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# Al-Shifa Journal of Ophthalmology

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Vol. 13, No. 3, July – September 2017

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**QUARTERLY PUBLISHED**

Logo

- **Editorial: Immunosuppressant Drugs and Ocular Inflammation**
- **Clinical audit during a glaucoma fellowship program**
- **Role of B-Scan in evaluating posterior segment**
- **Compliance of spectacles wear in school going children**
- **Barriers for spectacle users in choosing contact lens**
- **Effectiveness of cyclosporine-A eye drops for allergic conjunctivitis**
- **Post-operative complications after reconstruction of contracted socket**
- **Congenital cystic eye ball with an intracranial anomaly – Case Report**

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# Al-Shifa Journal of Ophthalmology

A Journal of  
Al-Shifa Trust Eye Hospital, Rawalpindi

**Aims and Scope:** ASJO, The official journal of Al-Shifa Trust Eye Hospital, Rawalpindi, publishes original reports of research in Ophthalmology mostly in the form of clinical studies. Topics may include new diagnostic and surgical techniques, treatment methods, atypical case reports, major and mini-reviews, preventive ophthalmology including health economics and applied research findings.

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## Al-Shifa Journal of Ophthalmology

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<p><b>Role of B-Scan in Evaluating Posterior Segment Pathologies in Opaque Ocular Media</b> <i>Fariha Taimur, Tehmina Nazir, Badruddin Athar Naeem</i></p> <p>This study was conducted at the Ophthalmology department, Fauji Foundation Hospital to determine the diagnostic accuracy of B-scan ultrasonography in detecting posterior segment pathologies in patients of dense cataract, keeping postoperative funduscopy findings as a gold standard. Total 333 patients were included in the study according to the inclusion criteria of the study. The sensitivity and specificity of B-scan ultrasonography in detecting posterior segment pathologies was 91.67% and 100% respectively.</p>	<b>121</b>
<p><b>Compliance of spectacles wear in School going children in District Rawalpindi</b> <i>Ishtiaq Suleri, Saman Waqar</i></p> <p>This cross-sectional study was conducted to report the compliance of spectacles use and determine the reasons of non-compliance among school going children in District Rawalpindi. Sample comprised of 441 students who had been prescribed spectacles for constant wear during school screening</p>	<b>127</b>

<p>program done by Al-Shifa Trust. Information on age, gender, school system, type of refractive error etc. was collected and analyzed to find the association of different factors with compliance of the respondents. The compliance rate was found to be 41%.</p>		
<p><b>Barriers for spectacle users in choosing contact lens as an alternative vision correction method</b>  <i>Shamsa Sarwar, Tayyab Afghani, Saman Waqar</i></p> <p>This cross-sectional study was conducted to report the barriers for spectacle users in using contact lenses as an alternative vision correction method and to analyze their preferences regarding known vision correction tools. The study included 350 spectacle wearers; out of which 238 were females and 112 were males with mean age of 21.15±3.57. The major barrier found towards contact lens use among spectacle users was fear of side effects (65.3%) and inconvenience of its use (54.6%), followed by care and maintenance (52.4%).</p>		133
<p><b>Effectiveness Of 0.05% Cyclosporine-A Eye Drops for Allergic Conjunctivitis in Terms of Improvement in Ocular Itching Score</b>  <i>Muhammad Sajid, Hussain Ahmad, Maqsood Ahmad, Ubaidullah</i></p> <p>This study was conducted in the department of Ophthalmology, Khyber Teaching Hospital Peshawar from July 2015 to Jan 2016 to determine the efficacy of 0.05% Cyclosporine-A eye drops for allergic conjunctivitis in terms of improvement in ocular itching score. A total of 259 patients were included; mean age was 17 years with SD ± 3.38. Cyclosporine-A was effective in 228(88%) patients and was not effective in 31(12%) patients.</p>		139
<p><b>Post-Operative Complications After Reconstruction of Contracted Socket Using Amniotic Membrane</b>  <i>Tehmina Nazir, Fariha Taimur</i></p> <p>This quasi-experimental was conducted to report the rate of post-operative complications after reconstruction of contracted socket using amniotic membrane. Amniotic membrane used in study was prepared at Al Shifa Trust Eye Hospital. Reconstructive surgery and amniotic membrane transplantation was performed by same surgeon under GA. Patients were followed up in outpatient department for 3 months to observe the post-operative complications. The study concluded that amniotic membrane grafting gives cosmetically and functionally acceptable results with minimal post-operative complications.</p>		145
<p><b>Congenital cystic eye ball with an intracranial anomaly: A Case Report</b>  <i>Maheen Akbar, Amna Manzoor, Sunday Okonkwo</i></p> <p>A 3 months old female child presented to Al-Shifa Trust Eye Hospital with abnormal protrusion from the left orbit since birth which increased gradually in size. The mass was cystic in consistency, non-tender, non-pulsatile and transilluminated light. No eyeball could be identified. MRI brain and orbit revealed a cystic orbital mass with complete agenesis of corpus callosum,</p>		153

with no other associated brain anomaly. Her systemic evaluation was unremarkable at 3 months. Routine haematological and biochemical tests were also normal.

**EDITORIAL**

## **Immunosuppressant Drugs and Ocular Inflammatory Conditions**

Muhammad Sadiq

Ocular inflammatory conditions can result in the severe visual impairment and ocular morbidity. Such inflammatory conditions can be effectively treated by corticosteroids. However, due to high potential of local or systemic side effects, their use may be restricted especially in long term use. Due to the reason, immunosuppressant drugs are now increasingly used to treat ocular inflammatory conditions. The primary objectives of the immunosuppressant drugs are to control inflammation in case of corticosteroids failure, to prevent toxicity associated with corticosteroids use and to treat corticosteroids unresponsive high-risk uveitis syndrome.

There are four categories of immunosuppressant drugs in ocular use today.

- 1- Antimetabolites which include methotrexate, mycophenolate mofetil (MMF) and azathioprine
- 2- T-cell inhibitors which include cyclosporine, tacrolimus or sirolimus
- 3- Alkylating agents which include cyclophosphamide and chlorambucil
- 4- Biologic agents which include tumor necrosis factor (TNF) inhibitors (infliximab, etanercept and adalimumab), lymphocyte inhibitors and interleukin inhibitors<sup>1</sup>.

The antimetabolite agents are effective as corticosteroid-sparing drugs in the treatment of many ocular inflammatory diseases. In 1965, methotrexate was first time utilized to treat ocular inflammatory diseases. Methotrexate is folate antagonist and competitively inhibits dihydrofolate reductase and ultimately inhibits cell growth and proliferation by the depletion of reduced folates which are essential for the synthesis of nucleic acid. Therefore, during the S-phase of the cell cycle methotrexate shows a greater cytotoxic effect on the rapidly proliferating cells. Methotrexate therapy is indicated in almost all types of ocular inflammation, including anterior, intermediate, posterior, and panuveitis, retinal vasculitis, scleritis, childhood chronic uveitis, and mucus membrane pemphigoid. Other specific indications include Behçet disease, birdshot chorioretinopathy, multifocal choroiditis with panuveitis, sarcoidosis, Vogt-Koyanagi-Harada disease, and sympathetic ophthalmia. In addition, complications associated with chronic uveitis such as macular edema, choroidal neovascularization, and optic disc edema can be treated with methotrexate<sup>2</sup>.

Mycophenolate mofetil is an inosine monophosphate dehydrogenase inhibitor and act by disrupting purine synthesis, and preferentially inhibits DNA synthesis by B- and T-cells. It is given orally at a starting dose of 500 mg twice daily, and is

increased to 1 g twice daily after 2 weeks provided that side effects are acceptable with regular monitoring of blood count and liver-function tests<sup>3</sup>.

T lymphocytes inhibitors like tacrolimus and cyclosporine, recently have been used as an alternative treatment option for inflammatory diseases of the eye including ocular allergic crises because of their efficacy and favorable safety profile. Tacrolimus is an immunosuppressant agent which belongs to macrolides family. Its mode of action is to decrease the inflammatory mediator's production by T lymphocytes through the inhibition of calcineurin<sup>4</sup>. It is 10-100 times more potent than cyclosporine and less likely to cause systemic hypertension & dyslipidemia. Various studies revealed the efficacy of tacrolimus in ocular allergic conditions, corneal graft rejection, inflammatory conjunctival and corneal diseases, uveitis, and graft-versus host disease<sup>5</sup>.

Cyclosporine A is a highly specific immunomodulator that affects primarily T lymphocytes. It can be used to treat dry eye syndrome in patients having insufficient tears production and keratoconjunctivitis sicca. Studies showed a significant reduction in the levels of both inflammatory cells and markers in the conjunctival epithelium with a prominent increase in goblet cells and no systemic side effects were noted. Cyclosporine has a wide safety profile because it does not inhibit wound healing or produce lens changes<sup>6</sup>.

Cyclophosphamide is an alkylating agent and it exerts its cytotoxic effect on rapidly proliferating cells by alkylating nucleophilic groups on DNA bases. As a result of this, it causes cross-linking of DNA bases, abnormal base pairing, and strand breakage. These cytotoxic effects are thought to cause immunosuppressive effects. It can be used orally or intravenous pulses. According to protocols set in UK,

it can be administered by intravenous infusions at an initial dose of 12, 4, 7, 10, and 13 weeks, with monthly infusions thereafter to a maximum of nine pulses.

Chlorambucil has a similar action to cyclophosphamide. It is orally administered at a starting dose of 0.1 mg/kg/day to a maximum dose of 6–12 mg/day. Therapeutic efficacy is usually achieved within 4–12 weeks of onset, but it is less predictable than that of cyclophosphamide.

Infliximab is a chimeric immunoglobulin (Ig) G monoclonal antibody that binds to TNF $\alpha$  and inhibits its biological function. It is composed of a human constant region, and murine variable region. As is common to all anti-TNF $\alpha$  therapy, patients with evidence of acute infection are excluded from treatment, and, prior to commencing treatment, all patients should be screened.

Etanercept comprises a soluble TNF receptor and a human IgG Fc fragment, which is able to block the activity of both TNF $\alpha$  and TNF $\beta$ . It is administered subcutaneously twice per week at a typical dose of 25 mg<sup>3</sup>.

Other agents like Adalimumab, Rituximab, Abatacept, Daclizumab, Interferons (IFNs) etc. can also be used to treat ocular inflammatory conditions including uveitis. Numerous agents are under study and research is going on. Therapeutic agents are very rarely developed for the primary purpose of treating ocular inflammatory disease; instead, most advances in treatment occur when drugs previously used to successfully manage systemic inflammatory diseases are adapted for use in ophthalmology.

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## Clinical Audit of Patients Presenting at Department of Glaucoma as Part of Glaucoma Fellowship Program

Yousaf Jamal Mahsood<sup>1</sup>, Muhammad Naeem<sup>2</sup>, Hussain Ahmad<sup>3</sup>, Irfan Ullah<sup>4</sup>, Saima Farooq<sup>2</sup>, Farah Akhtar<sup>4</sup>

### ABSTRACT

**Aims:** To determine the different types and outcome of glaucoma presented during one-year glaucoma fellowship.

**Study Design:** Observational cross-sectional study.

**Subjects and Methods:** This study represents the clinical experience of a fellow during one-year glaucoma fellowship at Glaucoma clinic of Al-Shifa Trust Eye Hospital, Rawalpindi. The duration of this study was one year i.e. from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2016 and 2728 eyes of 1440 patients were included. Type of glaucoma, intraocular pressure (IOP), ocular or systemic associations was recorded and management plan was devised under the close supervision of glaucoma faculty.

**Results:** Of total 1440 patients examined, 966 (67.09%) were males and 474 (32.91%) were females. New patients examined by the fellow were 255 (17.7%) and 1185 (82.3%) were on their follow-up schedule. Primary open angle glaucoma was the most common type and was diagnosed in 868 (31.61%) eyes followed by pseudoexfoliation glaucoma in 408 (14.95%) and glaucoma suspects in 306 (11.21%) eyes. On presentation to OPD, 2304 (84.45%) eyes had controlled IOP either with medicines or surgery and 424 (15.54%) were uncontrolled. Medical treatment was the most common mode of treatment given to 1740 (63.78%) eyes followed by observation in 636 (23.3%) and trabeculectomy in 161 (5.9%) eyes.

**Conclusion:** Primary Open angle glaucoma was the most common type of glaucoma presented at glaucoma clinic however pseudoexfoliation syndrome is also a common type of glaucoma in this region. *Al-Shifa Journal of Ophthalmology 2017; 13(3): 114-20.* © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

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1. Pak International Medical College, Peshawar.
  2. Hayatabad Medical Complex, Peshawar.
  3. Khyber Teaching Hospital, Peshawar.
  4. Al-Shifa Trust Eye Hospital, Rawalpindi.
- 

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### Correspondence to:

Dr. Yousaf Jamal Mahsood,  
Assistant Professor,  
Pak International Medical College,  
Peshawar.  
E-mail: yousaf82@hotmail.com

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### Introduction:

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Glaucoma is the leading cause of irreversible blindness worldwide and it is expected that about 80 million people will be affected from it by 2020.<sup>1,2</sup> As the healthcare is improving and new diagnostic technologies are emerging we are facing some good number glaucoma patients which could have been gone undetected. But, with so much advancement still it is said that even in advanced countries more than 50% of glaucoma patients remain undetected while in underdeveloped countries this figure raises to 90%.<sup>2,3</sup> This means that with an ideal screening program we will be diagnosing more than twice of the patients than we are dealing now in our country. This is certainly going to increase burden on our existing glaucoma specialists as well as general ophthalmologists who are practicing in rural areas. From our experience (unpublished data) we have find that about 31% of our glaucoma patients are being referred to us by ophthalmologists from different areas. This urges us to encourage more ophthalmologists to get trained in glaucoma specialty to improve the care of sufferers.

