically can be of acute and chronic onset and can be granulomatous or non granulomatous. It can be bilateral or unilateral in presentation. Uveitis is an important cause of visual handicap and blindness in the Western world, accounting about 10 % of total blindness in the USA<sup>2</sup>. Intraocular inflammation is not different from inflammation else where. Acute inflammation may be inflicted by living or non living agents with breakdown of blood aqueous barrier and vasodilatation. Circulating leucocytes in the peripheral blood migrate into the aqueous by chemotactic factors leading to the process of phagocytosis. These chemical mediators like histamine, bradykinin, the Hageman factor, complement system, plasmin, prostaglandins and leukotrienes are released during inflammatory reaction. The sequelae of inflammation are resolution, suppuration and organization<sup>3</sup>.

It can often be treated effectively in its active phase by medication. Many complications of uveitis can be controlled by surgery or by drugs, for example, cataract and glaucoma<sup>4</sup>.

A secondary cataract can often form in association with chronic uveitis. Typically a posterior subcapsular cataract appears but anterior lens changes may also occur. Long term use of corticosteroids for the treatment of uveitis may also cause posterior subcapsular cataract<sup>5</sup>.

Multiple mechanisms have been explained about the uveitic glaucoma but it is mainly due to the trabecular blockage by the inflammatory debris<sup>6</sup>.

Cystoid macular edema (CME) is a common condition associated with intraocular inflammation, vitreoretinal traction and vascular incompetence. Different types of anterior and mainly posterior uveitis can result in CME. All these types of uveitis damage the blood-retina barrier which leads to the involvement of macula<sup>7</sup>.

This study was conducted to observe the prevalence of complications of anterior uveitis in urban Pakistani population and to share the experience of their management.

## MATERIAL AND METHODS

Forty six eyes of thirty two patients, suffering from anterior uveitis, presented in the out patient department of Jinnah Post Graduate Medical Centre, Karachi during the period from March 1998 to February 2003. All patients were registered and admitted in the hospital.

The detailed history was taken. Patient's complaints about ocular pain, redness, halos, floaters or flashes were especially noted. Questions were asked about joint pain, oral/genital ulcers, weight loss, urinary problems, chronic cough, trauma etc. Previous surgical history, drug history or history of any ocular trauma was also investigated.

Clinical examination includes general and ophthalmic examination. Ophthalmic examination was done giving special consideration to cornea for presence and appearance of keratic precipitates (KPs), anterior chamber for the presence of aqueous cells and flare as well as for hypopyon and hyphema. The pupil was examined for posterior synechiae, occlusio and seclusio papillae, iris for rubeosis and inflammatory nodules, lens for secondary cataract, optic disc, macula and blood vessels for signs of posterior segment inflammations like papillitis, cystoid macular edema, vasculitis etc. General physical examination was performed to check the presence of any systemic disease in relation with ocular inflammation.

All patients were thoroughly investigated to reach a final diagnosis. A list of general and specific laboratory tests was designed to investigate these patients. General tests include complete blood count (CBC), Erythrocyte sedimentation rate (ESR), blood sugar level, urine examination and stool examination. Disease specific tests include anti nuclear antibodies profile (ANA), RA factor, X-ray sacroiliac joint for ankylosing spondylitis, X-ray knee and small joints for juvenile chronic arthritis, barium studies for inflammatory bowel disease, angiotensin converting enzyme level (ACE), lung and conjunctival biopsy for sarcoidosis, X-ray chest for sarcoidosis and tuberculosis, tuberculin test for tuberculoid disease, Skin (Pathergy) test for Behcet's disease, FTA-Abs (Fluorescent treponemal antibody absorption test) and MHA-TP and TPHA (Haemagglutination tests for

Treponema pallidum) to diagnose syphilis<sup>8</sup>. Fundus fluorescein angiography (FFA) played important role for the diagnosis of posterior segment pathologies like cystoid macular edema.

Patients were treated on the basis of their diagnosis for the underlying cause. Idiopathic cases were managed with steroids and cycloplegics. Most of the cases improved with appropriate treatment. All patients were followed at regular interval and during those follow up visits.

Thirty two eyes were noted to have complications during their follow up period. Most of the patients came with defective vision due to cataract. Few cases of early cataract improved with refraction and they were prescribed glasses. Rest of the cases was treated surgically.

Surgical procedure for cataract was performed under retrobulbar anesthesia when uveitis was inactive or under control with medications for at least three months before surgery. Topical corticosteroids were given to the patients along with antibiotics three days before surgery<sup>9</sup>. Phacoemulsification was performed on four eyes with implantation of acrylic foldable intra ocular lenses within the capsular bag. Five cases were operated by extra capsular cataract extraction with implantation of PMMA IOLs. Corneal incision was used to enter the anterior chamber in all cases and three 10/0 nylon stitches were applied to close the incision. Sub-tenon dexamethasone/gentamycin injection was given at the end of the surgery. Post operative examination was done at day 1, one week, one month, six months and then one year. Wound stability, anterior chamber reaction, presence of any pupillary membrane or posterior synechiae and refractive status of the eye was checked on each follow up.

