Original Article

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A study of B-Scan Ultrasonography in Detecting Posterior Segment Pathologies in Senile Mature Cataracts

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Abstract

Purpose: To study the role of B-scans ultrasound in detection of posterior segment pathology in cases of senile mature cataract. *Material and method*: This study was conducted in Department of Ophthalmology, Chirayu Medical College and Hospital, Bhopal from October 2012 to October 2017. The study included 1600 patients of mature cataract evaluated with B-Scan 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 1.37:1 (M:F). In this study Posterior staphyloma was seen in 62 (3.87%) cases, Vitreous hemorrhage in 28 (1.75%), Vitreous membrane in 30(1.87%), Chorioretinal Thickening in 25 (1.56%), and Retinal detachment 20 (1.12%) cases. Out of 1600 patients 320 (20.1%) were having ocular and systemic risk factors like hypertension, diabetes, increased IOP, uveitis. *Conclusion*: From, the present study it was noted that B-scan is very efficient tool in diagnosing various ocular abnormalities. Preoperative posterior segment evaluation with ultrasound in patients with hypermature cataract may influence the surgical results and postoperative visual prognosis.

Keywords: B-Scan; Vitreous Hemorrhage; Chorioretinal Thickening.

Introduction

B-scan ultrasonography is a important investigation modality for evaluating the posterior segment in patients with advanced cataracts. In developing countries like India many patients never had an ophthalmic consultation till they present to the hospital for operations [1]. Posterior segment abnormalities using ultrasound prior to cataract surgery helps to detect postoperative visual prognosis. The superficial location of eye with its fluid composition and the advent of high frequency ultrasound make USG ideal for imaging the eye [2]. Ophthalmic ultrasonography has become the important accurate diagnostic imaging study for direct assessment of lesions of posterior segment having opaque ocular media caused by corneal opacities, anterior chamber opacities, dense cataracts, vitreous hemorrhage. USG of eye could also be done at the patient's bedside; dynamic study is also possible with ultrasound system [3,4]. In developing countries, USG has the advantage of being cheap, easily available and affordable, devoid of any ionizing radiation.Careful ophthalmic imaging using ultrasound may result in finer pre-operative detail regarding lens support structures, and may therefore give the surgeon the advantage when planning surgery [5]. We aimed to study the incidence of posterior segment abnormalities in eyes with advanced cataracts precluding a direct visualization of fundus prior to cataract surgery.

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Material and Methods

This study was conducted in Department of Ophthalmology, Chirayu Medical College and Hospital, Bhopal from October 2012 to October 2017.The study included 1600 patients of mature cataract evaluated with B-Scan Ultrasonography for posterior segment lesions was done and theses cases were also evaluated with slit lamp examination and tonometry.Ethical clearance was obtained from institutional review board.

Inclusion criteria

The patients with suspected posterior segment pathology having an opaque ocular media .

Exclusion criteria

The patients with traumatic globe and having active bleeding with other pathologies were excluded.

The patients having opaque media in the form of corneal, lenticular, or vitreous opacity were examined for B-scan evaluation and the patients having clear ocular media but having posterior segment pathologies involving retina, optic nerve, choroid, or sclera were also subjected for B-scan evaluation. Ocular examination with slit lamp was performed to make provisional clinical diagnosis. The patients were subjected to B-scan USG after obtaining informed written consent. The patients were examined in supine position. A coupling gel was applied upon the closed eyelids on which the linear array ultrasound probe was placed. After instructing the patient to keep the eye still as if he is staring at the ceiling, and the scanning was commenced. Gain settings were adjusted as per the requirement.Both eyes were scanned.

Observations

Table 1: Demographic data of 1600 Patients.

Sex	Urban	Rural	Total
Male	273	652	925
Female	265	410	675
Total	538	1062	1600

Table 2: Frequency of posterior segment pathology

Posterior Segment Lesions Frequency (n%)	Frequency (n%)
No Pathology	1440(90)
Posterior Staphyloma	62 (3.87)
Vitreous hemorrhage	28 (1.75)
Vitreous membrane	30 (1.87)
Chorioretinal Thickening	25 (1.56)
Retinal detachment	20 (1.12)
Total	1600 (100)

Discussion

In 1958 with the introduction of B-scanning techniques, Baum & Greenwood created a new application of ultrasound in the sectional study of globe and orbit using real time in evaluation of the eye both voluntary and voluntary movements may be studied [6].

In present study, maximum abnormalities were seen in 6th decade, similar observations were observed in a study in America in the year 2000 [7].

Males in our study having more incidence approach hospitals relatively earlier. Ali and Rehman reported posterior segment lesions in 11% non-traumatic cataract patients and in 65.85% patients with traumatic cataract [8].

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 of 10% [9].

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 Bscan.

In a study by Anteby et al. in non-traumatic cataract group retinal detachment was observed in 3.9%, vitreous hemorrhage in 2.5% and posterior staphyloma 7.6% [11].

Posterior staphyloma was observed in low incidence as compared to this study. i.e. 7.6% vs 3.87%. In another study done by Mendes et al. out of 289 patients with medium to profound opacity of the lens 77.5% presented with vitreous detachment [12].

In 30.1% of the patients, the ultrasound revealed eye abnormalities that could compromise the function of the eye after surgery. The most common of these abnormalities was vitreous opacities (12.1%) followed by retinal detachment (9.3%).

Our study observations were markedly less than these observations which could be due to the fact that they examined the patients evaluated during cataract surgery.

Conclusion

Ultrasonographic examination can provide information regarding the posterior segment pathology.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 which can help in planning for operation.

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