ORIGINAL RESEARCH PAPER

Ophthalomology

PREOPERATIVE POSTERIOR SEGMENT EVALUATION WITH B SCAN ULTRASONOGRAPHY IN SENILE MATURE CATARACT IN A TERTIARY CARE HOSPITAL.

KEY WORDS:
Ultrasonography, preoperative cataract, retinal detachment, posterior segment pathology.

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ABSTRACT

Aim: Preoperative posterior segment evaluation with B scan ultrasonography in senile mature cataract in a tertiary care hospital. **Materials and Methods:** The present study was conducted on 200 mature cataract patients and either sex was included. All patients underwent an ocular B scan USG for posterior segment evaluation preoperatively. **Results:** 225 eyes of 200 patients have been included in the study .25 Patients had bilateral mature cataracts and 5 patients were one-eyed. The mean age was 50 years.120 Patients were male (60%) and 80 (40%) females. On B scan 16(7.11%) eyes had posterior segment pathology. 7(3.08%) eyes had Posterior staphyloma, 4(1.77%) eyes had a vitreous hemorrhage, intravitreal membrane, chorioretinal thickening, and retinal detachment each was in 2 eyes (0.9%) and one optic disc edema (0.45%) .209 eyes (92.10%) had no posterior segment pathology. **Conclusion:** B-scan is a valuable prognostic tool for ruling out posterior segment pathology in opaque media but it is not a sensitive test for the diagnosis of those pathologies. We concluded that two-dimensional B-scan ultrasound is one of the diagnostic tools for the detection of hidden posterior segment lesions and can be performed routinely in pre-operative cataract patients, which would help in planning for surgical intervention.

INTRODUCTION

Ultrasound is an acoustic wave that consists of an oscillation of particles within a medium. It was first used in ophthalmology in 1956 by the American ophthalmologists, Mundt and Hughes. [1] B (Brightness) mode is useful for a better demonstration of the shape and topographic relationship of lesions in the posterior segment. B-scan was introduced in ophthalmic practice by Baum and Greenwood in 1958.[2] B-scan provides a cross-sectional display of diseased tissues and is valuable in detecting unsuspected posterior segment diseases.

Ophthalmic ultrasonography has become the most important imaging modality for evaluating lesions of the posterior segment having opaque ocular media caused by anterior chamber opacities, dense cataracts, and vitreous hemorrhage, which make clinical examination and ophthalmoscopic examination difficult [3]. The frequency used in the diagnostic ophthalmic ultrasound for the posterior segment is 8–10 Mhz. [4]

Ultrasound is a safe technique, cheaper, easily available, and provides more affordability compared to other imaging techniques such as Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) [5]. Ultrasound is an acoustic wave that consists of an oscillation of particles within a medium. Dynamic scanning is essential for differentiation between retinal detachment and vitreous membranes or tumor and hemorrhage. Its most common use is in a contact mode for evaluation of the posterior segment in eyes with media opacification.[6] Bronson and Turner produced the first contact B-scan method, and ultrasonography became a more practical investigation.[7] B-scan (brightness) mode is more useful than A (Amplitude) scan for a better demonstration of the shape and topographic relationship of lesions in the posterior segment.[8]The purpose of the study is to visualize the posterior segment of the eye with B-scan ultrasound and to find out any posterior segment lesions present in mature cataracts where the fundus cannot be evaluated.

AIMS AND OBJECTIVES

To study the role of B-SCAN as a diagnostic tool in preoperative evaluation of posterior segment in mature cataract patients posted for surgery.

MATERIALS AND METHODS

- The study was conducted on patients with mature cataracts attending tertiary care hospitals from December 2020 to August 2021.
- A total of 225 eyes of 200 patients aged above 50 years were taken into the study of which 120 patients were male (60%) and 80 (40%) females.

Inclusion Criteria

1. Age above 50yrs of either gender.
2. Mature cataract patients.

Exclusion Criteria

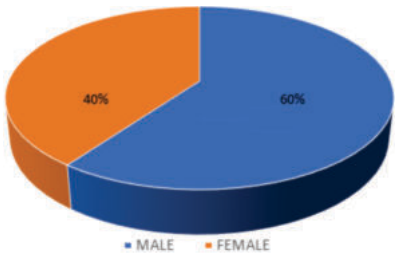
1. Previous history of ocular surgery.
2. Patients already having posterior segment lesions.
3. Presence of penetrating /blunt ocular injury.

A preoperative examination was done which includes the determination of visual acuity, intraocular pressure, pupillary reaction, slit-lamp examination, and biometry.

B-Scan ultrasonography using a standard USG machine with a real-time high-frequency probe with the contact method was done. An ultrasonic probe was placed over the globe with a closed lid after the application of the gel and then transverse, anteroposterior, and longitudinal scans were taken.

OBSERVATION AND RESULTS

DISTRIBUTION OF PATIENTS ACCORDING TO GENDER



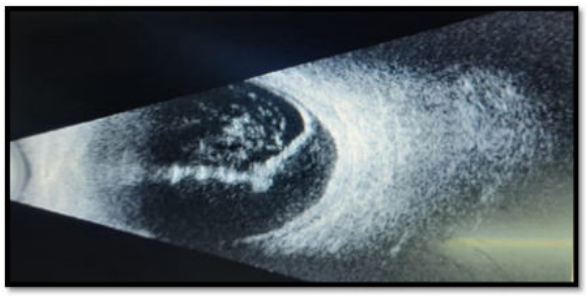


Figure 1: Ultrasonography Of The Globe Shows Retinal Detachment.