Trabeculectomy with Mitomycin C was done in two patients where medical treatment was failed to treat uveitic glaucoma. Cystoid macular edema was treated with topical prednisolone acetate 1% every 2 hours for three weeks. In addition, severe and non responsive cases to topical steroids were treated with sub-tenon injections of triamcinolone (40 mg) at one month interval for three months. Oral acetazolamide 500 mg/day was considered as adjunct to topical corticosteroids in persistent cases of cystoid macular edema<sup>11</sup>.

Intravenous steroids injections were given to the patients with exudative retinal detachment and vitreous haemorrhage (Table 4).

## RESULTS

Forty six eyes of thirty two patients were screened. Eighteen (56.25%) were of male while fourteen (43.75%) eyes were of female patients. All patients were between 05-70 years of age with mean age of 37.5 years (Table I). Most of the patients presented between the ages of 21-30 years. Eighteen patients (56.25%) presented with unilateral uveitis and fourteen were bilateral cases (43.75%) (Table I).

Out these 46 eyes, 32 presented with complications. Cataract was the most common complication seen in seventeen eyes (36.95%). Second common complication was cystoid macular edema which developed in eight eyes (17.39%), four eyes (8.69%) were diagnosed with glaucoma, two eyes (4.34%) developed exudative retinal detachment and one eye (2.17%) developed vitreous haemorrhage (Table 2).

Visual acuity was recorded before and after treatment. Before treatment, nine eyes were 6/60 or less, eight were at 6/36 vision, nine at 6/24 and six eyes presented with 6/12 vision (Table 3).

After appropriate treatment, eleven eyes reached the maximum vision of 6/9, six eyes improved up to 6/12, one on 6/18 and seven up to 6/24. Three eyes remained on 6/36 and four eyes were lost due to uncontrolled complications and severity of the disease because of the late presentation (Table 3).

**Table I:** Patients' data n=32

<b>Gender</b> Male/Female	18/14
Mean Age	37.5 Years
Laterality	
Unilateral	18 (56.25%)
Bilateral	14 (43.75%)

**Table 2:** Common complications of anterior uveitis n=32

<b>Complications</b>	<b>No. of eye n (%)</b>
Cataract	17 (36.95)
Cystoid macular edema	8 (17.39)
Glaucoma	4 (8.69)
Exudative retinal detachment	2 (4.34)
Vitreous haemorrhage	1 (2.17)

Three patients of cataract improved up to 6/9 and five to 6/12 with refraction and they were prescribed glasses. Five cases were mature cataract and operated by extra capsular cataract extraction with rigid intra-ocular lens implantation, while four cases were operated by phacoemulsification with implantation of foldable intraocular lens.

Cystoid macular edema was treated with topical and sub-tenon corticosteroids and oral acetazolamide. Three out of eight cases, improved one line on Snellen chart after treatment. Two patients of glaucoma

**Table 3:** Visual Acuity before and after treatment in eyes with Complications n=32

Visual acuity	Cataract		Cystoid macular edema		Glaucoma		Exudative retinal detachment		Vitreous haemorrhage	
	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op
6/60 or Less	05				01	01	02	02	01	01
6/36	02		06	03						
6/24	05		01	04	03	03				
6/18	05		01	01						
6/12		06								
6/9		11								

**Table 4:** Management of complications of anterior uveitis. No. of cases n=32

<b>Surgical</b>	ECCE with IOL	05	34.4%
	Phacoemulsification With IOL	04	
	Trabeculectomy with MMC	02	
<b>Medical</b>	Refraction	08	65.6%
	Steroids (Topical & subtenon) for CME	08	
	Anti - glaucoma medicines	02	
	Intravenous Steroid therapy for exudative RD & vitreous haemorrhage	03	

responded well to medical therapy. Their intra-ocular pressure was controlled and visual fields were satisfactory. Two cases (4.34 %) of uncontrolled glaucoma were operated by filtration surgery with Mitomycin C (Table 4).

Out of two cases (4.34 %) operated for glaucoma by filtration surgery with Mitomycin C, one eye showed worse surgical outcome after MMC application and went into hypotony. Second surgically treated eye developed rise in intra ocular pressure after one year (Table 4).

Two eyes developed exudative retinal detachment and these were treated with injection of dexamethasone 12 mg intravenous once a day with oral Cimetidine 400 mg twice a day.

After two weeks, the retina was flat with leopard like appearance i.e hypo pigmented areas surrounded by hyper pigmentation especially at posterior pole. One eye had vitreous haemorrhage which was revealed on B-scan. The cause of vitreous haemorrhage was obscure. These three eyes did not improve due to their late presentation.