Glaucoma fellow is the term used when a qualified ophthalmologist after a minimum four years of residency in ophthalmology starts clinical fellowship in glaucoma specialty under supervision of renowned faculty. One year glaucoma fellowship is a recognized program worldwide after which glaucoma fellow is called as glaucoma specialist (GS). Our institute is the only institute in the country which offers such program. Its busy out-patient and in-patient department is a great experience for the fellow to achieve goal of diagnostic and treatment expertise necessary for a GS. In this study we look in to the experience gained by a glaucoma fellow during his one year stay at out-patient of glaucoma clinic. This study will be able to demonstrate the process of evolution of GS and probably may help in

future to set some standards required for a person who can practice glaucoma.

### **Subjects and Methods:**

This study was conducted at out-patient department (OPD) of glaucoma clinic of Al-Shifa Trust Eye Hospital, Rawalpindi from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2016 during one-year glaucoma fellowship. This study highlights the experience gained by a fellow in this duration. There were mainly two types of patients who presented to the OPD: New and Follow-up. The glaucoma fellow examined every patient and visual acuity, intraocular pressure, gonioscopy, optic disc examination, automated visual fields and optical coherence tomography of retinal nerve fiber layer for each eye was recorded and a management plan devised. Those eyes whose IOP were within normal limits and no progression of glaucoma detected were advised to continue with the therapy and those whose IOP was not controlled or exhibited signs of progression were advised management plans with consultation of glaucoma supervisor. All eyes were classified on the basis of angle morphology and diagnoses were made. Ocular and systemic associations were also confirmed and recorded. The data was analyzed on SPSS version 17 software, percentages and means were presented in form of tables and figures.

### **Results:**

Of total 1440 patients examined, 966 (67.09%) were males and 474 (32.91%) were females with mean age of 51.02 (02-88) years. New patients examined by the fellow were 255 (17.7%) and 1185 (82.3%) were on their follow-up schedule (Table I). Among 2728 eyes of 1440 patients, 2304 (84.45%) eyes had IOP controlled on the visit. On presentation, average IOP was 16.31 (02-70) mm of Hg and mean Cup: Disc (CDR) was 0.91 (0.1-1.0). Open angles were identified in 1985 (72.76%) eyes, closed angles in 536 (19.64%), occludable angles in 31 (1.13%)

and angles not identifiable due to hazy media in 176 (6.45%) eyes (Figure 1). A total of 318 (11.65%) eyes had already undergone trabeculectomy in which 105 (33.01%) were cases of Primary open angle glaucoma (POAG) and 96 (30.1%) were diagnosed cases of Pseudoexfoliation glaucoma (PXE). POAG was the most common

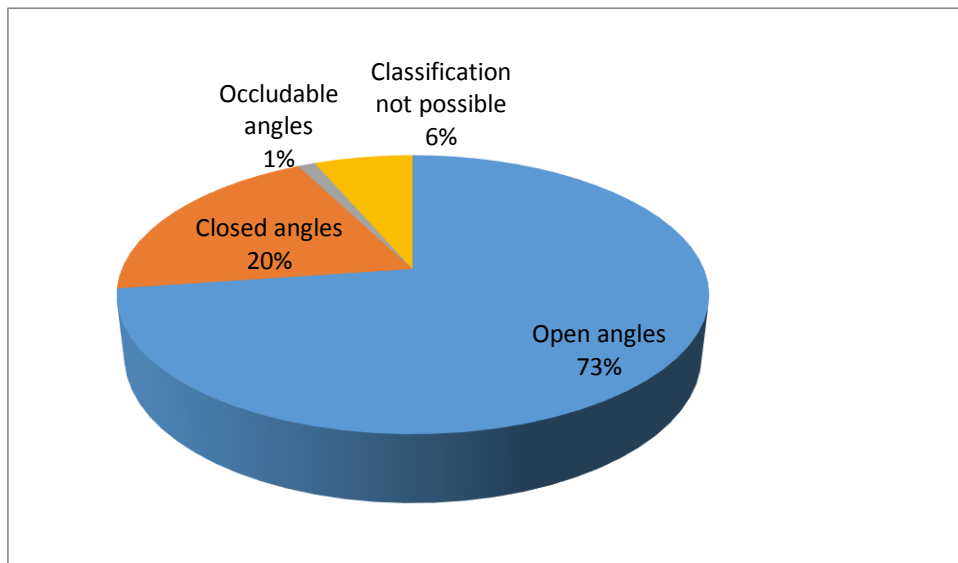
868 (3.45%) eyes had already undergone trabeculectomy in which 105 (33.01%) were cases of Primary open angle glaucoma (POAG) and 96 (30.1%) were diagnosed cases of Pseudoexfoliation glaucoma (PXE). POAG was the most common

408 (15.54%) eyes had already undergone trabeculectomy in which 105 (33.01%) were cases of Primary open angle glaucoma (POAG) and 96 (30.1%) were diagnosed cases of Pseudoexfoliation glaucoma (PXE). POAG was the most common

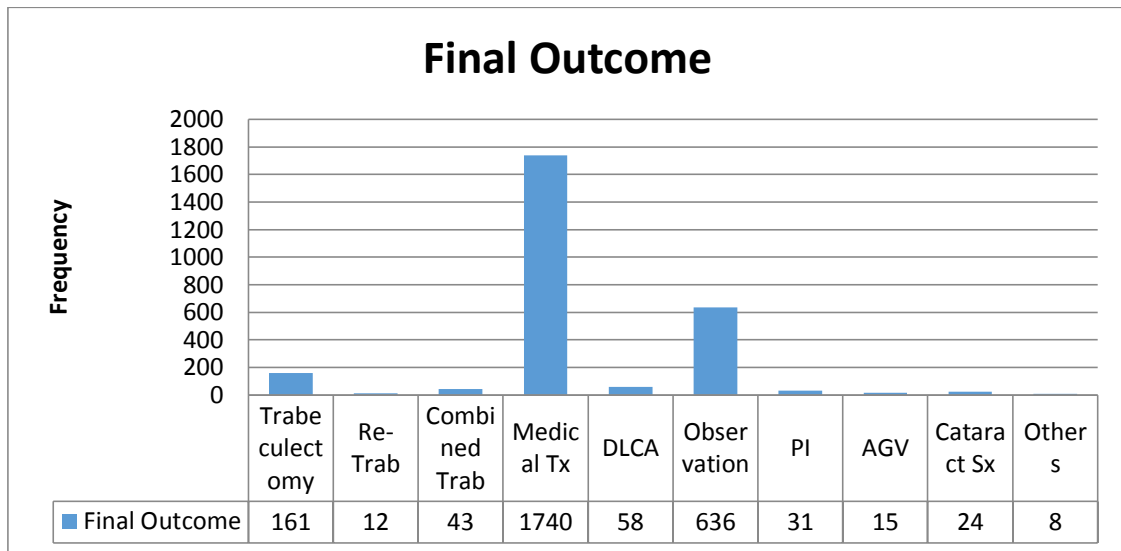
306 (11.21%) eyes (Table II). On presentation to OPD, 2304 (84.45%) eyes had controlled IOP either with medicines or surgery and 424 (15.54%) were uncontrolled. Medical treatment was the most common mode of treatment given to 1740 (63.78%) eyes followed by observation in 626 (23.20%) and

**Table I: Patients information**

Gender	Male (%) <b>966 (67.08)</b>	Female (%) <b>474 (32.91)</b>
New patients (%)	255 (17.7)	
Follow-up patients (%)	1185 (82.3)	
Age in years	51.02 (02-88)	
Cup: Disc Ratio	0.91 (0.1-1.0)	
IOP in mm of Hg	16.31 (02-70)	



**Figure 1: Angles Categorization of patients**



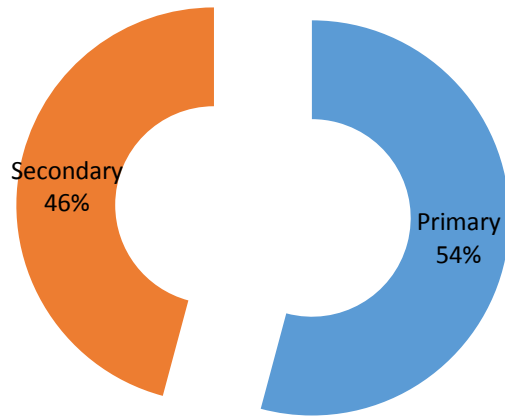
DLCA= Diode laser cycloablation, PI= Peripheral Iridotomy, AGV= Ahmed Glaucoma valve  
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**Figure 2: Treatment plan of all eyes**

**Table II: Diagnosis of eyes examined.**

Diagnosis	Eyes (n)	Diagnosis	Eyes (n)
Absolute Glaucoma	41	Normal Tension Glaucoma	18
Traumatic Glaucoma	19	Neovascular Glaucoma	78
Aniridia	18	Primary Angle Closure Suspect	31
Aphakic/Pseudophakic Glaucoma	70	Ocular Hypertension	36
Bleb Related Complications	06	Neurological Disc Damage	26
Cataract	12	Primary Angle Closure Glaucoma	220
Congenital Glaucoma	20	Primary Open Angle Glaucoma	864
Juvenile Glaucoma	122	Pseudoexfoliation Glaucoma	408
Glaucoma Suspect	306	Refractory Glaucoma	12
Hypotony	05	Secondary Angle Closure Glaucoma	60
Herpetic Glaucoma	05	Secondary Open Angle Glaucoma	105
ICE Syndrome	07	Steroid Induced Glaucoma	160
Reiger's Syndrome	08	Steroid responders	20
Uveitic Glaucoma	51		

## Etiological Classification



**Figure 3: Primary Vs. Secondary Glaucoma presenting to OPD.**

## Discussion:

Clinical fellowship in glaucoma curriculum developed by Association of University Professors of Ophthalmology Fellowship Compliance Committee (AUPO FCC) which is widely accepted as a standard is one-year program after completing residency after which a fellow is called glaucoma specialist (GS).<sup>4</sup> During this period fellow is supposed to work under supervision and involved in academic as well as research activities of the department. Our glaucoma clinic provides a great opportunity to the fellow whether it is in out-patient / in-patient department or research work. More than 40,000 diagnosed cases of glaucoma are registered with this department and are under treatment for more than two decades. This article describes the experience gained by a fellow in out-patient of glaucoma clinic during one-year fellowship.

According to curriculum developed AUPO FCC, a fellow must examine 1000 patients in one year among which at least 150 should be new patients. Our fellow examined 1440 patients among which 255 (17.7%) were new and 1185 (82.3%) were follow-up patients (Table I). A total of 2728 eyes were examined which is a great experience when such a number of patients are examined and managed while being constantly supervised by the expert faculty.

Most of the eyes examined i.e. 1985(73%) had open angles while closed angles were found in 536 (20%), occludable angles in 31 (1%) and in 176 (6%) patients angle classification could not be possible due to hazy media. This reflects that open angle glaucomas are the most frequent than others. Primary open angle glaucoma (POAG) was the most common diagnosis made in about 868 (31.61%) eyes. Globally POAG represents up to 23.2% of total glaucoma cases which is less in number as to observation of our glaucoma fellow.<sup>5,6</sup>

This may be because while dealing in glaucoma clinic most of the undetected POAG is diagnosed and affect the figures. Pseudoexfoliation Glaucoma (PXF-G) was the second most common diagnosis and was found in 408 (14.95%) of total eyes examined. It is established fact that PXF-G is the most common (20-25%) identifiable cause of open angle glaucoma.<sup>7</sup> In this study we found that PXF-G contributes 20.55% of open angle glaucoma which is a very high figure because it is thought to be an entity more common in Scandinavian countries. This shows that ethnicity is not the only factor responsible and there may be other factors which can be related to PXF-G. As more diagnostic tools for diagnosing glaucoma are evolving we are facing more number of patients who have suspicious optic disk or IOP but not confirmed by any diagnostic tool and we label them as glaucoma suspects. Glaucoma suspects were the third most common type of patients which our fellow faced in OPD. A study conducted by our department in 2007 reported that 6.5% patients presented to glaucoma clinic were glaucoma suspects<sup>8</sup> but now after about a decade these figures have risen to 11.21% which is almost double of the previous figures. One must wonder, whether it is a good sign or bad? Well we think it is good in a sense that being glaucoma suspect is far better than being glaucoma patient as it has less psychological, social and economic burden on the individual.

Primary angle closure glaucoma (PACG) examined by fellow was present in 220 (8.06%) eyes and was the most frequent (41%) cause of closed angles. Occludable angles or primary angle closure suspects (PACS) are those whose angles are closed at least 180 degrees and open by indentation. They are more prone to PACG if not treated early by laser peripheral iridotomy (PI). In our fellow's experience he found 31 such cases which were then treated prophylactically with PI.

Among secondary glaucomas, steroid induced glaucoma (SIG) was most commonly seen after PXF-G and was observed in 160 (5.8%) eyes. Twenty (0.7%) eyes were steroid responders and their IOP came to baseline when steroids were stopped. Akhtar et al<sup>8</sup> reported in 2007 that 0.62% of their OPD patients were diagnosed as SIG in the same institution; this figure has increased enormously in our study which is alarming. Patient education and health personnel awareness regarding extravagant use of steroids is necessary to avoid injudicious use which can cause ocular problems.<sup>9</sup> While patients are receiving steroids for any medical disease, they should be observed for its side effects on eyes especially SIG. Steroid responder or positive family history are the non-modifiable risk factors and in these patients GS must be vigilant. Systemic associations like Weill Marchesani, Marfan's, Reiger's syndrome, Acromegaly and Juvenile Idiopathic arthritis while ocular entities like aniridia and ICE syndrome were also examined by our fellow.

