

TOPIC:“ROLE OF B-SCAN ULTRASONOGRAPHY IN ADVANCED CATARACT”

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- NO FINANCIAL INTEREST TO DISCLOSE
- ETHICAL CLEARANCE WAS OBTAINED FROM HOSPITAL ETHICAL COMMITTEE



INTRODUCTION

- B-scan ultrasonography is a simple, non invasive tool useful for diagnosing significant abnormalities in posterior segment of eyes with opaque media like advanced cataracts, corneal opacities ,uveitis, total hyphema etc.
- It was first used in 1956 in the field of ophthalmology by American ophthalmologists Mundt and Hughes.¹
- ³Oksala et al reported the sound velocities in the various components of the eye.²Baum and Greenwood came up with two dimensional immersion scan which was subsequently improved upon by Purnell and coleman.^{4,5}



- Contact B scan was introduced by Borson⁶ and it being portable, became part of everyday use in ophthalmology.
- The technique of standardised echography was first used by Dr.karl ossoing ,and refers to the combined use of contact B-scan (brightness modulation), and a standardized A-scan (amplitude modulation) to evaluate ocular and orbital pathology.

- **ULTRASOUND PRINCIPLE**

Sound waves are generated at the tip of the transducer which has a Piezo-electric crystal of quartz or ceramic. These high frequency waves from the probe are transmitted to the area of interest and received back as radiofrequency signals and reconstructed in the form of image and displayed as echograms. The sound wave is measured in hertz (HZ).



- Techniques available to do B-scan ultrasonography are contact scan and immersion scan.
- In contact scan , there are two types
 - 1.open eye contact scan
 - 2.closed eye contact scan
- In immersion scan there are two types
 - 1.mini immersion scan
 - 2.water bath immersion scan
- B-scan setup used for this study was Marvel II/A B-scan with UBM by appasamy assosiciation(2021) with a probe ferequency of 12MHZ was used.
- Technique implemented was contact B- scan in closed eye .



Aim of the study

- To evaluate the posterior segment pathology using B-scan ultrasonogram in patients with advanced cataract posted for cataract surgery which would be of help in planning for surgical intervention and to assess post operative visual prognosis.

- **OBJECTIVES:**

- 1) To evaluate the posterior segment pathology in advanced cataracts pre-operatively.
- 2) To assess the visual prognosis after cataract surgery.



- MATERIALS AND METHODS

SAMPLE SIZE:130 patients

STUDY PERIOD: November 2020 to September 2021

STUDY SETTING: Department of ophthalmology, Tertiary care hospital ,Vizianagaram.

STUDY DESIGN: prospective diagnostic study.

- INCLUSION CRITERIA

- 1.Age group from 30- 80 years

- 2.Both sexes

- 3.Advanced cataracts



4. In patients where fundus cannot be viewed by ophthalmoscopy.

5. patients already not known to have any posterior segment pathology.

- EXCLUSION CRITERIA

1. patients already diagnosed with posterior segment pathology .

2. In patients where fundus can be viewed by ophthalmoscopy.

3. unwilling patients



• EVALUATION:

- A DETAILED HISTORY
- BEST CORRECTED VISUAL ACUITY
- INTRA OCULAR PRESSURE
- ANTERIOR SEGMENT EVALUATION WITH SLIT LAMP
- B-SCAN ULTRASONOGRAPHY IS DONE USING CONTACT METHOD IN CLOSED EYES AFTER APPLYING OCULAR SAFE GEL .(Marvel II/A B-scan with UBM by appasamy assosiation was used)
- Laboratory tests, Hematological tests and CT/MRI imaging are done based on need.

