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Original Research

Assessment of the intraocular pathologies detected by preoperative B-Scan ultrasound examination in patients having dense cataracts

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ABSTRACT:

Background: Cataract is defined as opacity within the clear lens inside the eye that reduces the amount of incoming light and results in deterioration of vision. Hence; the present study was conducted for assessing intraocular pathologies detected by preoperative B-Scan ultrasound examination in patients having dense cataracts. **Materials & methods:** A total of 100 patients were enrolled. Data pertaining to socio-demographic and other clinical correlates were collected using pre designed structured performa attached. The procedure was explained briefly to the patient for their co-operation. B-scan ocular examination was done using ultrasound machine. If any posterior pathology was detected during basic screening, it was centered on the right side of the echogram to achieve greatest resolution. On follow-up of the patients after cataract extraction surgery, the efficiency of B-Scan ultrasonography was done by comparing the diagnosis post-operatively when fundus was visible clinically by both direct and indirect ophthalmoscope. **Results:** Bilateral involvement occurred in 2 percent of the cases. Senile cataract was seen in 70 percent of the cases. Traumatic cataract was present in 10 percent of the cases. B Scan findings showed normal appearance in 60 percent of the patients while it showed abnormalities in 40 percent of the patients. Posterior vitreous detachment and vitreous degeneration were present in 12 percent and 15 percent of the patients respectively. Posterior vitreous detachment + Vitreous haemorrhage were seen in 8 patients. Overall sensitivity and specificity of B Scan was 97.5 percent and 100 percent respectively. **Conclusion:** B Scan is a magnificent tool in detecting intraocular pathologies in patients having dense cataracts.

Key words: Intraocular, B-Scan

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INTRODUCTION

Cataract is defined as opacity within the clear lens inside the eye that reduces the amount of incoming light and results in deterioration of vision. Cataract is a major cause of vision impairment in many lowincome settings. It remains uncertain as to whether the high levels observed are explained largely by reduced access to cataract surgery or additionally to potential environmental risk factors more prevalent in lowincome settings, such as poor diets, occupational sunlight exposure, and use of biomass fuels. In India cataract has been reported to be responsible for 50-80% of the bilaterally blind in the country. Global agencies for the elimination of avoidable blindness have pledged support to operationalizing strategies to reduce the burden of cataract blindness by the "Vision 2020: The right to sight" initiative.¹⁻³

The eyeball's fluid content and its superficial position make it ideally suited for examination with ultrasonography (USG). USG is the only practical method for obtaining images of the posterior segment of the eye when the light-conducting media are opaque. It is the most useful investigation prior to vitrectomy. B Scan ultrasonography is a noninvasive, efficient, reliable and inexpensive diagnostic technique for evaluation of ocular pathology. Both A scan and B Scan techniques are important for the diagnosis of posterior segment lesion. B (Brightness) mode is useful for a better demonstration of the shape and topographic relationship of lesion in the posterior segment.^{4- 6} Hence; the present study was conducted for assessing intraocular pathologies detected by preoperative B-Scan ultrasound examination in patients having dense cataracts.

MATERIALS & METHODS

The present study was conducted for assessing intraocular pathologies detected by preoperative B-Scan ultrasound examination in patients having dense cataracts. Patients of all age groups diagnosed with dense cataract posted for cataract extraction surgery whose fundus was not visualised clearly with direct and indirect ophthalmoscope fulfilling the eligibility criteria were enrolled. A total of 100 patients were enrolled. Data pertaining to socio-demographic and other clinical correlates were collected using pre designed structured performa attached. The procedure was explained briefly to the patient for their cooperation. B-scan ocular examination was done using ultrasound machine. If any posterior pathology was detected during basic screening, it was centered on the right side of the echogram to achieve greatest resolution. On follow-up of the patients after cataract extraction surgery, the efficiency of B-Scan ultrasonography was done by comparing the diagnosis

post-operatively when fundus was visible clinically by both direct and indirect ophthalmoscope. All the results were recoded and analysed by SPSS software.