The most frequent treatment plan made was medical treatment (anti-glaucoma medication) given to 1740 (63.78%) eyes in comparison to observation (no treatment) which was advised to 636 (23.3%) eyes. Most common surgical procedure was trabeculectomy which was advised to 161 (5.9%) eyes. When this was compared to our published data from the same institution, we found that trend of advising trabeculectomy surgery has decreased in last 10 years from 10.1% to 5.9% while observation (no treatment) plan has tremendously increased from 7.3% to 23.3%. This may be because either we are facing more glaucoma suspects or success of trabeculectomy surgery at our institution has increased and we are just following them for any progression. Proper follow-up schedule is a necessary element in management of

glaucoma and is helpful for our fellow to gain the required experience. Our experience will add to the information previously published studies in our region<sup>8, 10, 11</sup> and will help to assess the burden of glaucoma in our setup.

#### **Conclusion:**

Primary open angle glaucoma is the most common glaucoma that presents and medical treatment is the most common treatment modality used in glaucoma clinic.

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# Role of B-Scan in Evaluating Posterior Segment Pathologies in Opaque Ocular Media

Fariha Taimur<sup>1</sup>, Tehmina Nazir<sup>2</sup>, Badruddin Athar Naeem<sup>2</sup>

## Abstract

**Objective:** To determine the diagnostic accuracy of B scan ultrasonography in detecting posterior segment pathologies in patients of dense cataract, keeping postoperative funduscopy findings as a gold standard.

**Subjects and Methods:** This study was conducted at the Ophthalmology department, Fauji Foundation Hospital, Rawalpindi over a period of one year. 333 patients from ophthalmology outpatient department (OPD) at FFH Rawalpindi fulfilling the inclusion criteria was selected after permission from concerned authorities. All confounding variables were excluded. Informed written consent was taken. Complete Basic ophthalmological examination including; vision, IOP and slit lamp examination (anterior and posterior segment) was performed. Posterior segment in B-scan image was studied to find hidden pathologies.

**Results:** Total 333 patients were included in the study according to the inclusion criteria of the study. Mean age (years) in the study was  $62.26 \pm 10.69$  with 14 (4.2) male and 319 (95.0) female patients. There were 11 (3.3) patients who had positive B-scan in detection of posterior pathologies of dense cataract patients. The sensitivity and specificity of B-scan ultrasonography in detecting posterior segment pathologies in patients of dense cataract keeping post-operative funduscopy findings as a gold standard was 91.67% and 100% respectively.

**Conclusion:** The study concludes that the sensitivity and specificity of B-scan ultrasonography in detecting posterior segment pathologies in patients of dense cataract keeping post-operative funduscopy findings as a gold standard was high in our population. *Al-Shifa Journal of Ophthalmology 2017; 13(3): 121-26.* © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

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1. Al-Shifa Trust Eye Hospital, Rawalpindi.
  2. Fauji Foundation Hospital, Foundation Medical College, Rawalpindi.
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Al-Shifa Trust Eye Hospital  
Rawalpindi

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## Correspondence to:

Dr. Fariha Taimur  
Registrar

## Introduction:

Ocular ultrasound is in increasing demand in routine ophthalmic clinical practice because it is non-invasive and also it is an ever-advancing technology providing higher resolution imaging.<sup>(1)</sup>

The first diagnostic use of ultrasound in medicine was reported in 1953 for visualization of heart valves. Mundt and

Hughes first reported the use of ultrasound in ophthalmic diagnosis in 1956, they utilized A-scan mode. Two years later, Baum and Greenwood described B-scan ophthalmic ultrasonography. B-Scan is now widely used in Ophthalmology for evaluation of posterior segment lesions.<sup>(2)</sup> prevalence of posterior segment pathology is 19.4%.

Common pathologies like cataract, vitreous degeneration, retinal detachment, ocular trauma, choroidal melanoma, and retinoblastoma can be accurately evaluated and diagnosed with this modality. B-scan USG is cost-effective, which is an important consideration in the rural setting.<sup>(3)</sup>

Knowledge of hidden posterior segment pathologies will help the surgeon in explaining prognosis and expected outcome of surgery to patients. Surgeons can modify their plan of surgery and can also take measures to combat various predictable complications. In addition many legal and technical problems can also be avoided.<sup>(4)</sup> Ultrasonography of eyes (B-scan) is cheaper and easily available method to diagnose orbital tumors.<sup>(5)</sup> B-scan ultrasonography (B-scan) is also a well-established modality for diagnosis of anteriorly located lesions and important in diagnosing the extent of ocular trauma and aid in subsequent surgical planning.<sup>(6)</sup> According to studies, the sensitivity of b-scan ultrasonography is 96%, and specificity is 98%<sup>(7)</sup>. Another study showed sensitivity of 91.3% and specificity 100%.

The rationale of my study is that comparison of b scan and ophthalmoscopic findings is not much worked before. The results of previous work done show variability for eg. According to one study specificity of b scan is 98%<sup>(7)</sup> while other is 78%<sup>(8)</sup> which shows marked variability and needs to be verified. The purpose of my study is to explore the diagnostic

accuracy of B-scan in detecting posterior segment pathologies in dense cataract to diagnose and manage patients accordingly.

### **Subjects and Methods:**

#### **Setting:**

Ophthalmology department, Fauji Foundation Hospital, Rawalpindi.

**Sample Size:** Sample size of 333 patients was calculated by considering following parameters:

Sensitivity: 96%<sup>(7)</sup>

specificity: 98%<sup>(7)</sup>

Prevalence: 19.4 %<sup>(9)</sup>

prevalence: 19.4%<sup>(9)</sup>

Precision: 4%

Confidence interval: 95%

#### **Sampling technique:**

Non probability purposive sampling.

#### **Sample Selection:**

##### **Inclusion criteria**

- i. Patients of age group 6months- 80 years having dense cataract was included.(6 months age group is included because congenital cataract may appear as dense cataract)
- ii. Patients of both genders (male and female) were included.
- iii. Patients in which posterior segment is not visualized by direct and indirect funduscopy was studied.

##### **Exclusion criteria**

- i. Patients with known posterior segment pathologies.
- ii. Patients with open ocular trauma.
- iii. Patient with active ocular surface infection.

#### **Study Design:**

Cross sectional validation study

#### **Data Collection:**

- a) 330 patients from ophthalmology outpatient department (OPD) at FFH

Rawalpindi fulfilling the inclusion criteria were selected after permission from concerned authorities.

- b) All confounding variables were excluded.
- c) Informed written consent was taken.
- d) Observer bias was controlled by doing examination of all the cases included in the data by myself.
- e) OPD registration numbers, name, age, gender and address with contact phone number was noted.
- f) Complete Basic ophthalmological examination including; vision, IOP and slit lamp examination (anterior and posterior segment) was performed.
- g) B-scan of the eye having opaque ocular media was performed.
- h) Posterior segment in B-scan image was studied to find hidden pathologies.
- i) Cataract surgery was performed by same surgical team.
- j) Fundoscopy of all the patients were performed
- k) B scan ultrasound findings was compared with post-operative fundoscopic (direct/indirect) findings.
- l) Findings were recorded on proforma by researcher.

#### Data Analysis:

Data analysis was done with the use of SPSS version 12. Frequencies and percentages were calculated for qualitative variables like gender, b scan findings. Mean +SD was calculated for quantitative variables like age. 2x2 table was constructed to calculate sensitivity, specificity, PPV, NPV, diagnostic accuracy of B-scan, taking fundoscopy findings as gold standard. Effect modifier was controlled through stratification of age, gender to see the effect of these on outcome variables. Post stratification applying  $\chi^2$  test taken  $p=0.05$  as significant

#### Results:

Total 333 patients were included in the study according to the inclusion criteria of the study. Mean age (years) in the study was  $62.26 \pm 10.69$  with ranges from 08 months to 80 years. There were 14 (4.2%) male and 319 (95.0%) female.

There were 11 (3.3) patients who have positive B-scan in detection of posterior pathologies of dense cataract patients whereas 322 (86.7) patient have negative B-scan results for dense cataract, as shown in Table. No. 01. A 2x2 table was used to calculate the sensitivity, specificity, positive predictability value (PPV) and negative predictability value (NPV) of B-scan ultrasonography which was 91.67%, 100%, 100%, 99.69% respectively, as shown in Table no.1. Effect modifier like age (years) was stratified and compared with B-scan ultrasound findings. There were 10 (90.9) patient who were positively diagnosed for posterior pathologies having ages greater than 50 years. Chi-square test was used to compare age stratification with B-scan ultrasound findings which was statistically not significant ( $p$ -value 0.073) as shown in Table no. 2. Similarly, effect modifier like gender stratification was compared with B-scan ultrasound findings. There were 10 (90.9) female patients who were positively diagnosed posterior pathologies of dense cataract whereas only 01 (9.1) male patient was positively diagnosed posterior pathologies of dense cataract. Chi-square test was used to compare gender stratification with B-scan ultrasound findings which was statistically not significant ( $p$ -value 0.411) as shown in Table no. 3.

Table. No. 01:2 X 2 table showing B-Scan Ultrasonography in comparison Fundoscopy findings

		Fundoscopy Findings		Total
		Positive	negative	
B.Scan Ultrasound Findings	positive	11 91.7%	0 0.0%	11 3.3%
	negative	01 8.3%	321 100.0%	322 96.7%
Total		12 100.0%	321 100.0%	333 100.0%

Sensitivity: 91.67%  
 Specificity: 100 %  
 PPV: 100 %  
 NPV: 99.69 %

Table. No. 02 :Effect modifier like Age stratification and Comparison with B-Scan Ultrasound findings

		B.Scan Ultrasound Findings		P-value
		positive	negative	
Age Group	≤ 20 years	1 9.1%	4 1.2%	0.073
	21 - 50 years	0 0.0%	26 8.1%	
	> 50 years	10 90.9%	291 90.7%	
Total		11 100.0%	321 100.0%	

Table. No. 03 Effect modifier like Gender stratification and Comparison with B-Scan Ultrasound findings

		B.Scan Ultrasound Findings		P-value
		positive	negative	
Gender	male	1 9.1%	13 4.0%	

	female	10	309	0.411
		90.9%	96.0%	
Total		11	322	
Taimur et al. Role of B-Scan in evaluating eyes with opaque media		100.0%	100.0%	

### Discussion:

In our study, the mean age (years) was 62.26±10.69. Whereas in a study conducted in 2009<sup>7</sup>, the mean age in years was 65.0±45.9. In another study, frequency and percentage of male and female was 96 (40%) and 143 (60%) respectively<sup>7</sup>. However, in our study, there were 14 (4.2%) male and 319 (95.0%) female patients. Studies have reported a higher incidence of ocular trauma in males compared to females. This might have affected the results, as lesser number of ocular trauma cases were included because of more females included in the study.

B Scan is an important tool to determine the status of posterior segment in eyes with opaque ocular media. Such information is not only important to inform the patient regarding the expected visual outcome, but also helps to make an appropriate management plan. One important scenario is the presentation of a cataract patient with a history of ocular trauma. It is estimated that 500,000 blinding ocular injuries occur world-wide annually and ocular trauma is a considerable leading cause of mono-ocular blindness. Intraocular foreign bodies (IOFB) represent a subset of ocular injuries that present complex surgical challenges to remove the IOFB successfully while attempting to preserve vision and restore ocular architecture. Accurate preoperative evaluation of these eyes is important to plan surgical approaches and to determine the prognosis in these cases. For many years, diagnostic ultrasound has been used as the principle method to evaluate the posterior segment of traumatized eye with opaque media.<sup>8</sup>

A common finding in cases of senile cataract is the posterior vitreous detachment (PVD). It is the most common age-related event that occurs in the vitreous and the principal predisposing risk factor for the development of a rhegmatogenous retinal detachment. Approximately 10%–14% of patients with acute symptomatic PVD have a retinal tear on initial examination. Approximately 30%–50% of symptomatic retinal breaks with persistent vitreoretinal traction will cause a clinical retinal detachment if left untreated.<sup>7</sup>

The early detection of retinal tears is crucial to providing early treatment that might prevent retinal detachment.<sup>7</sup> No symptoms can reliably distinguish a PVD with an associated retinal break from those without. Therefore, accurate vitreous and retinal examinations are mandatory in eyes with symptomatic PVD. The recent advances in ultrasound (US) resolution have improved the acoustic detection of subtle structures in the vitreous cavity such as the posterior vitreous cortex and retinal tears, but a test validation in the setting of acute age-related PVD remains to be done<sup>9</sup>.

Lorenzo-Carrero et al found that the sensitivity of b-scan ultrasonography is 96%, and specificity is 98%. Similarly, in our study, sensitivity and specificity of B-scan ultrasonography was 91.67% and 100% respectively<sup>7</sup>.

### Conclusion:

The study concludes that the sensitivity and specificity of B-scan ultrasonography

in detecting posterior segment pathologies in patients of dense cataract keeping post-operative funduscopy findings as a gold standard was high in our population which is important in diagnosing the extent of ocular trauma and aid in subsequent surgical planning.

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## Compliance of Spectacles Wear in School Going Children in District Rawalpindi

Saman Waqar, Ishtiaq Suleri

**Background:** Compliance of spectacles use is associated with improvement in visual function. **Objectives:** To study compliance of spectacles use and determine the reasons of non-compliance among school going children in District Rawalpindi.

**Subjects and Methods:** Cross-sectional study of 441 students who had been prescribed spectacles for constant wear during school screening program done by Al-Shifa trust. After 6-8 months, a follow up visit was conducted for assessing the compliance of spectacles. Information on age, gender, school system, type of refractive error etc. was collected and analyzed to find the association of different factors with compliance of the respondents.

**Results:** The non-compliance rate in school going children of Rawalpindi district was 59%. A comparatively higher proportion of boys (20.7%) were wearing spectacles than girls (20.5%) ( $P < 0.05$ ). Compliance of spectacles was positively associated with age ( $P=0.001$ ), type of refractive error ( $P=0.008$ ), father's education ( $P=0.001$ ), mother's occupation ( $P=0.001$ ) and father's occupation ( $P=0.001$ ) (C.I=95%). The reasons of non-compliance included broken glasses (16%), forgetting at home (13%), lost glasses (9%), peer pressure (19%), do not like spectacles (28%) and poor financial conditions (15%).

