

## A Prospective Study on B Scan Findings in Advanced Cataract Cases During COVID-19 Pandemic: A Hospital Based in North Karnataka Region

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### Abstract:

**Purpose:** To determine posterior segment pathologies using B scan in advanced cataracts of patients with limited access to healthcare during COVID-19 lockdown.

**Type of study:** Hospital based descriptive cross-sectional study over 1-2 years duration.

**Material and Method:** This study is done at the Dept. of Ophthalmology in KBN University from Dec 2021 to Aug 2023. 50 eyes of patients with advanced cataracts visiting OPD with complaints of progressive diminution of vision when lockdown was relaxed. After taking detailed history, inclusion and exclusion criteria, patients were included in the study. All patients underwent comprehensive ocular evaluation. B-Scan USG (12 MHz) was performed and data was assessed regarding posterior segment pathologies found.

**Results:** Incidence of posterior segment pathology was 16% with male preponderance. Out of 50 patients, 12 patients recovered from COVID-19 infection- out of which 1 had Diabetes Mellitus and on B scan no posterior segment pathology was found and 38 patients were tested negative for COVID-19. Diabetes was most common systemic disease (32%). 10% of patients had intra ocular pressure over 21 mm of Hg. Retinal detachment was seen in 1 patient and vitreous hemorrhage with retinal detachment was seen in 1 patient of blunt trauma. CT scan orbit in showed no IOFB. Retinal detachment, PVD and Asteroid hyalosis were most common accounting for 4% followed by Posterior staphyloma (2%) and Vitreous hemorrhage (2%).

**Conclusion:** B-scan is extremely efficient and necessary tool in diagnosing various ocular abnormalities and influences surgical planning and postoperative visual outcome. Lockdowns imposed in India due to COVID-19 further increased the incidence of advanced cataracts highlighting importance of performing B scan in such eyes. Knowledge about posterior segment pathologies invisible on funduscopy is of immense help to surgeons in planning, executing and explaining prognosis to patients.

**Keywords:** B scan, COVID-19, Cataract.

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### Introduction

Ultrasonography is a valuable tool for evaluating posterior segment in eyes with advanced cataracts. B-scan provides cross sectional display of diseased tissues [3]. It is an efficient, non-invasive, reliable and inexpensive diagnostic technique for evaluation of Orbital pathology. Ultrasound is an acoustic wave that consists of an oscillation of particles within a medium.[4] The frequency used in diagnostic ophthalmic ultrasound for posterior segment is anywhere between 8–12 Mhz. Studies on

ultrasonographic evaluation in eyes with opaquemia have shown incidence rates of posterior segment pathology to vary from 19.6% to 66%.[1,2] During covid 19 lockdown as many people were unable to avail medical help and due to late reporting of the people to hospital with advanced cataracts, the need of B scan machine for detailed evaluation of posterior segment of the eye is inevitable.

## Materials and Methods

This study is done at the Dept. of Ophthalmology in KBN University from Dec 2021 to Aug 2023. All patients satisfying the inclusion and exclusion criteria were included in the study. After obtaining informed consent, detailed ophthalmic and medical history was taken. Visual acuity was tested using Snellen's chart, ocular examination was done using slit lamp, IOP measured using applanation tonometry, indirect ophthalmoscopy, ocular biometry, sac syringing and B-scan ultrasonography was performed. Patients were evaluated using standard high resolution USG machines equipped with a real-time high-frequency probe (8-10Hz) with contact method.

This study was done to know incidence of people presenting with advanced cataracts and associated posterior segment pathologies detected on B scan during COVID-19 lockdown.

### Inclusion Criteria

- All patients with mature and hypermature cataract with non visualisation of the fundus on indirect ophthalmoscopy
- Presence of recent penetrating or blunt ocular injury

### Exclusion Criteria

- Subjects younger than 18 years of age
- Prior eye surgery

### Procedure of B Scan

The patient is made to sit in front of computer screen with B scanning program installed in it. The patient is asked to close eyes and gel is placed ultrasound probe. Probe is kept over patients closed eye. Patient is instructed to move his eyes; axial and transverse scans are taken by changing the position of the probe. On changing gain, vitreous and retinal pathologies are distinguished.

### Results

#### Demographic data

Out of 50 eyes with advanced cataracts 8 eyes had posterior segment pathology with incidence of 16%. Mean age of patients was 58.6 +/-12.2 years. Male patients outnumbered females . 56% of patients were males and 44% were females [table 1]. No patients had bilateral dense cataracts, Mean IOP was found to be 19 +/- 5.6 mmHg. 12 patients had recovered from COVID-19 infection, and 38 patients were tested negative for COVID-19.