RESULTS

35 percent of the patients belonged to the age group of 61 to 70 years while 29 percent of the patients belonged to the age group of 51 to 60 years. Mean age of the patients was 56.8 years. 60 percent of the patients were males while the remaining were females. Right eye involvement occurred in 52 percent of the patients while left eye involvement occurred in 46 percent of the patients. Bilateral involvement occurred in 2 percent of the cases. Senile cataract was seen in 70 percent of the cases. Traumatic cataract was present in 10 percent of the cases. B Scan findings showed normal appearance in 60 percent of the patients while it showed abnormalities in 40 percent of the patients. Posterior vitreous detachment and vitreous degeneration were present in 12 percent and 15 percent of the patients respectively. Posterior vitreous detachment + Vitreous haemorrhage were seen in 8 patients. Overall sensitivity and specificity of B Scan was 97.5 percent and 100 percent respectively.

 Table 1: Age-wise distribution of patients

Age group (years)	Number of patients	Percentage of patients
Less than 20	5	5
20 to 30	3	3
31 to 40	3	3
41 to 50	10	10
51 to 60	29	29
61 to 70	35	35
More than 70	15	15
Total	100	100
Mean	56.8	

 Table 2: Distribution of patients according to type of cataract

Type of cataract	Number of patients	Percentage of patients
Complicated Cataract	12	12
Congenital Cataract	4	4
Metabolic cataract	4	4
Senile cataract	70	70
Traumatic cataract	10	10
Total	100	100

Table 3: B-Scan findings

B-Scan findings	Number of patients	Percentage
Foreign body + Vitreous haemorrhage	4	4
Normal	65	65
Optic nerve druscens	2	2
Posterior Synechae	4	4
Posterior vitreous detachment	12	12
Posterior vitreous detachment +	8	8
Vitreous degeneration		
Vitreous degeneration	15	15
Vitreous haemorrhage	3	3

Postoperative fundus assessment	Number of patients	Percentage
Cupping	4	4
Normal	89	89
Posterior vitreous detachment	5	5
Posterior vitreous detachment +	2	2
Vitreous detachment		
Vitreous detachment	10	10

 Table 4: Post-operative fundus assessment

Table 5: Overall sensitivity and specificity of B Scan

Statistics	Value (%)	95% CI
Sensitivity	97.5	89.12 to 99.11
Specificity	100	97.36 to 100

DISCUSSION

Indications for examination B-scan ultrasound most useful when direct visualization of intraocular structures is difficult or impossible. Situations that prevent normal examination include-Lid problems e.g. severe edema, partial/total tarsorraphy, corneal opacities, scars, severe edema, hyphaema, hypopyon, miosis, papillary membrane, dense cataract, vitreous opacities (e.g. hemorrhage, inflammatory debris). In such case, diagnostic B-scan ultrasound can accurately image intraocular structures and give valuable information and give valuable information on the status of lens, vitreous, retina, choroid, and sclera. 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). Ultrasound is an acoustic wave that consists of an oscillation of particles within a medium. Dynamic scanning is essential for differentiation between retinaldetachment and vitreous membranes or tumour and haemorrhage. Xrays can detect only radiopaque foreign bodies and will miss radioloucent ones. Bscan offers amore accurate localisation of the foreign body, especially in relation to the ocular wall.⁷⁻¹⁰ Hence; the present study was conducted for assessing intraocular pathologies detected by preoperative B-Scan ultrasound examination in patients having dense cataracts.

In the present study, 35 percent of the patients belonged to the age group of 61 to 70 years while 29 percent of the patients belonged to the age group of 51 to 60 years. Mean age of the patients was 56.8 years. 60 percent of the patients were males while the remaining were females. Right eye involvement occurred in 52 percent of the patients while left eye involvement occurred in 46 percent of the patients. Bilateral involvement occurred in 2 percent of the cases. Senile cataract was seen in 70 percent of the cases. Streho M et al in 2019 described the predominant location of RT, the factors influencing their location, and the vitreous status of eyes with RT using US. A prospective study was conducted in all patients diagnosed with RT by B-scan US. The primary endpoint was to assess RT preferential location using US. Secondary endpoints were the rate of posterior vitreous detachment (PVD), number of eyes with multiple RT, and axial length (AL). A total of 101 eyes of 100 patients with RT were included. RT main location was in the superior quadrants (either nasal superior, strictly superior, or temporal superior) in 71% of cases. All patients were diagnosed with PVD by US, and 79% had a vitreous hemorrhage. Twelve eyes (13%) were diagnosed with multiple RT. The mean AL was 24.62 \pm 2 mm, and it was significantly longer in eyes without superior RT. They showed a superior location of RT diagnosed by US in more than two-thirds of cases associated with a significantly shorter AL than in other locations.¹⁰