**Conclusion:** The compliance rate was found to be 41%. The school screening services should include follow up visits to ensure compliance of spectacles. Counseling of parents, teachers, students and providing spectacles free of cost will be an effective initiative towards improvement of compliance. *Al-Shifa Journal of Ophthalmology 2017; 13(3): 127-32. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

*1. Al-Shifa School of Public Health, Al-Shifa Trust Eye Hospital, Rawalpindi*

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### Correspondence to:

Dr. Saman Waqar

MBBS, MPH, Fellow in PhD

Assistant Professor

Al Shifa School of Public Health

Al-Shifa Trust Eye Hospital Rawalpindi

### Introduction:

Blindness and visual impairment are one of the leading public health and socio-economic problems globally, including Pakistan. Visual impairment and its overall effect on development of children's physical and social development can be improved to a great extent with compliance of spectacles use. It was estimated worldwide that 19 million children are visually impaired. Out of these, 12 million children are affected due to uncorrected refractive errors and 1.4 million are irreversibly blind for the rest of their lives, who need visual rehabilitation for a full psychological and personal development.<sup>1</sup>

Refractive error refers to failure of the eye to focus parallel light (distant objects) on the retina. It is mainly of three types'



myopia, hypermetropia and astigmatism<sup>2</sup>. Myopia is a state of refractive error in which light rays coming from infinity are focused in front of retina, while Hypermetropia causes parallel rays of light coming from infinity to focus behind the retina with accommodation being at rest.<sup>3</sup> On the other hand, Astigmatism occurs due to irregular shape of cornea or sometimes the lens inside the eye<sup>4</sup>. Refractive error can easily corrected by spectacles and contact lens in children. Contact lenses are not routinely fitted on infants without significant unilateral impairment, such as aphakia<sup>5</sup> mostly refractive errors in children are corrected with spectacles due to their high physical activity.

Spectacles: “Spectacles is an optical appliance comprising of a frame, with sides extending towards the ears”. Frames are made up of various synthetic materials including plastic or metal while a lens comes in glass or plastic. Ideally glasses should be non-allergic, durable and adjustable.

There are several barriers towards compliance of spectacle use in children in developing countries including disapproval of spectacle wear by parents. Major reason of discontinuation of spectacles, especially in females is found to be community pressures and cosmetic appearance. Affordability of spectacle is also an important factor.<sup>6</sup> Developed countries, on the other hand face the problems associated with spectacle fit, peer pressure and response.<sup>7</sup> Misconceptions that children or young people do not need to wear spectacles is also a serious barrier<sup>8</sup>. Another school of thought is that spectacles damage or weaken the eyes, or the eyes get sunken by spectacles regular use, so they should be worn on special occasions or when absolutely needed also leads to non-compliance in large number of people.<sup>9</sup> Society beliefs regarding the appearance of a student wearing glasses is always thought of as “bookworms” “too

serious & uninteresting”, or “nerds” also stops many children of spectacles use. The study aim is to explore the reasons why children do not comply with spectacles.

### **Subjects and Methods:**

The study design was cross sectional. Study population consisted of school students who had undergone screening by team of Al-Shifa trust and were prescribed glasses from July 2014 to Dec 2014 in district Rawalpindi. The study was conducted between June 2015 to December 2015. All students between 11-16 years of ages were prescribed glasses by screening team of Al-Shifa and both males and females were included. Students more than 16 years of age, other anomalies of eyes and media opacities were excluded. Sample size calculated for this study was 384, rounded to 441 with 15% inflation rate. As it was a cross sectional study, so anticipated population was considered 1 million and hypothesized frequency of outcome variable was considered to be 50%, calculated by open Epi software, version 3 designed for sample size calculation using 95% confidence interval and 5% significance level.

$$\text{Sample size } n = \frac{[DEFF * Np (1-p)]}{[(d^2/Z^2_{1-\alpha/2} * (N-1) + p * (1-p))]}$$

District Rawalpindi was selected for the study because currently the school screening program is being carried out only in district Rawalpindi. In their first visit, Al-Shifa screening team prescribed spectacles to the students with refractive errors. A follow up visit was then conducted to assess spectacle wear compliance after 6-8 months. During follow up visit, the children who had been previously prescribed spectacles were assessed for their compliance of spectacles use and were interviewed through structured questionnaires. The list of schools was obtained from Al-Shifa centre of community ophthalmology (ACCO). Total of 8 schools were randomly selected

from list of 20 schools using lottery method.

Statistical analysis: Data was analyzed using SPSS version 18.0. Descriptive statistics (percentages, mean, SD) was used to describe the data. Chi square test was applied to check the statistical association between independent and dependent variables followed by Logistic regression analysis. Odds ratios (OR) and 95% confidence intervals were calculated.

**Results:**

A total of 441 children were included in this study. Out of the total, 210(47%) were males and 231(52%) were females Overall 41% children were found fully compliant with spectacles use. Compliance in male children was observed slightly greater (20.70%) than female children (20.50%).

The major reason of non-compliance was that, they did not like spectacles 71(28%) while 48(19%) mentioned peer pressure to be the reason for non-compliance. About 42(16%) had given the response that their spectacles were broken and they did not purchase them again. Some of them 39(15%) also responded that their parents could not afford to buy, others mentioned

Waqar et al. Compliance of spectacles wear that they forgot them at home 55(13%) and 25 (9%) had lost them.

The children who were in older age group (14-16 years) were found to be more compliant 132(30.0%) than in younger age group (11-13years) 49(11.1%). These differences were found to be statistically significant ( $\chi^2 = 78.275$ ,  $p=0.001$ ,  $df = 1$ ). Males were found to be slightly more compliant 93(20.7%) than females 91(20.5%) with a statistically significant difference of ( $\chi^2 = 20.389$ ,  $p=0.001$ ,  $df = 1$ ), [OR 0.404(95% CI=0.272, 0.602)]. Children of house wives mother were found to be more compliant 121(27.5%) than those who were working women 60(13.6%), ( $\chi^2 = 32.162$ ,  $p=0.001$ ,  $df = 1$ ). The children whose fathers were graduate 57(13%) were found to be more compliant than those whose fathers were intermediate 59(13.4%), metric 31(7.1%) or masters 14(3.2%), ( $\chi^2 = 39.073$ ,  $p=0.001$ ,  $df = 5$ ). The children who were living in joint families were 3.6 times more likely to be compliant than those who were living in nuclear families [OR 3.662(95% CI=2.455, 5.463)]. The children whose fathers were educated were 4.5 times more likely to be compliant than those whose fathers were uneducated [OR 4.529(95% CI=1.261, 16.271)].

**Table 1: Analysis between compliance of spectacles and predictors variables**

Variable		P value	Crude OR	CI (95%)
Age	11-13 years	0.001	6.251	4.100-9.532
	14-16 years		1	
Gender	Males	0.001	0.404	0.272-0.602
	Females		1	
Family type	Nuclear family	0.001	3.662	2.455-5.463
	Joint family		1	
Refractive error	Yes	0.001	2.619	1.479-4.639
	No		1	
Mothers occupation	House wife	0.001	0.322	0.217-0.479
	Working women		1	
Fathers education	Uneducated	0.02	4.529	1.261-16.271
	Educated		1	
Residence area	Rural	0.007	1.941	1.198-3.145
	Urban		1	

Academic performance improved	Yes No	0.001	10.0 1	23.79-42.16
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### Discussion:

Compliance of spectacles in this study among school going children was found to be 41% in district Rawalpindi which is greater than the compliance of spectacles in India 19 %<sup>10</sup>.

The compliance of spectacles was found to be slightly better in boys (20.7%) than girls (20.5%), reason being that girls in Pakistan are cosmetically more conscious than boys. In another study, boys were found to be more non-compliant than girls because they spend most of their time in outdoor sports/activities and the spectacles give them a studious look which they do not like<sup>7</sup>.

In this study, children in older age group (14-16 years) were found to be more compliant 132(30%) than younger age group (11-13 years) 49(11.1%). The reason was that with increasing age, the older children had greater sense of responsibility than younger ones who could not take care of their spectacles. Similar results were shown in another study where poor compliance was found in younger children. It was because of not paying attention to their parent's advice for spectacles regular use. The older children had a better understanding that they have to pay attention to their visual needs to improve their grades, which ultimately enhanced their compliance.<sup>10</sup>

In this study, more prevalent refractive error was myopia, due to the reason that after 7 years of age, the eye moves towards myopic shift. The children with myopic refractive error were found to be more compliant 77(17.5%) than those with hypermetropia 21(4.8%), astigmatism 45(10.2%) and compound eye 38(8.6%). Similar results were found in another study.<sup>10</sup>

Children of this study, residing in the urban areas were more compliant

152(34.5%) than those living in rural areas 29(6.6%), reason being better access to health care facilities. Similar results were found in an Indian study. Cosmetic issues and poor access to refractive services were reported as major reason for non-compliance in rural areas<sup>7</sup>.

Father education was found to be a very important contributing factor as the children whose father's education level was intermediate 59(13.4%), were more compliant than matric 31(7.1%), primary 15(3.4%), and uneducated 4(0.9%). Results from another study suggest that father's education has a remarkable effect on compliance of children<sup>7</sup>.

Children whose mothers were house wives were more compliant 121(27.5%) than those whose mothers were working women 60(13.6%). Children whose fathers were in business were found to be more compliant 40(9.1%) than Army 30(6.8%), banking 25(5.7%), teaching 21(4.8%), Govt. job 31(7.0%), tailoring 2(0.5%) & painter 2(0.5%). Another study also reported that poor socioeconomic status of parents was related with poor compliance of spectacles among school going children<sup>10</sup>.

Academic performance of the children who were wearing spectacles had improved as compared to those who did not wear spectacles. For confirmation of academic performance, teachers were involved in the study. Similar results were shown in a study that academic performance was found to be better in students with spectacle compliance<sup>7</sup>.

The most common reason reported by participants was that they "do not like glasses" 71(28%) because of the cosmetic reasons and the spectacles gave them the look of older people). Another study reported the same reason that children do not like spectacles because of the cosmetic reasons. 6% boys and 2% girls<sup>11</sup>.

“Peer pressure” 48(19%) was found to be another important reason for non compliance. The children shared that they were teased by their friends and family members. Another study showed similar results<sup>12</sup>. Few studies showed that parent’s disapproval was one of very important reason for non-compliance of spectacles<sup>13</sup>. Some children reported that they forgot to bring their spectacles 35(13%) on the day of visit. The children who said that they “forgot at home” were considered as non-compliant. Results of a study in china showed that more than half of students wear it on a special occasion<sup>14,15</sup>, while other studies showed that children had their spectacles in their bag due to parent’s pressure to use them, so they were carrying them but not wearing<sup>7</sup>. Some children reported that their spectacles were “broken” 41(16%) and they did not get the new one till the day of visit in our study. Evidence exists that breakage of spectacles was found to be an important contributing reason for non-compliance.<sup>13</sup>

Results showed that 24(9%) of children had lost their spectacles in school or elsewhere and they did not get the new ones till the day of visit. Some other studies reported similar results. It was observed that scratches on spectacles were also a reason of non compliance<sup>13</sup>.

Non affordability was one of the reasons of non-compliance in this study 39(15%). In contrast, other studies suggest that spectacles dispensed free of cost were less utilized than those in which recipients had to pay for them<sup>16</sup>. Some studies reported that children were not given the choice at the time of dispensing spectacles for their favorite color and style which had a negative effect on their compliance and ultimately there were increased complaints of headache and discomfort<sup>7</sup>. No such findings were found in this study.

**Strengths and limitations:**The data was directly collected from students, parents and teacher although it was very difficult to approach schools like Army Public Schools (APS) after the incidence of terrorist attack in December 2014 in APS Peshawar. As most of the screening has been done in private schools so far, so the results cannot be generalized.

### **Conclusion:**

The compliance rate was found to be 41 %. The reasons of noncompliance included broken glasses, forgetting glasses at home, glasses were lost, peer pressure, children do not like spectacles and poor financial conditions. Counseling of parents, teachers and providing students with spectacles free of cost will be an effective step towards improvement of compliance.

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## Barriers for spectacle users in choosing contact lens as an alternative vision correction method

Shamsa Sarwar<sup>1</sup>, Tayyab Afghani<sup>2</sup>, Saman Waqar<sup>3</sup>

### Abstract:

**Aims:** To find out the barriers for spectacle users in using contact lenses as an alternative vision correction method and to analyze their preferences regarding known vision correction tools.

**Study Design and methodology:** This was a cross-sectional study. To achieve the objectives of the study, a questionnaire regarding the issue was presented to the participants after taking verbal informed consent. The study population included students of Rawalpindi and Islamabad.

**Results:** The study included 350 spectacle wearers; out of which 238 were females and 112 were males with mean age of  $21.15 \pm 3.57$ . Out of the total participants 73.7% wore glasses regularly. 66.85% participants were hesitant towards spectacle use, majority of them were females. Among correction options all participants knew about glasses followed by contact lenses while comparatively less people knew about refractive surgery. Glasses were the most preferred choice among the correction options available followed by refractive surgery (21.4%) while only 16.9% preferred contact lenses as a vision correction tool.

Among the studied subjects only 23% used contact lenses simultaneously with glasses and 74.7% were satisfied with its use. The major barrier found towards contact lens use among spectacle users was fear of side effects (65.3%) and inconvenience of its use (54.6%), followed by care and maintenance (52.4%).