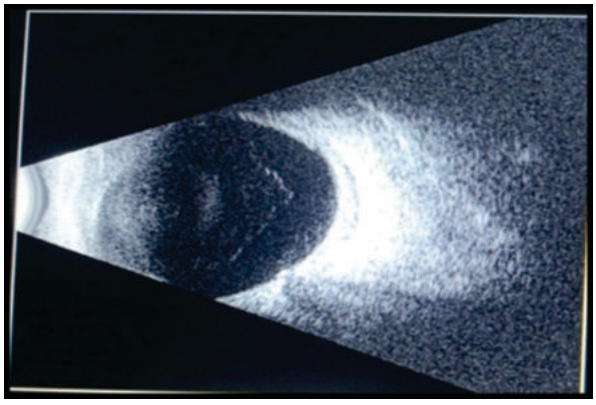


Figure 2: Ultrasonography Of The Globe Shows PVD.

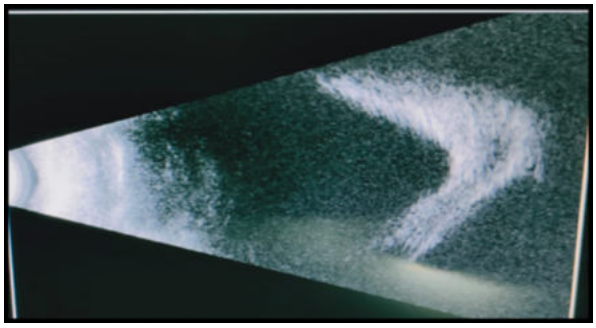


Figure 3: Ultrasonography Of The Globe Shows Posterior Staphyloma.

225 eyes of 200 patients have been included in the study.

- 25 patients had bilateral mature cataracts and 5 patients were one-eyed. The mean age was 50 years .120 patients were male (60%) and 80 (40%) females.
- On B scan 16(7.11%) eyes had posterior segment pathology. 7(3.08%) eyes had Posterior staphyloma, 4(1.77%) eyes had a vitreous hemorrhage, intravitreal membrane, chorioretinal thickening, and retinal detachment each was in 2 eyes (0.9%) and one optic disc edema (0.45%) .209 eyes (92.10%) had no posterior segment pathology.

Table 1: Demographic Data Of 200 Patients

SEX	RURAL	URBAN	TOTAL
Male	44	76	120
Female	20	60	80
TOTAL	64	136	200

Table 2: B Scan Findings

B SCAN FINDINGS	FREQUENCY	PERCENTAGE
No Pathology	209	92.10%
Intravitreal membrane	2	0.9%
Retinal detachment	2	0.9%
Vitreous hemorrhage	2	0.9%
Posterior staphyloma	7	3.08%
Optic disc edema	1	0.45%

DISCUSSION

A cataract is one of the leading causes of treatable blindness in developing countries. visualization of the fundus is important to provide an accurate prognosis for vision after cataract surgery. Under such circumstances, the ultrasonographic examination can provide information regarding such abnormalities.225 eyes of 200 patients have included in the study .25 patients had bilateral mature cataracts and 5 patients were one-eyed. The mean age was 50 years. 120 patients were male (60%) and 80 (40%) female.

On the B scan, 16(7.11%) eyes had posterior segment pathology. 7(3.08%) eyes had Posterior staphyloma, 4(1.77%) eyes had a vitreous hemorrhage, intravitreal membrane, chorioretinal thickening, and retinal detachment each was in 2 eyes (0.9%) and one optic disc edema (0.45%) .209 eyes (92.10%) had no posterior segment pathology. The most frequent abnormality was posterior staphyloma in 7 (3.08%) eyes, which is less than that reported by Ante et al. (7.2%).[9]

Retinal detachment was seen in 2 (0.9%) eyes of which 1 male and 1 was female. Both of these had inferior detachment. Chorioretinal thickening was observed in 2 (0.9%) patients. Both were females. This was probably because of choroiditis. 01 female patient (0.45%) was found to have optic disc edema. Intravitreal membranes were seen in 2 (0.9%) patients; these are not as visually significant as vitreous hemorrhage. When considering ocular features, the presence of posterior synechiae and elevated intraocular pressure was associated with a higher incidence of posterior segment pathology. The majority of the patients were having a history of diabetes as vitreous hemorrhage is more common in proliferative diabetic retinopathy. The most common posterior segment pathology detected in this study was posterior vitreous detachment which differs slightly from other studies done by Mohod et al where retinal detachment was the most common abnormality detected.[10]

Nanda et al discussed in their study about vitreous hemorrhage are the most common posterior segment pathology detected on a B scan followed by retinal detachment.[11]

A study done by Hanif M and colleagues showed that 13.87% of the eyes were found to have significant posterior segment pathologies.

Males in our study having more incidence approach hospitals relatively earlier. Ali and Rehman reported posterior segment lesions in 11% of non-traumatic cataract patients [12]. In the study by Haile and Mengistu 66% incidence of detectable abnormalities of the posterior segment was seen which was very high compared to our findings of 7% [13].

CONCLUSION

B-scan is a valuable prognostic tool for ruling out posterior segment pathology in opaque media but it is not a sensitive test for the diagnosis of those pathologies. We concluded that two-dimensional B-scan ultrasound is one of the diagnostic tools for the detection of hidden posterior segment lesions and can be performed routinely in pre-operative cataract patients, which would help in planning for surgical intervention.

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