In the present study, traumatic cataract was present in 10 percent of the cases. B Scan findings showed normal appearance in 60 percent of the patients while it showed abnormalities in 40 percent of the patients. Posterior vitreous detachment and vitreous degeneration were present in 12 percent and 15 percent of the patients respectively. Posterior vitreous detachment + Vitreous haemorrhage were seen in 8 patients. Overall sensitivity and specificity of B Scan was 97.5 percent and 100 percent respectively. Mobin M et al in 2019 studied the B scan ultrasonography before cataract surgery in eyes with dense cataracts. A total of 510 patients and either sex were included. 625 eyes of 510 patients were studied. Of the 510 patients, 40.2% were 61-70 years of age and 61.8% were males. Of the 625 eyes, 78 eyes (12.5%) had one or more than one positive finding on Bscan USG. It was found that the most common findings were R.D and PVD found in 4% and 2% of the eyes respectively followed by posterior staphyloma (1.6%), choroidal detachment (1.6%).and vitreous hemorrhage in 0.8% eyes. Abnormal USG findings were found more frequently among hypertensives (50%) and diabetics (41.7%). Posterior synechiae was in 10.8%. The elevated IOP was observed in 5.9%. B-scan ultrasound has significant importance in the preoperative evaluation of patients with dense cataracts to detect pathologies.¹

CONCLUSION

B Scan is a magnificent tool in detecting intraocular pathologies in patients having dense cataracts.

REFERENCES

- Murthy G, Gupta SK, John N, Vashist P. Current status of cataract blindness and Vision 2020: the right to sight initiative in India. Indian J Ophthalmol. 2008;56(6):489-494.
- Mohan M. Collaborative Study on Blindness (1971-1974): A report. New Delhi, India: Indian Council of Medical Research; 1987. pp. 1–65.
- 3. Foster A. Cataract and "Vision 2020 the right to sight" initiative. British Journal Ophthalmology. 2001;85:635–639.
- Jose R, Bachani D. World bank assisted cataract blindness control project. Indian J Ophthalmol. 1995;43:35–43.
- Minassian DC, Mehra V. 3.8 Million blinded by cataract each year: Projections from the first epidemiological study of incidence of cataract blindness in India. Br J Ophthalmol. 1990;74:341–3.
- 6. Jose R, Bachani D. Performance of cataract surgery between April 2002 and March 2003. NPCB-India. 2003;2:2.
- 7. Mundt GH Jr, Hughes WF Jr. Ultrasonics in ocular diagnosis. Am J Ophthalmol. 1956;41:488–98.
- 8. Baum G, Greenwood I. The application of ultrasonic locating technique to ophthalmology. AMA Arch Ophthalmol. 1958;60:263–79.
- 9. Bronson N R 2nd, Turner FT. A simple B-scan ultrasonoscope. Arch ophthalmol. 1973;90:237-8.
- Resnikoff S, Pascolini D, Etyaale D, Kocur I, Pararajasegaram R, Pokharel GP, et al. Global data on visual impairment in the year 2002. Bull WHO. 2004;82:844–51.
- Streho M, Perrenoud F, Abraham N, Hawa K, Puech M, Giocanti-Aurégan A. Predominantly Superior Retinal Tears Detected by B-Scan Ultrasonography. Journal of Ophthalmology. Volume 2019 |Article ID 7105246
- Mobin M, Kanodia P, Malhotra R, Akaram SM, Yadav D. Role of B scan ultrasonography before cataract surgery in eyes with dense cataracts. Journal of medical science and clinical research. 2019; 7(8): 890-894.