**Conclusions:** In spite of having the knowledge of contact lenses a very few people preferred contact lenses as a tool for vision correction. And the main barriers found were fear of side effects (eye infections) and difficult procedure of use and care, while cost was found as the weakest barrier. *Al-Shifa Journal of Ophthalmology 2017; 13(3): 133-38. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

1. *Al-Shifa Trust Eye Hospital, Rawalpindi*

2. *Al-Shifa School of Public Health, Rawalpindi*

### Correspondence to:

Shamsa Sarwar  
Bsc Hons Optometry and Orthoptics  
Al-Shifa Trust Eye Hospital Rawalpindi

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### Introduction:

The major cause of visual impairment found worldwide is uncorrected refractive

errors (43%).<sup>1, 2</sup> A total of 153 million people are estimated to be visually impaired globally from uncorrected refractive errors, of whom 8 million are blind.<sup>3</sup> The prevalence of blindness in Pakistan is 0.9%<sup>4</sup> of which 11.4% is due to uncorrected refractive errors and is recognized as public health problem.<sup>5</sup>

There are many alternatives available to maximize visual performance in simple refractive error that is spectacles, contact lenses, refractive surgery and orthokeratology. Spectacles are the most popular and easy way to correct ametropia. Contact lenses correct refractive error by substituting the front surface of cornea. There are many cosmetic, optical as well as therapeutic indications for contact lens use e.g. high refractive errors, anisometropia, keratoconus, aniridia, bullous keratopathy, coloboma etc. Orthokeratology is a clinical contact lens technique for reduction, modification, or elimination of refractive error temporarily by the application of RGP contact lenses.<sup>6, 7</sup> The possible surgical means to correct refractive error is by altering the curvature of cornea by laser application or removing the natural lens in high myopes.

Among the options discussed above, there is no single method of correction that is either appropriate or appealing to all patients. Everyone has his own preference. What you wear on your eyes make a difference in your life as well as in your personality. Satisfaction with your look makes you feel more confident. In some communities there are cultural issues regarding acceptance of spectacles, while in other communities wearing spectacles are considered attractive.<sup>8</sup>

Contact lenses dramatically improve appearance and participation in activities, leading to greater satisfaction.<sup>9</sup> Many adolescents showed interest in contact lens use but do not wear them.<sup>10</sup> Contact lenses give sharper and wider peripheral vision as

compared with spectacles and have obvious advantage in demanding physical activities. But there are innumerable myths and misconceptions regarding contact lenses among general population, which provide hindrance towards its use.

### **Subjects and Methods:**

This was a cross sectional study conducted at the colleges and universities of Islamabad and Rawalpindi from August to December 2015. The study was carried out after taking approval from hospital ethical committee, incharge of camp branch of Al-Shifa Trust Eye Hospital and informed consent from the respondents. Rawalpindi and Islamabad make the 3<sup>rd</sup> most populous metropolitan area of Pakistan<sup>11</sup>, making a population of 4.5 million.<sup>11</sup> The literacy rate of Rawalpindi and Islamabad is 80%<sup>12</sup> and 87%<sup>13</sup> respectively.

Sample size calculated for this study was 345 with the help of online software OpenEpi. The universities were selected randomly by the lottery method from the list of colleges and universities listed in Camp branch of Al-Shifa. The respondents with age ranging from 15 to 30 years and using glasses as a primary vision correction tool, were selected by convenient sampling. Any individual having ocular pathology or squint were excluded.

Data was collected with the help of self-administered questionnaire. Any queries arising were addressed there and then by the principal researcher. Statistical analysis was performed using the SPSS software ver. 17.0.

### **Results:**

A total of 350 individuals were enrolled in this study, in which 238 (68%) were females and 112 (32%) were males. The mean age of participants was  $21.15 \pm 3.57$ , ranging from 15 to 30 years. The major bulk of the study consisted of students (82.9%) while employees constituted 17.1% of the total sample. These staff

members were from different departments of the selected colleges and universities i.e. accountants, administrators, teachers, librarian, security guards etc. Individual's that were graduation students made the largest proportion of studied population i.e. 163 (46.6%), masters made 17.7%, intermediate 31.7% and others include 4% of the total sample. Out of all the respondents in this study, 258 (73.7%) wore spectacles all the times while 92 (26.3%) wore glasses occasionally: at the time of taking lectures, while traveling, watching TV etc.

Out of the total respondents studied, 234 felt hesitation with the use of spectacles of which 76.1% were females and 23.9% were males. A Chi-square test for independence indicated that females were more hesitant towards spectacle wear. Most of the respondents were hesitant in their spectacle use in functions whether those were college parties or family functions. Association between hesitation with spectacles on their face and gender is given in table 1.

**Table 1: Association between hesitation with spectacle use with gender**

Hesitation towards spectacle wear		Gender		$\chi^2=20.018$ df=1, p=0.000
		Female	Male	
	Yes	178	56	
	No	60	56	

Of all the participants using spectacles, 150 individuals were not satisfied with its use as a primary vision correction tool, of which 53.7% were females and 64.3% were males.

All (100%) participants were aware of glasses as a tool for vision correction, 73.4% of the participants had knowledge about contact lenses and 47.4% knew about refractive surgery. Most of the individuals (50%) preferred glasses as a vision correction method, 21.4% wanted to undergo refractive surgery and only 16.9% wanted to go for contact lenses. While and the other 11.7% did not want to use any type of refractive correction technique. Among all participants only 23% tried contact lenses as optional mode of refractive error correction. The mean age

of individuals in this group was  $22.25 \pm 3.12$ , and mostly comprised of females i.e. 73.4%.

Among the contact lens group 59 out of 71 (74.7%) of the participants were satisfied with its use. Among them 40.7% considered glasses more preferable among correction options, 30.5% preferred contacts and 28.8% preferred refractive surgery.

Out of all the participants who had tried contact lenses previously, 19% had discontinued its use. Among the contact lens users 84.37% were occasional users. The individuals who wore glasses as an only option to correct vision were investigated that why they had not tried contact lenses as an alternative option for



vision correction. So as to find out the hinderances towards contact lens use. Fear of side effects was observed as a major barrier, the second being the difficulty in handling it. While cost of contact lenses was found to be the least barrier towards its use. Their responses have been dispalyed in fig 1 below. Out of the respondents (54.6%) who found insertion

and removal of contact lenses difficult, only 29.72% had tried it by themselves.

A Chi-square test for independence indicated significant association between age and restriction from parent's side towards contact lens use  $\chi^2 (2, n = 350) = 6.721, p = 0.03$ , restriction from parents being more on younger participants as compared to older ones.

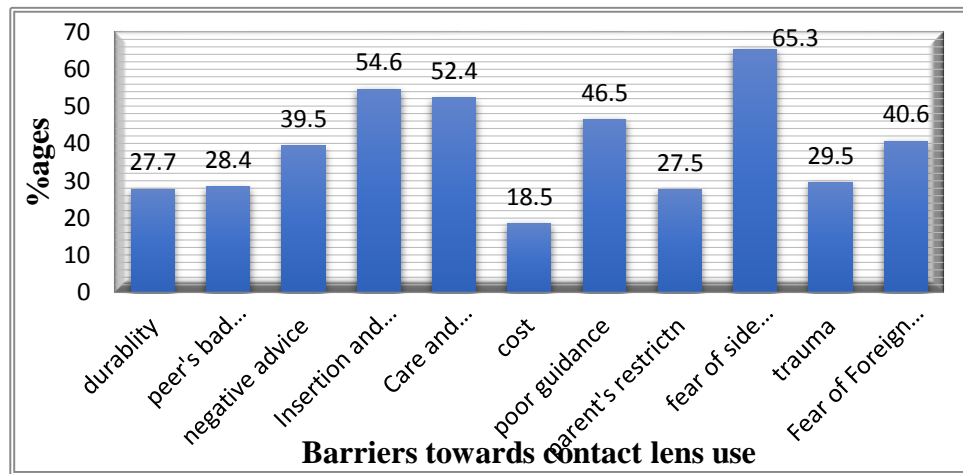


Fig 1: Bar graph showing response of spectacle wearers towards different barriers towards contact lens use.

### Discussion

This study was conducted to elicit the hurdles in the way of spectacle users because of which they do not think of contact lenses as an alternative vision correction tool. The preference of investigated participants towards refractive correction methods was also evaluated. The study population included the students of Rawalpindi and Islamabad coming in the age group of 15-30 years. To the best of our knowledge this is the only study done in this area regarding this issue.

The studied population consisted of 238 females and 112 males, and all of them were spectacle wearers. 74% of the participants wore spectacles all the times. More than half of the females (76%) felt hesitant towards spectacle

use, especially in social gatherings. Males were more confident with the use of glasses. Out of all the participants 42.85% were not satisfied with its use and wanted of get rid of it. In spite of less satisfaction with glasses still they are using it because they think no other option suitable enough to correct their refractive error.

On investigating the preference of participants regarding vision correction tools, contact lenses were found to be the least preferred choice as compared to glasses and refractive surgery, while glasses were the most preferred one. As compared to the knowledge of contact lenses, less respondents use it as a vision correction tool.

According to a study done by Riley C and Chalmers RL <sup>14</sup>, individuals were more interested in glasses followed by extended wear lenses i.e. 59% and significantly less interested in LASIK.

On comparison between the two studies it was clearly illustrated that our community do not prefer contact lenses as a useful way of vision correction.

On investigating further about the possible barriers for the spectacle users towards contact lens use, fear of side effects (eye infections) and difficult procedure of insertion and removal followed by care and maintenance inconvenience came out to be the major barriers that hinder spectacle users to commence with contact lenses, while the least people opted “cost” as a barrier towards contact lens use. The major barrier i.e. fear of side effects was exaggerated with bad experience and negative suggestion from the peers. The other barriers found were poor guidance from practitioner and fear of foreign body insertion, known as pokaphobia. According to a multi-centre survey conducted in Italy by Zeri F <sup>15</sup> et al, care of contact lenses and fear of eye infections were the weak barriers towards contact lens use among ammetropes. Another study done by Zeri F<sup>10</sup> et al concluded that among parents, main concern was taking care of contact lenses and eye damage. Thite N<sup>16</sup> et al observed lack of correct information about contact lens and cost as the major barriers from patient’s perspective. According to Berry S <sup>17</sup> et al, negative response was given for ease of its use. Gupta N and Naroo SA <sup>18</sup> also concluded the same i.e. inconvenience of use of contact lenses.

This study along with the literature shares the common point that the inconvenience of the use of contact lenses and the fear of eye infections are the major barriers that hinder spectacle

users to commence the use of contact lenses.

So, this study pointed out that among its users, insertion and removal procedure is more cumbersome along with care and maintenance procedure. Insertion and removal procedure is only mastered by oneself and is not as difficult as considered. Care and maintenance of contact lens has been made so easy with the introduction of multipurpose solutions which have wetting agents, cleaning agents, rewetting agents, and storage agents all in one bottle.

In the investigated population of our study only 23% had the experience with contact lenses and out of these 79 respondents only 15 (i.e. 19%) had discontinued its use because of some side effects or difficult procedure of handling. Tajunisah I studied that improper practice of contact lens wear and care even in educated users could increase the risk of complications.<sup>19</sup>

### **Conclusions:**

From this study it can be concluded that inspite of having the knowledge of contact lenses a very few use them as a tool for vision correction. The most preferred choice among respondents is glasses followed by refractive surgery while contact lenses come on the last. The identified barriers for spectacle users to use contact lenses are: fear of side effects, difficult procedure of its use and care, poor guidance from the eye care practitioner, fear of touching their eye, negative advice from peers, bad experience with someone around, parent’s restriction and less durability. While cost is the weakest barrier found. Among these identified barriers the main barrier found was fear of side effects because of contact lens use.

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## Effectiveness of 0.05% Cyclosporine-A Eye Drops for Allergic Conjunctivitis in Terms of Improvement in Ocular Itching Score

Muhammad Sajid<sup>1</sup>, Hussain Ahmad<sup>1</sup>, Maqsood Ahmad<sup>1</sup>, Ubaidullah<sup>1</sup>

**Objective:** To determine the efficacy of 0.05% Cyclosporine-A eye drops for allergic conjunctivitis in terms of improvement in ocular itching score.

**Subjects and Methods:** This study was conducted in the department of Ophthalmology, Khyber Teaching Hospital Peshawar from July 2015 to Jan 2016. It was a case series study. In this study a total of 259 patients were observed by using WHO software for sample size. Consecutive (non-probability) sampling technique was used for sample collection. A proforma was developed to document pre and post treatment ocular itching score. All the results were analyzed by using SPSS program.

**Results:** Our study shows that mean age was 17 years with SD  $\pm$  3.38. Fifty nine percent patients were male while 41% patients were female. Efficacy of 0.05% Cyclosporine-A eye drops was analyzed. 0.05% Cyclosporine-A was effective in 228(88%) patients and was not effective in 31(12%) patients.