**Table 1: Demographic data**

<b>Males</b>	<b>28</b>	<b>56%</b>
<b>Females</b>	<b>22</b>	<b>44%</b>

**Table 2: Patient systemic and ocular features associated with possible presence of posterior segment pathology on ultrasonography**

<b>Ocular Features</b>	<b>No of Patients</b>	<b>Percentage</b>
Diabetes	16	32%
Younger Age	4	8%
Raised Iop	5	10%
Keratic Precipitates	2	4%

Diabetes was most common systemic disease (32%). 8% of the patients were less than 40 years of age. 10% of the patients were found to have raised intra ocular pressure over 21 mm of Hg. On examination of the anterior segment 4% of the patients had keratic precipitates .

Out of the 12 covid 19 recovered patients only 1 patient was found to have Diabetes Mellitus . The rest of covid 19 recovered patients had none of the above-mentioned ocular and systemic features.

**Table 3: posterior segment pathologies and frequencies**

<b>Posterior segment pathology</b>	<b>No of people</b>	<b>Percentage</b>
Retinal detachment	2	4%
PVD	2	4%
Asteroid hyalosis	2	4%
Posterior staphyloma	1	2%
Vitreous haemorrhage	1	2%

Retinal detachment, PVD and Asteroid hyalosis were most common posterior segment pathologies accounting for 4% followed by Posterior staphyloma and Vitreous haemorrhage accounting for 2%

each. One diabetic patient who had recovered from COVID-19 infection did not have any posterior segment pathology on B scan.

Posterior segment pathology and trauma Blunt

trauma with cricket ball was seen in 1 patient and was found to have retinal detachment with Vitreous haemorrhage (2%). Penetrating trauma with iron of sickle was seen in 1 patient (2%). Both were males.

### Discussion

Cataracts constitute an important cause of blindness in India and many of these cases have advanced cataracts precluding visualization of fundus prior to cataract surgery. A recent study showed that results of ultrasonography influenced surgical management in only 7% of eyes with cataract as compared with 17% of eyes with non-cataract media opacities. [4] Fresh Vitreous haemorrhage appears as dots or short lines on B-scan. Old organized vitreous haemorrhage produces a large membranous surface. Posterior vitreous detachment (PVD) is more extensive in vitreous haemorrhage. In Asteroid hyalosis, bright echoes on B-scan are produced by the calcium particles with clear vitreous space located between asteroid opacities and retina. Studies have shown presence of significant posterior segment pathology in eyes with dense cataracts [1,2] most patients in developing countries. In our study we noted that incidence of posterior segment pathology in 50 eyes of patients with dense cataracts was 16%, its almost similar to study done by Anteby et al. (19.6%) [1]. Hanif M and colleagues found that 13.87% of eyes had significant posterior segment pathologies [6], Ali and Rehman reported posterior segment lesions in 11% non-traumatic cataract patients [5]. In study by Haile and Mengistu incidence of detectable abnormalities of posterior segment was 66% [2]. Mean age of patients was 58 years with more males. Similarly more male cases were reported by Lewallen S and Courtright P [7] and Chanchlani M et al. [8] Among the systemic conditions 32% were a known case of diabetes, 8% were less than 40 years of age, 10% had raised IOP and 4% had keratic precipitates. On performing B scan USG, Retinal detachment, PVD, Asteroid hyalosis was most commonly found with an incidence of 4% each. Retinal detachment was commonest PSED detected by B-scan by Qureshi MA and Laghari K [11], Meenakshi V et al. [9] and Jain A et al. [12], who have reported RD prevalence to be 3%, 2.5% and 5% respectively. RD was also reported to be found in up to 9.3% of cases examined by B-Scan by Mendes MH et al. [10] Anteby II et al [1] and Shaikh FU et al [13] had reported posterior staphyloma to be commonest finding by B-Scan USG, 7.2% and 3.5% respectively. Vitreous haemorrhage was found in 2% of patients who were also diabetic. Vitreous haemorrhage was reported in posterior segment B-Scan USG studies to range from 1-3% [5,13] which is similar to present study as higher incidence of proliferative retinopathy is associated with higher incidence of VH. Asteroid hyalosis was found in 2 eyes (4%) in our study whereas Hanif et al showed an incidence of 0.8% (4 eyes) [6] PVD on B scan was seen in 2 eyes which is much

less when compared to study done by Hanif et al where 9 eyes (4.30%) had PVD. [6]

None out of 12 COVID-19 recovered patients were found to have any posterior segment pathology on USG B scan More studies need to be conducted in patients with respect to COVID-19 to conclude regarding posterior segment pathology that could be picked up using USG B scan.

### Conclusion

The COVID lockdown had restricted movement of people delaying arrival of patients to hospital presenting with various painless abnormalities and history of trauma. Elective surgeries like cataract were not being performed in India which led to an increase in number of patients presenting with advanced cataract thereby making the visualisation of fundus and posterior segment difficult. B scan was widely used during this time to examine and assess the posterior segment.

Hence, we conclude that, presence of certain patient and ocular features are associated with a higher incidence of posterior segment abnormalities. There is a need to have a B scan ultrasound machine and to perform one in all patients of trauma and mature cataract for a successful outcome of surgery performed.

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