## DISCUSSION

Formation of secondary cataract is not an uncommon complication of chronic anterior uveitis. These are typically posterior subcapsular cataracts but calcium deposits may be observed on the anterior capsule or within the lens substance. In addition, cataracts have also been reported following prolonged treatment of

uveitis with corticosteroids<sup>5</sup>. Outcome of surgical correction of these cases is sometimes different from routine cataract surgeries. Although these cases may not be associated with severe uveitis in the early postoperative period but mild anterior segment inflammation settles over the period of time. To avoid such problems, it is recommended to perform surgery when uveitis is not active or controlled with medication for at least two to three months prior to the procedure. Topical steroids should be started before surgery. Ensure the implantation of IOL in the capsular bag to prevent iris adhesions with IOL<sup>9</sup>.

In our study, seventeen eyes (36.95%) developed complicated cataract within 3-7 months of diagnosis. Eight cases of immature cataract improved one line on Snellen's chart by refraction and they were prescribed glasses. Nine cases were treated surgically. Eight (88.88%) out of nine operated cases improved up to 6/9 vision (BSCVA) within two months while one eye achieved vision of 6/12.

Tejwani et al found that in complicated cataracts, 88.3% patients achieved a BSCVA of 6/9 or better after surgery<sup>12</sup>. The study also says that it is safe to perform

ECCE or phacoemulsification with intraocular lens implantation in cases of complicated cataract especially secondary to Fuchs' heterochromic cyclitis. It is best to treat active uveitis and then keep the patients on topical corticosteroids prior to the surgery to avoid severe attacks of inflammation post operatively.

Many eye disorders become complicated due to the development of cystoid macular edema (CME). Uveitis is one of those eye diseases in which cystoid macular edema reduces visual acuity. A multitude of ocular inflammation and infections can lead to CME. These include idiopathic uveitis, intermediate uveitis, birdshot retinochoroidopathy, posterior scleritis, sarcoidosis, toxoplasmosis and Behcet's disease. The common underlying cause is an inflammatory mediated breakdown of blood-retinal barrier<sup>7</sup>.

Lardenoye et al, found cystoid macular edema as the major cause of visual loss in uveitis especially among elderly patients and those with chronic disease except in HLA-B27 associated uveitis where its role is minimum<sup>13</sup>. In our study, 37.5% eyes had improvement of one line on Snellen's chart while 62.5% eyes did not show any response to the treatment.

The relationship between the levels of IOP and inflammation is complex. Trabecular meshwork obstruction is the most common mechanism, for which many causes may potentiate one another. First the accumulation of white blood cells (especially macrophages and activated T lymphocytes), or their aggregations which may later form peripheral anterior synechiae and results in subsequent closed-angle glaucoma. Second obstruction may arise from inflammatory debris such as proteins, fibrin etc. Besides physical obstruction, these products increase aqueous viscosity, which may raise IOP. Third swelling of trabecular lamellae and endothelial cells may occur, with both physical narrowing of trabecular pores and dysfunction. Finally, loss of and/or damage to the trabecular endothelial cells may become irreversible, with or without lamellar scarring. This results in permanent reduction in conventional outflow<sup>6</sup>.

The initial treatment of uveitic glaucoma is medical therapy. Filtration procedures are indicated when glaucomatous eye does not show response to medical treatment. Glaucoma associated with uveitis is well known to carry a high risk of surgical failure. The results of unaugmented trabeculectomy surgery appear to be effective in the initial post operative period but the risk of failure is present over the long term. Recently, the antiproliferative agent (Mitomycin C) has been suggested as an adjunct in trabeculectomy in high risk cases such as uveitic glaucoma, eyes with previous history of ocular surgery, aphakic and pseudophakic eyes<sup>14</sup>. In our experience, patients who responded well to medical therapy had their intra ocular pressure within normal limits but patients treated surgically with antiproliferative agent demonstrated worse surgical outcome. One eye went into hypotony and second developed raised IOP within one year of surgical intervention. Noble et al<sup>14</sup> had the same experience in uveitic glaucoma patients who were treated surgically by trabeculectomy with the use of antiproliferative agent.

Late presentation with complications was found to be another reason leading to lack of visual improvement and then ending up with blindness.

Eyes with exudative retinal detachment were treated with steroids but the response was not adequate. Although retina was flat but the appearance was not healthy. It was full of hypo and hyper pigmented areas at the posterior pole. One eye presented with vitreous haemorrhage which led to fibrosis in vitreous cavity and tractional bands pulling the retina from its normal position.

Uveitis is an important cause of visual handicap and blindness all over the world in case of late presentation or lack of follow ups. It can often be treated effectively in its active phase by medication but many complications of uveitis can be controlled by surgery for examples, cataract and glaucoma.

## CONCLUSION

In conclusion, the study proves that, in this part of the world, the most common complication of anterior uveitis is cataract followed by cystoid macular edema, secondary glaucoma, exudative retinal detachment and vitreous haemorrhage. These complications can be effectively treated by medical or surgical ways. Blindness could be a possible outcome if patients present late in the disease course.

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