**Conclusion:** Our study concludes that the efficacy 0.05% Cyclosporine-A eye drops was found to be 88% in the treatment of allergic conjunctivitis in terms of improvement in ocular itching score. *Al-Shifa Journal of Ophthalmology 2017; 13(3): 139-45. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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1. Department of Ophthalmology, Khyber Teaching Hospital, Peshawar, Khyber Pakhtunkhwa

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**Correspondence to:**

Dr. Hussain Ahmad  
Registrar, Department of Ophthalmology,  
Khyber Teaching Hospital, Peshawar, KPK  
Ph:03348805687  
E.mail:dr\_garnish@yahoo.com

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**Introduction**

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Allergic conjunctivitis is type I hypersensitivity reaction, which occurs due to degranulation of Mast cells due to the action of IgE. Acute allergic conjunctivitis is a common condition occurs as a reaction to environmental allergen like pollen. It usually affects children in spring and summer season.<sup>1</sup> Ocular allergies is one of the most common hypersensitivity disorder affecting 15-20% of population in developed countries.<sup>2</sup> Allergic conjunctivitis can be divided in to seasonal, perennial allergic conjunctivitis, vernal keratoconjunctivitis, atopic keratoconjunctivitis and giant papillary conjunctivitis.<sup>3</sup> Allergic conjunctivitis can affect both children and adult.<sup>4</sup>

Itching is a consistent and most common symptom of seasonal and perennial allergic conjunctivitis. The diagnosis of allergic conjunctivitis is usually clinical. Patients of allergic and vernal keratoconjunctivitis may cause corneal ulcers and extensive corneal vascularization that can lead to loss of vision.<sup>5,6,7</sup>

The current treatment goals for allergic conjunctivitis are to relieve symptoms, limiting the inflammatory process and protecting the cornea from any damage. First line treatment includes avoidance of the allergens, cold compressions, artificial tears, lubricants, topical antihistamines and mast cell stabilizers. Topical steroids are used in more severe cases. The use of steroids for longer period may lead to glaucoma and cataract formation particularly in children.<sup>8</sup> Because of the side effects and complications related to long term use of steroids immunomodulators like Cyclosporine have been used in ocular allergies as an alternative anti-inflammatory with fewer side effects.<sup>9</sup> Two topical immunomodulatory agents have been evaluated in multiple studies for treatment of the vision-threatening and severe VKC

and AKC: cyclosporine A (Restasis®, Allergan) and tacrolimus (Protopic®, Astellas Pharma, Tokyo, Japan). The topical ointment cyclosporine A, indicated for dry-eye syndrome, apparently modulates mast-cell activity by reducing calcium influx, degranulation, and cytokine gene expression. In a notable Japanese study of 594 patients with VKC and AKC, cyclosporine A 0.1% significantly decreased all objective and subjective scores, including itching. Cyclosporine-A (CsA) is a newer and safer steroid sparing alternative drug which is approved by the United States Food and Drug Administration.<sup>8,10,11</sup>

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The present study is designed to determine the efficacy of 0.05% Cyclosporine-A in the treatment of allergic conjunctivitis. 0.05% Cyclosporine-A is rather a novel drug and research studies are not yet conducted vastly on this drug regarding its role in allergic conjunctivitis. The results of this study will give us new insight to the local efficacy of 0.05% Cyclosporine-A for allergic conjunctivitis and will open future research recommendations in the treatment of allergic conjunctivitis.

#### Ocular Itching Score (OIS):

It is a score to assess the severity of itching of the eye. It has 4 grades. Higher grade means increased severity of itching and lower grade means a lower severity of itching.

4 means an incapacitating itch which would require significant eye rubbing.

3 means a definite itch, you would like to rub the eye.

2 means mild continuous itch (can be localized) not requiring rubbing.

1 means an intermittent tickle sensation involving more than just the inner cornea of eye.

0 means absent.<sup>12</sup>

#### Efficacy:

Efficacy was determined in terms of decrease in the ocular itching score. An improvement of ocular itching score 0-2 will be considered as effective.

## **Subjects and Methods:**

This study was conducted in the department of Ophthalmology, Khyber Teaching Hospital Peshawar from July 2015 to Jan 2016. It was a case series study. In this study a total of 259 patients were included and this sample size was calculated using WHO software with the following parameters in which the efficacy of 0.05% Cyclosporine-A was 78.6%<sup>8</sup>, Confidence level = 95%, margin of error 5%, Sample size (n) = 259. Patients were selected by consecutive (non-probability) sampling technique with the following criteria.

### **Inclusion criteria:**

- History of seasonal or perennial allergic conjunctivitis or seasonal or perennial rhino-conjunctivitis.
- Vernal keratoconjunctivitis.
- Atopic keratoconjunctivitis.
- Age 6 to 26 years and either gender.
- Symptoms of allergic conjunctivitis are experienced e.g. red, watery, itchy eyes, swollen and stinging eyes or eyelids.

### **Exclusion criteria:**

- Eye surgery in last 3 months.
- Adverse drug reaction to ocular drug.
- Use of any ocular medication or systemic medication (anti-histamine, mast cell stabilizers, non-steroidal anti-inflammatory drugs or steroids) at least 14 days prior to start of study.
- Dry eye syndrome.
- Bronchial asthma.

The study was conducted after approval from hospital ethical and research committee. All patients meeting inclusion criteria was included in the study through emergency, OPD and calls from other wards. The purpose and benefits of the study was explained to the patient and an informed consent was obtained. All the patients were worked up with detailed history and clinical examination and diagnosis were confirmed using slit lamp

examination. Treatment plan was established with the help of assessment by an Ophthalmologist (fellow of the College of Physicians and Surgeons of Pakistan (CPSP).

A pre-treatment OIS was recorded in the proforma along with other clinical and demographic information. After confirmation of diagnosis, the patients were started on 0.05% Cyclosporine-A eye drops (one drop 12 hourly) in the affected eye(s).

Patients were followed after treatment and assessed at the end of follow-up period with history, clinical examination and examination under slit lamp for improvement in symptoms and signs of allergic conjunctivitis by an Ophthalmologist. Outcome was marked as either as effective itch relief or no effective itch relief according to the clinical history and examination.

The OIS was recorded at the end of follow-up (3-months) with total score on OIS as well as outcome group as whether the patient has achieved an effective itch relief or not as described above.

The data was analyzed using the SPSS. Mean  $\pm$  standard deviation was calculated for quantitative variables like age, pretreatment ocular itching score and post treatment ocular itching score. Frequency and Percentages were calculated for categorical variables like gender and efficacy. Efficacy was stratified with age and gender to see the effect modifiers. Post stratification chi square test was applied in which P value  $\leq 0.05$  was considered as significant value. All results were presented in the form tables.

## **Results:**

In this study a total of 259 patients were observed to determine the efficacy of 0.05% Cyclosporine-A eye drops for allergic conjunctivitis in terms of improvement in ocular itching score and the result were analyzed as:

Age distribution among 259 patients was analyzed as 93(36%) patients were in age range 6-15 years while 166(64%) patients were in age range 16-26 years. Mean age was 17 years with SD  $\pm$  3.38

Gender distribution among 259 patients was analyzed as 153(59%) patients were male while 106(41%) patients were female.

Ocular itching score at pre treatment was analyzed all the patients had as ocular itching score range 3-4. While after the

treatment 228(88%) patients had ocular itching score range 0-2 and 31(12%) patients had ocular itching score range 3-4. (table no 1,2)

Efficacy of 0.05% Cyclosporine-A eye drops was analyzed 0.05% Cyclosporine-A was effective in 228(88%) patients and was not effective in 31(12%) patients. (table no 3)

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Stratification of efficacy with respect to age and gender is given in table 4,5.

**TABLE NO. 1: PRE-TREATMENT OCULAR ITCHING SCORE (n=259)**

ITCHING SCORE	FREQUENCY	PERCENTAGE
0-2	0	0%
3-4	259	100%
<b>Total</b>	<b>259</b>	<b>100%</b>

Mean itching score was 3 with SD  $\pm$  2.67

**TABLE NO. 2: POST TREATMENT OCULAR ITCHING SCORE (n=259)**

ITCHING SCORE	FREQUENCY	PERCENTAGE
0-2	228	88%
3-4	31	12%
<b>Total</b>	<b>259</b>	<b>100%</b>

Mean itching score was 1 with SD  $\pm$  1.03

**TABLE NO. 3: EFFICACY (n=259)**

EFFICACY	FREQUENCY	PERCENTAGE
Effective	228	88%
Not effective	31	12%
<b>Total</b>	<b>259</b>	<b>100%</b>

**TABLE NO. 4: STRATIFICATION OF EFFICACY W.R.T AGE DISTRIBUTION (n=259)**

EFFICACY	6-15 years	16-26 years	Total
Effective	82	146	228
Not effective	11	20	31

<b>Total</b>	<b>93</b>	<b>166</b>	<b>259</b>
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Chi square test was applied in which P value 0.9582

**TABLE NO. 5: STRATIFICATION OF EFFICACY - GENDER DISTRIBUTION (n=259)**

<b>EFFICACY</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
<b>Effective</b>	135	93	228
<b>Not effective</b>	18	13	31
<b>Total</b>	153	106	259

Chi square test was applied in which P value 0.9030

**Discussion:**

Allergic conjunctivitis is type I hypersensitivity reaction, which occurs due to degranulation of Mast cells due to the action of IgE. Acute allergic conjunctivitis is a common condition occurs as a reaction to environmental allergen like pollen. It usually affects children in spring and summer season.<sup>1</sup> Ocular allergies is one of the most common hypersensitivity disorder affecting 15-20% of population in developed countries.<sup>2</sup> In a survey it was found that 14% of children in Hong Kong between 6 to 7 years of age and 24% of 13 to 14 years old people were affected by rhinoconjunctivitis.<sup>8</sup> According to another epidemiological surveys, up to 35% of the US population suffers from ocular allergies, though the true prevalence may be higher.<sup>13</sup>

In a large meta-analysis, Wan and associates<sup>14</sup> have concluded that though CsA is effective treatment for most forms of allergic conjunctivitis, most of the reported improvements by clinicians are subjective in nature and lack objectivity from a research point of view. However, it is also stated that clinical improvement is more effectively measured by taking into consideration the improvement in subjective symptoms as reported by patients. This shows the importance of utilizing a uniform grading score for

reporting the discomfort of allergic conjunctivitis.<sup>14</sup>

Our study shows that mean age was 17 years with SD ± 3.38. Fifty nine percent patients were male while 41% patients were female. Efficacy of 0.05% Cyclosporine-A eye drops was analyzed 0.05% Cyclosporine-A was effective in 228(88%) patients and was not effective in 31(12%) patients.

In a retrospective review by Wu M and co-workers<sup>8</sup>, it was found that after 3-month treatment with topical 0.05% CsA drops, there was reduction in the itch severity score compared with baseline. Itch severity score (out of 10) at baseline was 7.9 ± 0.7 and after 3-months treatment with topical 0.05% CsA drops were 4.5±1.0 (P-value <0.0001) and 78.6% of subjects were able to be tapered off steroid eye drops.<sup>8</sup>

Similar results were found in another study conducted by Jameel A et al<sup>15</sup> in which there were 32 males and 5 females enrolled in the study. Patients had mean age of 9.8 years (ranged 5 to 18 years). There was a statistically significant improvement in the conjunctival and corneal signs after using topical cyclosporine. Bulbar conjunctival hyperemia improved in 36(97.3%) patients (p<0.01). Punctate keratitis improved in



34(91.9%) patients ( $p < 0.02$ ). Trantas' dots showed decrease in number in 31(83.8%) patients ( $p < 0.01$ ). Limbal edema improved in 33(89.2%) patients ( $p > 0.05$ ). Palpebral conjunctival papillae showed improvement in 19(51.4%) patients ( $p > 0.05$ )

Similar results were analyzed in another study conducted by Ozcan AA<sup>16</sup> in which mean age was 20 years with  $SD \pm 4.11$ . Fifty five percent patients were male while 45% patients were female. Efficacy of 0.05% Cyclosporine-A eye drops was analyzed 0.05% Cyclosporine-A was effective in 85% patients and was not effective in 15% patients.

### Conclusion:

Our study concludes that 0.05% Cyclosporine-A eye drops is more effective in the treatment of allergic conjunctivitis in terms of improvement in ocular itching score.

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ORIGINAL ARTICLE

## Post-operative Complications After Reconstruction of Contracted Socket Using Amniotic Membrane

Tehmina Nazir<sup>1</sup>, Fariha Taimur<sup>1</sup>

### ABSTRACT

**Introduction:** This study aimed to report the rate of post-operative complications after reconstruction of contracted socket using amniotic membrane.

**Objective:** To see the rate of post-operative complications after reconstruction of contracted socket using amniotic membrane.

**Study Design:** Quasi-experimental

**Setting:** The study was conducted at Al-Shifa trust Eye Hospital Rawalpindi.

**Subjects and Methods:** Patients presenting to the clinic with acquired contracted sockets were included in this study. Amniotic membrane used in study was prepared at Al-Shifa Trust Eye Hospital from placentas. Reconstructive surgery and amniotic membrane transplantation was performed by same surgeon under GA. Patient was followed up in outpatient department for 3 months to observe the post-operative complications.

**Conclusion:** Amniotic membrane grafting is a simple and straight forward surgical technique for the treatment of contracted socket and it gives cosmetically and functionally acceptable results with minimal post-operative complications in reconstruction of anophthalmic contracted socket. *Al-Shifa Journal of Ophthalmology* 2017; 13(3): 145-52. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

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1. Al-Shifa Trust Eye Hospital, Rawalpindi.

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2. Fauji Foundation Hospital, Foundation Medical College, Rawalpindi.

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**Correspondence to:**

Dr. Tehmina Nazir  
Assistant Professor  
Foundation Medical University  
Fauji Foundation Hospital  
Rawalpindi

**Introduction:**

The orbit is the eye socket, which is formed by cheekbone, the forehead, the temple, and the side of the nose. The eye is cushioned within the orbit by pads of fat. Socket is the space posterior to the eyelids and anterior to the muscle cone that is created following enucleation or evisceration of an eye<sup>1</sup>. Enucleation and evisceration surgery involve permanent removal of the patient's eye<sup>2</sup>. These are indeed mutilating<sup>3</sup> and painful procedures but are lifesaving.<sup>4</sup>

Evisceration, enucleation, and exenteration are three main surgical techniques by which all or part of the orbital contents is removed. Evisceration is the removal of the contents of globe while leaving the sclera and extraocular muscles intact. Enucleation is the removal of the eye from the orbit while preserving orbital structures. Evisceration is usually indicated in cases of endophthalmitis unresponsive to antibiotics and for improvement of cosmesis in a blind eye, painful eye with no useful vision, malignant intraocular tumors, ocular trauma to avoid sympathetic ophthalmia in the second eye, in phthisis with degeneration, and in congenital anophthalmia or severe microphthalmia to enhance development of the bony orbit.

