

# A Study of Posterior Segment Evaluation by B-Scan in Hyper Mature Cataract

Madhu Chanchlani and Roshan Chanchlani\*

Department of Ophthalmology, Chirayu Medical College Bhopal, India

\*Corresponding author: Roshan Chanchlani, Department of Ophthalmology, Chirayu Medical College Bhopal, India, Tel: 919752532687; E-mail: roshanchanchlani@gmail.com

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## Abstract

**Purpose:** To study the role of B-scans ultrasound in detection of posterior segment pathology in hyper mature cataract cases.

**Material and method:** This study was conducted in Department of Ophthalmology, Chirayu Medical College and Hospital, Bhopal from October 2012 to October 2014. The study included 400 patients of dense cataract evaluated with high resolution ultrasonography for posterior segment lesions.

**Results:** The cases were divided according to age ranging from 0-80 years. Male predominance was seen with sex ratio 1.38:1 (M:F). Loss of vision and redness of eye were the leading symptoms. Posterior staphyloma was seen in 15 (3.52%) cases, Vitreous hemorrhage in 7 (1.64%), Vitreous membrane in 5 (1.20%), Chorioretinal Thickening in 6 (1.41%), and Retinal detachment 4 (0.94%) cases. Out of 400 patients 79 (19.6%) were having ocular and systemic risk factors like hypertension, diabetes, raised IOP, uveitis, myopia.

**Conclusion:** From the present study it was noted that B-scan is very efficient tool in diagnosing various ocular abnormalities. B-scan can categorize the lesions in the posterior chamber well, depending on the echotexture and anatomy. Preoperative posterior segment evaluation with ultrasound in patients with dense cataract can be used to detect pathologies that may influence the surgical strategy and the postoperative visual outcomes.

**Keywords:** B-scan; Vitreous hemorrhage; Chorioretinal thickening

## Introduction

B-scan ultrasonography is a valuable tool for evaluating the posterior segment in eyes with advanced cataracts. Timely detection of significant posterior segment abnormalities using ultrasound prior to cataract surgery helps to detect pathologies that may influence the surgical strategy and the postoperative visual prognosis. Studies of ultrasonographic evaluation in eyes with opaque media have shown incidence rates of posterior segment pathology to vary from 19.6% to 66% [1,2].

Ophthalmic ultrasonography has become the most important accurate diagnostic imaging modality for directly evaluating lesions of posterior segment having opaque ocular media caused by corneal opacities, anterior chamber opacities, dense cataracts, vitreous hemorrhage, inflammatory opacities which make clinical examination and ophthalmoscopic examination difficult and least informative [3]. Such visualization is considered important to provide accurate prognosis for vision after cataract surgery over the last 30 years, B-scan ultrasonography has greatly advanced which has enabled us to study posterior segment of the eye even in the presence of opaque media like dense cataract. We aimed to study the incidence of significant posterior segment abnormalities in eyes with advanced cataracts precluding a direct visualization of fundus prior to cataract surgery.

## Material and Methods

This study was conducted in Department of Ophthalmology, Chirayu Medical College and Hospital, Bhopal from October 2012 to October 2014. The study included 400 patients of hypermature cataract and 425 eyes were evaluated with slit lamp examination and tonometry. These patients then underwent high resolution ultrasonography. Patients with previous surgery and posterior segment lesions were excluded. B scan was done with Sonomed scan. The probe was placed over the closed eyelid after application of coupling gel.

Sex	Urban	Rural	Total
Male	76	156	232
Female	68	100	168
Total	144	256	400

**Table1:** Demographic data of 400 Patients.

## Discussion

B-scan has proved to become an extremely important tool in the diagnosis of various ocular abnormalities with great accuracy. Its non-invasiveness, cost effectiveness and no exposure to ionizing radiation are some of the added advantage. Ocular abnormalities are believed to be more common in males than in females. In a study done by OP Sharma ocular abnormalities were observed maximum in 4<sup>th</sup> to 5<sup>th</sup>

decades [4]. It should be remembered that although facilities and personnel for performing cataract extraction with intraocular lens implantation are widely available in these countries, facilities for more sophisticated tests such as ultrasonography are less commonly available. Even in centers where ultrasonography is possible, routine evaluation of all patients with advanced cataracts by ultrasonography is time-consuming and of questionable cost-effectiveness. In present study, maximum abnormalities were seen in 6th decade both in males and females. This was seen in American study in 2000 [5]. Males in our study have more incidence as they approach hospitals relatively earlier than females. On B-scan 37 (8.7%) eyes had posterior segment pathology this is lesser than study done by Anteby et al. where the incidence was 19.6% [1] but Ali and Rehman reported posterior segment lesions in 11% non-traumatic cataract patients and in 65.85% patients with traumatic cataract [6]. In the study by Haile and Mengistu 66% incidence of detectable abnormalities of posterior segment were seen which was very high as compared to our findings [7]. A recent study showed that the results of ultrasonography influenced surgical management in only 7% of eyes with cataract as compared with 17% of eyes with non-cataract media opacities posterior staphyloma was found in 15 (3.52%) cases in our series which was higher than in other study where the incidence was (0.73%) [6]. In our study the incidence of Vitreous hemorrhages was 1.64% which was less in comparison to a study where in non-traumatic cases it was present in 2.5% cases [8]. Retinal detachment in our study was seen in 0.94% cases and in another study it was noted in 1.5% [9]. In a recent study done out of the 90 positive cases, 25 (3%) had retinal detachment 14 (2%) had posterior vitreous detachment, and 24 (3%) had vitreous hemorrhage [10]. Among the clinical and systemic features in patient studied in our setup, diabetes mellitus and young age were associated with a greater incidence of abnormalities on B-scan. When considering ocular features, presence of posterior synechiae, coloboma, elevated intraocular pressure, and keratic precipitates were associated with a overall higher incidence of posterior segment pathology.

Posterior Segment Lesions	Frequency (n%)
No Pathology	388 (91.30%)
Posterior Staphyloma	15 (3.52%)
Vitreous hemorrhage	7 (1.64%)
Vitreous membrane	5 (1.20%)
Chorioretinal Thickening	6 (1.41%)
Retinal detachment	4 (0.94%)

Total	425(100%)
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**Table 2:** Frequency of posterior segment pathology.

## Conclusion

Ultrasonographic examination can provide information regarding the posterior segment pathology which helps in explaining accurate prognosis postoperatively though in some disorders such as branch and central retinal vein occlusion, macular hole, diabetic maculopathy, optic atrophy could not be diagnosed preoperatively. Thus, it is advisable that patients undergoing cataract surgery should be warned of these limitations of ultrasonography. We concluded that two dimensional B-scan ultrasound could be used as 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. In cases, where a two dimensional B-scan is not sufficient or helpful, a three dimensional ultrasound can be done.

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