The loss of an eye is often followed by scar tissue contracture. Spontaneous healing of wounds of adult conjunctiva consists of inflammation followed by re-epithelization, wound contraction and the formation of sub-conjunctival fibrous scar. Many materials are available for reconstruction of socket out of which AM is gaining popularity but in spite of this fact it is related to a number of post-operative complications.

The aim of this study was to report the rate of post-operative complications after reconstruction of contracted socket using amniotic membrane.

**Subjects and Methods:**

The Quasi- experimental study was conducted at Al-Shifa Trust Eye Hospital, Rawalpindi over a period of 8 months. In total 30 patients presenting with acquired anophthalmic contracted socket were included in study. Sample was collected by non- probability convenience sampling.

**INCLUSION CRITERIA:**

1. Patients with acquired contracted socket following evisceration or enucleation.
2. Patients of all the ages were included
3. Patients of either gender

**EXCLUSION CRITERIA:**

1. Patients of congenital anophthalmia
2. Patients with infected sockets

**DATA COLLECTING PROCEDURE:**

1. Patients coming to the oculoplastic clinic with acquired anophthalmic contracted sockets who fulfilled inclusion criteria were included in this study. Informed consent was taken from each patient about surgery. History was taken, proper examination and relevant investigations were done. Pre-operative measurements of the contracted socket were taken.

2. Amniotic membrane used in this study was prepared at Al-Shifa amniotic membrane bank. Placentas were brought from Fauji foundation Hospital and Rawalpindi General Hospital. The consent of the donor was obtained for the donation (and subsequent use of AM). Donors were screened for human immunodeficiency virus(HIV) type 1 and 2, hepatitis B virus(HBV), hepatitis C virus (HCV) and trepenoma pallidum infections. The AM was obtained under sterile conditions after elective caesarian section.
3. In the laboratory, under the laminar flow hood, the AM was washed. With the epithelial / basement layer surface up, the AM was spread uniformly without folds or tears on individually sterilized 4.5cm<sup>2</sup> nitrocellulose filter paper. The filter membrane along with adherent AM was placed carefully in the preservative medium . the bottles were labeled with appropriate size and date of preparation. The AM was stored at -80<sup>0</sup> C to facilitate the devitalization of the epithelial cells.
4. Reconstructive surgery and amniotic membrane transplantaion performed by same surgeon under GA.
5. After dissection and proper application of AM in the contracted socket, conformer was placed in socket and a temporary tarsorrhaphy was done in some cases.
6. Patients were examined on next post op day and were discharged

on topical steroids, topical and oral antibiotics. They visited the clinic after 1 week and then monthly for 3 months to observe the patient for post-operative complications

### **Results:**

30 patients full filling the inclusion criteria were included in this study, amongst the total study participation 12 (40%) were males whereas 18(60%) were females. The mean age of study participants was 23.77 years(SD +/- 14.30) with the youngest patient of age 4 years and eldest was 56 years of age. The mean age of females was 22.33 year (SD +/- 14.30) and male was 25.92years(SD+/- 19.66 years).

15(50%) were operated on the right eye and equal number and percentage of patients were operated for the left eye.

The causes of anophthalmia in the patient are given in the table 1.

Gender wise distribution of causes of anophthalmia is shown in a graph in fig. 1. The mean duration of anophthalmia was 15 months (SD+/- 11.15 months) the minimum duration being 4 months and maximum of 60 months.

State of graft as regarding dehiscence, none of the patients out of 30 had it on first post op day. Shrinkage was not found in any patient till 1 week but was then observed in 6 patients till last follow up visit. Results are shown in table 2 and table 3.

Infections like suture infiltrate and purulent discharge was recorded as shown in table 4 and table 5. Colour of the graft in 76.6% of patient was pink and 23.3% of the patients had pale graft on the last visit.

**Table No. 1: Causes of anophthalmia**

<b>Causes of anophthalmia</b>	<b>Frequency</b>	<b>%ages</b>
Perforating injury	12	40

Chemical injury	5	16.7
Panophthalmitis	6	20
Endophthalmitis	3	10
Retinoblastoma	3	10
Buphthalmos	1	3.3

**TABLE 2: Dehiscence of membrane**

	No. of pts. With dehiscence	%age
<b>1<sup>st</sup> post op day</b>	0	0
1 <sup>st</sup> post op week	4	13.3
<b>1<sup>st</sup> post op month</b>	4	13.3
<b>2<sup>nd</sup> post op month</b>	4	13.3
<b>3<sup>rd</sup> post op month</b>	4	13.3

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**Table 3: Shrinkage**

	No. of pts. with shrinkage	% ages
<b>1<sup>st</sup> post op day</b>	<b>0</b>	<b>0</b>
<b>1<sup>st</sup> post op week</b>	<b>0</b>	<b>0</b>
<b>1<sup>st</sup> post op month</b>	<b>6</b>	<b>20</b>
<b>2<sup>nd</sup> post op month</b>	<b>6</b>	<b>20</b>
<b>3<sup>rd</sup> post op month</b>	<b>6</b>	<b>20</b>

**Table 4: Suture infiltrates**

	Frequency	% ages
<b>1<sup>st</sup> post op day</b>	<b>3</b>	<b>10</b>
<b>1<sup>st</sup> post op week</b>	<b>6</b>	<b>20</b>

<b>1<sup>st</sup> post op month</b>	<b>4</b>	<b>13.3</b>
<b>2<sup>nd</sup> post op month</b>	<b>0</b>	<b>0</b>
<b>3<sup>rd</sup> post op month</b>	<b>0</b>	<b>0</b>

**Table 5: Purulent discharge**

	<b>Frequency</b>	<b>%ages</b>
<b>1<sup>st</sup> post op day</b>	<b>1</b>	<b>3.3</b>
<b>1<sup>st</sup> post op week</b>	<b>5</b>	<b>16.7</b>
<b>1<sup>st</sup> post op month</b>	<b>7</b>	<b>23.3</b>
<b>2<sup>nd</sup> post op month</b>	<b>3</b>	<b>10</b>
<b>3<sup>rd</sup> post op month</b>	<b>1</b>	<b>3.3</b>

**figure 1**

**Graphical representation of %ages of causes of anophthalmia**

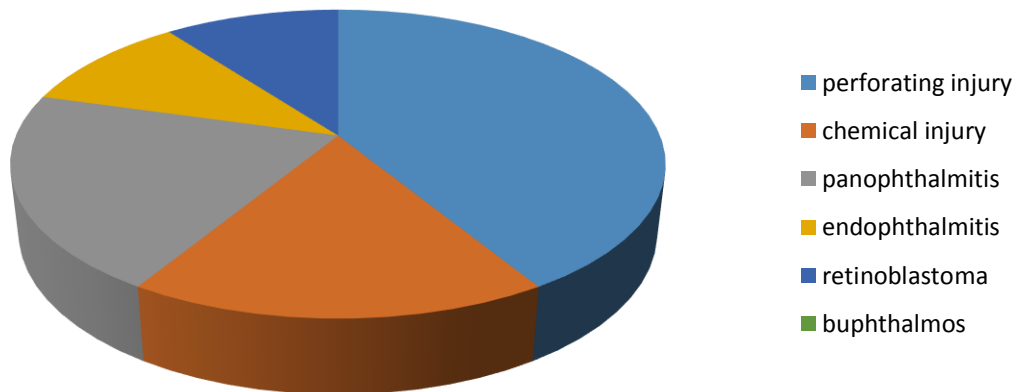
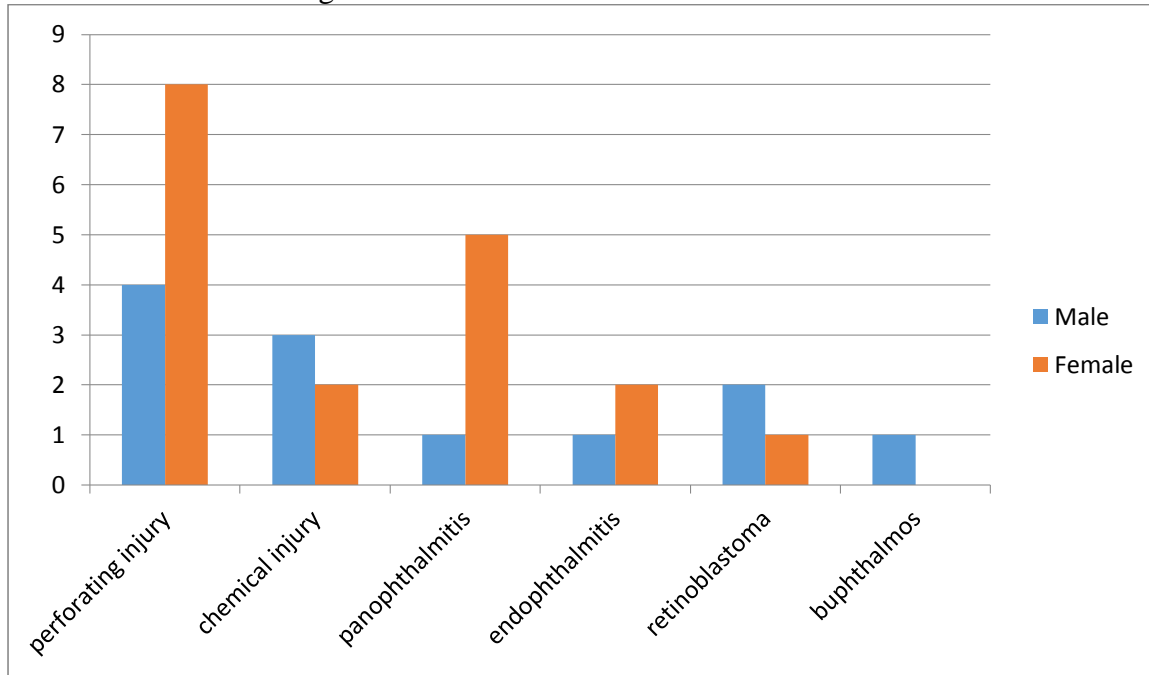


Figure 2



Graphical representative showing causes of anophthalmia according to gender September 2017

### Discussion:

Evisceration and enucleation are agonizing surgeries but these are lifesaving procedures<sup>4</sup>. These are the situations which ophthalmologist frequently come across and are always depressing for the patient as well as for the surgeons. While doing this study it was seen that patients were psychologically very disturbed because of anophthalmia and inability to wear prosthesis properly, but once they started wearing an artificial eye after reconstruction of socket with AMT, their confidence and self-esteem was much improved.

AMT is gaining popularity for ocular use but there are very few studies published regarding use of AM for socket reconstruction. Some studies report that amniotic membrane grafting gave cosmetically and functionally acceptable results, comparable to those of mucous membrane grafting, with a low rate of complications, and without discomfort of donor sites in cases of mild to moderate

grades of contracted sockets<sup>5</sup>. Amniotic membrane is known to promote conjunctival epithelial cell migration over the graft, and to inhibit inflammation and fibrosis<sup>6,7</sup> In our research work by taking history from patients, causes of acquired anophthalmia were found out and it was seen that most common causes in this study were perforating injury(40% of cases) and panophthalmitis (20%) and least common was buphthalmos(3.3%). In a study done by Khan and colleagues<sup>4</sup>,almost similar results were demonstrated who showed that trauma and post-operative panophthalmitis were the commonest causes for evisceration. Our results do not agree with work done by Krishna G<sup>8</sup> who demonstrated that the extent of contraction of socket was found in descending order in cases of chemical injuries, panophthalmitis, perforating injuries, endophthalmitis, retinoblastoma and least in microphthalmos.

Mean duration of anophthalmia in our study was 15 months. The interval

between the loss of the eye and the time when the patient first reported for treatment was immaterial as after a certain period, contraction becomes stationary. No direct relationship between the amount of contraction and its duration could be established.

There is no direct relationship between the age and the amount of contraction of the socket. In our study there were 8 male and 12 female patients, with an age range between 4 years and 56 years.

80% of our patients, who underwent socket reconstruction, were able to retain and support a cosmetically acceptable ocular prosthesis and maintain a deep and stable fornix during the period of follow up. This is comparable to work done by Poonyathang A<sup>9</sup> who investigated the use of amniotic membrane graft for socket reconstruction. In their study same percentage of patients that is 80% were able to wear artificial eye post-operatively. Their patients were followed up for a mean period of 13.6 months. Mean follow period of our study was 3 months and this is a limitation of our study to see the long-term effects of amniotic membrane used in socket reconstruction, and definitely these patients need long term follow up for assessment.

We experience few complications with AM. In the present study infection in the operated eye was seen initially but that was controlled by the use of topical as well as oral antibiotics and steroids. Three patients had suture infiltrates on 1<sup>st</sup> post-operative day, six had on 1<sup>st</sup> post-operative week and four patients presented with this problem after 1<sup>st</sup> post-operative month but all of them were completely relieved before the end of study period. Similarly, purulent discharge was present initially but on 3<sup>rd</sup> month it was reported in only one patient.

Graft dehiscence and shrinkage are usually present simultaneously. In our study whenever there was shrinkage or

dehiscence found, adhesions between different parts of the membrane was also seen this is because amniotic membrane has tendency to form adhesion with itself. In this study it was found that no case presented with shrinkage till 1<sup>st</sup> post-operative week and this can be explained by the fact that because conformers gives support to the membrane these complications were seen when conformer was removed. Four patients out of thirty had complete failure of AMT because of graft dehiscence. All 4 had shrinkage with dehiscence, including them total six patients presented with shrinkage till last visit. These patients were booked for repeat AMT. These observations do not agree with the findings presented by Poonyathalang A<sup>9</sup> where no serious complications like infection or graft rejection were reported.

On 1<sup>st</sup> post op week 80% of the patients had pink coloured graft and 20% had pale graft. Almost same findings were present on final visit that is 76.6% patients with pink graft and 23.3 % with pale graft. Pale graft was mostly seen in the patients with graft shrinkage and dehiscence. Amniotic membrane is originally transparent but pink colour is indication of graft failure because it becomes relatively opaque.

It was seen during this study that frozen AM is good for ocular use. Several workers have used fresh membranes for clinical use<sup>10</sup> and there may be some theoretical advantages of fresh membranes over preserved membranes but the risk of HIV infection despite seronegativity, due to window period between infection and sero-conversions is real.

Good aspect of our study by using AM was that problems associated with other graft materials, including poor access to the donor area, risk of perforation of the donor area and limited available graft were totally eliminated. AM is an autogenous tissue that is easily harvested. The donor graft site does not need any separate



procedure for reconstruction. The amount of tissue available from the from the AM graft site is not limited. AM being prepared in our own hospital was freely available even for repeating the procedure.

### **Conclusion:**

Amniotic membrane grafting gave cosmetically and functionally acceptable results in cases of anophthalmic socket contraction. Its use can be a valuable alternative in socket reconstruction with a high success rate, a low rate of complications, and without discomfort of donor sites.

Amniotic membrane as a graft on the palpebral surface is very useful since it possesses both a thick basement membrane and an avascular stromal matrix. AM undergoes nominal postoperative shrinkage. Its inherent quality of good substrate helps to provide support that prevents sagging of the lower lid so providing better cosmesis and prosthetic motility. Patients were satisfied subjectively with cosmetic results.

The study also pointed out that problems like donor area reconstruction, infection and insufficient availability of donor tissue are eliminated by the use of amniotic membrane and it can be considered as an alternative to other graft materials like mucous membrane in promoting epithelial healing and preserving cosmetic appearance in patients with contracted socket. So amniotic membrane is a simple and straightforward surgical technique which should form part of the therapeutic arsenal for the treatment of contracted socket. It is definitely preferable to other formerly used tissue and has proven useful in the reconstruction because of its easy availability.

In spite of all these good points about amniotic membrane seen in this study it is recommended that large patient population, randomized controlled trials and additional studies comparing AMT with routine medical therapies and other surgical techniques with long term follow

up are needed to launch the safety and effectiveness of AMT in ocular conditions.

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CASE REPORT

## Congenital cystic eye ball with an intracranial anomaly: A Case Report

Maheen Akbar<sup>1</sup>, Amna Manzoor<sup>1</sup>, Sunday Okonkwo<sup>1</sup>

### Abstract

A three months old female child presented to Al-Shifa Trust Eye Hospital, Rawalpindi, with abnormal protrusion from the left orbit since birth which increased gradually in size. The mass was cystic in consistency, non-tender, non-pulsatile and transilluminated light. No eyeball could be identified. MRI brain and orbit revealed a cystic orbital mass with complete agenesis of corpus callosum, with no other associated brain anomaly. Her systemic evaluation was unremarkable at three months. No positive family history was found. Routine haematological and biochemical tests were normal. Cystic eye ball is a very rare entity and its association with complete agenesis of corpus callosum even rarer. It brings home a very important message of grave systemic associations of a cystic eye ball making MRI brain and orbit mandatory in all cases with this congenital condition. This can easily be overlooked by an ophthalmologist and systemic review missed. Another important consideration is a regular follow up in such cases with a pediatric neurologist keeping in view the agenesis of corpus callosum and the evolution of its symptoms. *Al-Shifa Journal of Ophthalmology 2017; 13(3): 153-57. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

## **Introduction:**

Congenital cystic eye, a term coined by Ida Mann in 1939<sup>1</sup> is a rare ocular malformation in which the eye fails to develop correctly in utero and is replaced by benign, fluid-filled tissue. Embryologically, the defect is thought to result from non-invasion of the primary optic nerve vesicle between the 2 mm and 7 mm stages of the embryonic development, and ectodermal elements do not develop into the future eye structures<sup>2,3</sup>.

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*1. Al-Shifa Trust Eye Hospital,  
Rawalpindi*

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## **Correspondence to:**

Dr. Maheen Akbar

Registrar

Department of Orbit and Oculoplastics

Al-Shifa Trust Eye Hospital, Rawalpindi.

The orbit thus contains a cyst instead of an eye. The cyst is usually completely filled by proliferating glial tissue. In contrast, a discontinuation in development between the 7 mm and 14 mm stage of embryonic development leads to formation of the more common coloboma<sup>2</sup>. The disorder is unilateral but bilateral congenital cystic eye has been reported previously<sup>4</sup>. Concomitant non-ocular malformations including intracranial anomalies and systemic malformations are often found in association<sup>5</sup>.

The incidence of congenital cystic eye is not known. By 2014 about 40 cases have been reported in English literature<sup>5,6</sup>. To our knowledge only one case of congenital cystic eye which was associated with accessory limb of the lower eyelid has been reported previously on a child born of Pakistani parents by Rice et al<sup>7</sup> in 1966. Herein we report a case of congenital

cystic eye on another Pakistani child but with agenesis of the corpus callosum.

The corpus callosum is a part of the brain that connects the two sides (cerebral hemispheres) of the brain. Agenesis of the corpus callosum (ACC) is a birth defect that happens when this structure does not develop properly. There is a broad range of outcomes for babies born with agenesis of the corpus callosum, ranging from essentially normal function in the mildest cases to a range of potential health and developmental problems as severity increases.

Ocular associations with ACC have been studied by a few authors while the association of cystic eye ball with ACC is still very rare and infrequently reported. Hence we are reporting one more case.

## **Case Report**

A three months old female child presented to Al-Shifa Trust Eye Hospital, Rawalpindi with abnormal protrusion from the left orbit since birth which increased gradually in size. There was no observed change in its size while crying and there has not been any recorded incidence of seizures.

She is the third child of her parents married non-consanguineously. The other siblings are alive and well. There was no history suggestive of developmental malformation of the eye in the family. She was delivered normally and the pregnancy, labour and delivery were uneventful. Her developmental milestones are appropriate for age.

Examination revealed protruding mass from left orbit stretching the upper eyelid forward (Fig 1). The mass was cystic in consistency, non-tender, non-pulsatile and transilluminated light. The eyelids were separated by thickened and hyperemic conjunctiva. No eyeball was identified. There was mild lower eyelid coloboma

infrequently reported. Hence, we are reporting one more case involving the lateral third of the lower eyelid concealed by the mass. The right eye was normal. Systemic evaluation was unremarkable. Routine haematological and biochemical tests as well as chest X-ray were normal. An MRI brain and orbit done on her revealed a cystic left orbital mass with associated complete agenesis of the corpus callosum (Figure 2).

The patient underwent surgery. An anterior orbitotomy approach was used to excise the cyst and orbital implant placed. Needle decompression of the mass during surgery revealed dark brown coloured feathery particles suspended in clear fluid. Some rudiments of the extra ocular muscles were found. There was no optic stalk for the cyst.



Akbar et al. Congenital Cystic Eye Ball with intracranial anomaly

Figure 1. Preoperative photograph showing cystic left eye

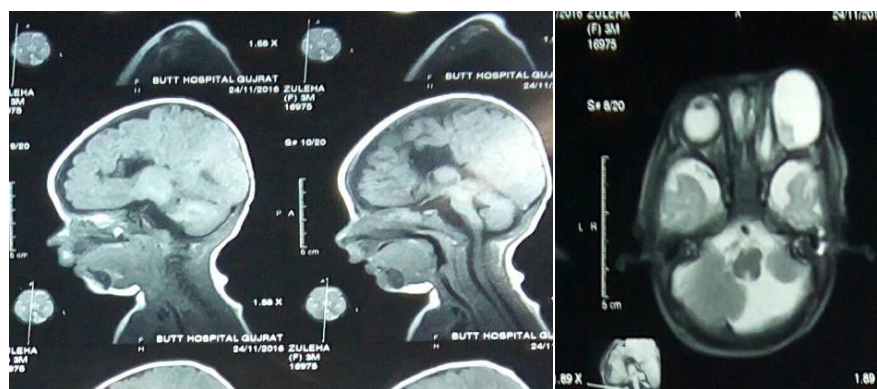


Figure 2: MRI of the patient showing complete agenesis of the corpus callosum and cystic left eye ball.

### Discussion

The aetiological factor(s) responsible for the failure of invagination of the primary optic vesicle at the 2 to 7 mm stage of embryonic development with the resultant cystic eye formation is unknown<sup>2</sup>. The frequent presence of inflammatory cells in the cyst suggests an inflammatory cause<sup>8</sup>. It is considered to be non-hereditary as none of the cases reported so far has been shown to be due to heredity just as in our

patient. A few genetic investigations performed in some cases yielded no peculiar defects<sup>6</sup>. No abnormalities during pregnancy or perinatal period have been described<sup>9</sup>.

It usually presents as a cystic swelling that stretches the upper eyelid as in our case and can be differentiated from colobomatous cyst (microphthalmia with cyst) which is associated with a small but

recognizable eye and it usually enlarges inferiorly, displacing the lower eyelid rather than the upper eyelid<sup>10</sup>.

Most reported cases of congenital cystic eye are evident at birth as in our patient. However, in some cases the cystic character of the lesion may not be evident at birth. Hayashi et al,<sup>11</sup> reported cystic orbital swelling being observed in their patient three months after birth. The size of the cyst is variable and there is no relationship between the size and the age<sup>11</sup>. The size of the cyst is believed to be related to the patency of the optic stalk<sup>9,11</sup>. If the stalk is patent, the size of the cyst remains small due to communication of the cyst with the cranial cavity as described by Hevelston et al in a case report<sup>12</sup>. No stalk was identified in the present case.

Congenital cystic eye can occur in isolation or with other ocular or non-ocular malformations<sup>11</sup>. Ocular malformations reported to occur include eyelid abnormalities such as accessory limb, skin tags, notch, coloboma<sup>2,7,11</sup>. In our case she had a mild coloboma involving the lateral third of the lower eyelid.

The contralateral eye in most cases is normal, although a case of high myopia, a case of microphthalmos with cyst, and a case of non-persistent hyperplastic primary vitreous of the contralateral eye have been reported<sup>9</sup>.

Non-ocular abnormalities include facial clefting, saddle nose, malformation of nostril, choanal atresia, malformed sphenoid bone, multiple punched-out lesions of the scalp and face, agenesis of the corpus callosum, basal cephalocele, electroencephalographic abnormal signs in the region of Rolandic area, midbrain deformity, microphthalmos with hydrocele, hypoconvex fingernails on short stubby fingers and bifid thumb<sup>3,5,9,11</sup>. Our patient has complete agenesis of the corpus callosum. The aetiological basis of

association of intracranial anomalies with congenital cystic eye is not clear due to the paucity of reported cases<sup>13</sup>. The term cranial ectodermopathy has been used by some authors for this constellation of anomalies, and some have suggested an association of prosencephalic defects with that of the optic vesicle. However, these abnormalities do not provide further insight into the pathological findings<sup>14</sup>.

There is no standardized protocol for management of the congenital cystic eye<sup>6</sup>. Conservative treatment includes observation with aspiration as needed<sup>5</sup>. Surgical intervention is strongly advised to obtain an optimal cosmesis. Regarding timing of surgery, cystic globes have been excised within a week to several years after the birth<sup>6</sup>. In most instances the cyst is surgically removed shortly after diagnosis<sup>10</sup>. However, it might be necessary to delay removal of an orbital cyst so as to encourage growth of the orbit. McLean et al<sup>15</sup> reported overall good cosmetic outcome in 33 out of 34 patients with orbital cysts following treatment regimen that involved delay of surgery in select cases. In their report, grossly enlarged cysts (with proptosis through the palpebral fissure) were excised soon after presentation and replaced with an orbital implant and ocular prosthesis while Large cysts (with no proptosis from the palpebral fissure) were left to encourage orbital growth only to be removed between the ages of 3–5 years when orbital growth was near completion. Our patient had surgical excision at 3 months due to enlarging lesion and cosmetic concerns.

Though cystic eye ball is not to be confused with microphthalmos with a cyst, but it also has an association with absence of corpus callosum<sup>16</sup>. Many congenital diseases of the eye have various systemic associations. One reported case of microphthalmos with a cyst and a missing thumb<sup>17</sup> found Fanconi anemia to be an association, marking the importance of

workup of Fanconi anemia is suspected cases in congenital eye ball conditions. This is the only reported case so far and it had serious implications. Our case has association of congenital cystic eye ball with absence of corpus callosum. Corpus callosum is integral for functional connectivity especially in cognitive domain. Though the infants might not show symptoms right away especially if there are no associated intracranial abnormalities but later on seizures, cognitive impairment, poor feeding and swallowing, poor muscle tone and coordination and psychological difficulties may be experienced, emphasizing the need of a long term follow up with a pediatric neurologist. Our patient so far is neurologically stable, but the need of regular follow up visits has been stressed upon.

Another case reported a congenital cystic eye ball with a low grade cerebellar lesion that spontaneously regressed<sup>18</sup>. The patient presented with a cystic eye ball and on doing MRI brain this cerebellar lesion was revealed which then regressed spontaneously.

This and other reported cases clearly emphasize on the need of a proper systemic evaluation that might easily be missed by an ophthalmologist while dealing with cases presenting with a congenital cystic orbital lesion, which may have serious implications. The cyst is removed surgically but the case should not be wrapped up on this. An MRI brain is a MUST along with relevant systemic investigations should be carried out and a timely pediatric and pediatric neurologist opinion sought. Time is of utmost importance. Early recognition and treatment is the goal. Chromosomal analysis might be of help but the early insight is important.

### **Conclusion**

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Congenital cystic eye ball is very rare and its association with complete agenesis of corpus callosum even more rare, justifying the need of a early MRI brain and orbit in all cases of congenital cystic eye ball conditions. Serious systemic implications in this case and few others already reported, emphasize the need of a proper systemic evaluation for diagnosis, early recognition of problems and their management as this can easily be missed by an ophthalmologist. Regular follow ups with a pediatric neurologist in this case are also very important.

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