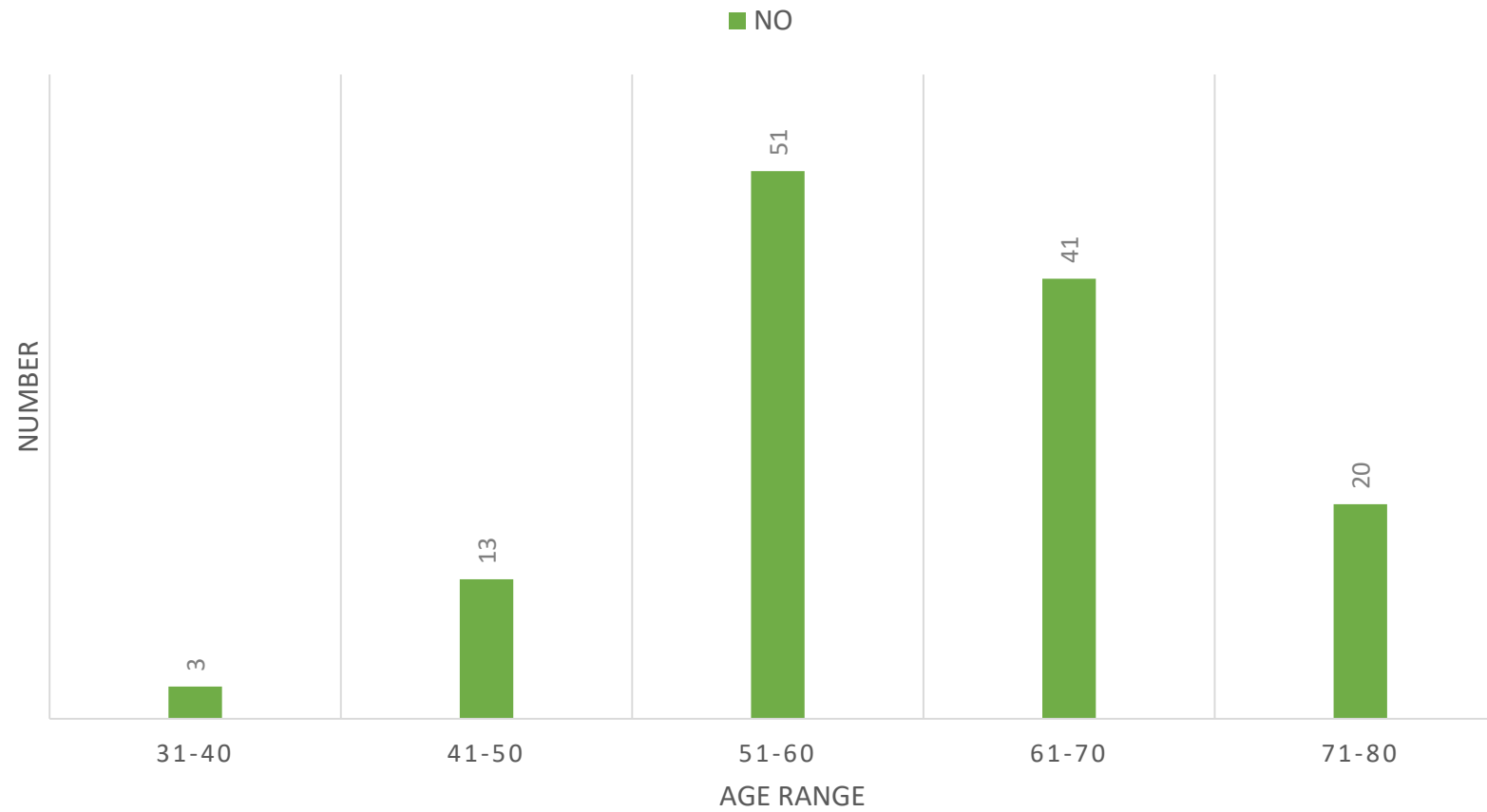


RESULTS

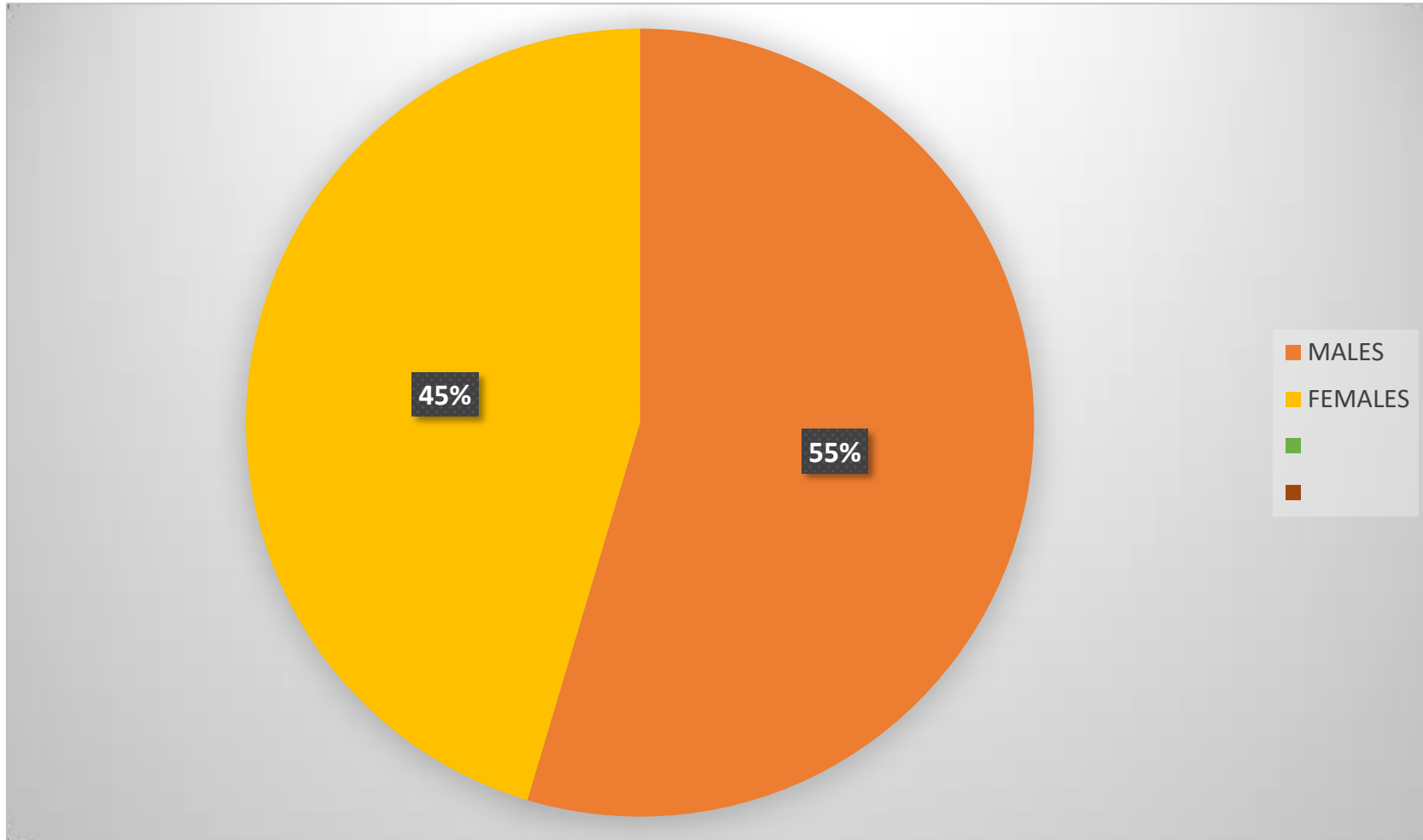
- The data is collected and results are analysed using statistical package social sciences(SPSS)
- The study includes 130 patients age range between 30 to 80 years with gender distribution of 71 males and 59 females. Laterality of right eye is 67 and left eye is 63. a total of 125 non traumatic cases and 5 traumatic cases are observed.
- Out of 130 cases 71(54.61%) cases showed posterior segment pathology with distribution of 8.39% showing asteroid hyalosis, 2.29% showing vitreous hemorrhage, 3.07% showing retinal detachment ,1.5% showing posterior staphyloma and 10% showing posterior vitreous detachment,0.77%(1 case) showing PHPV.



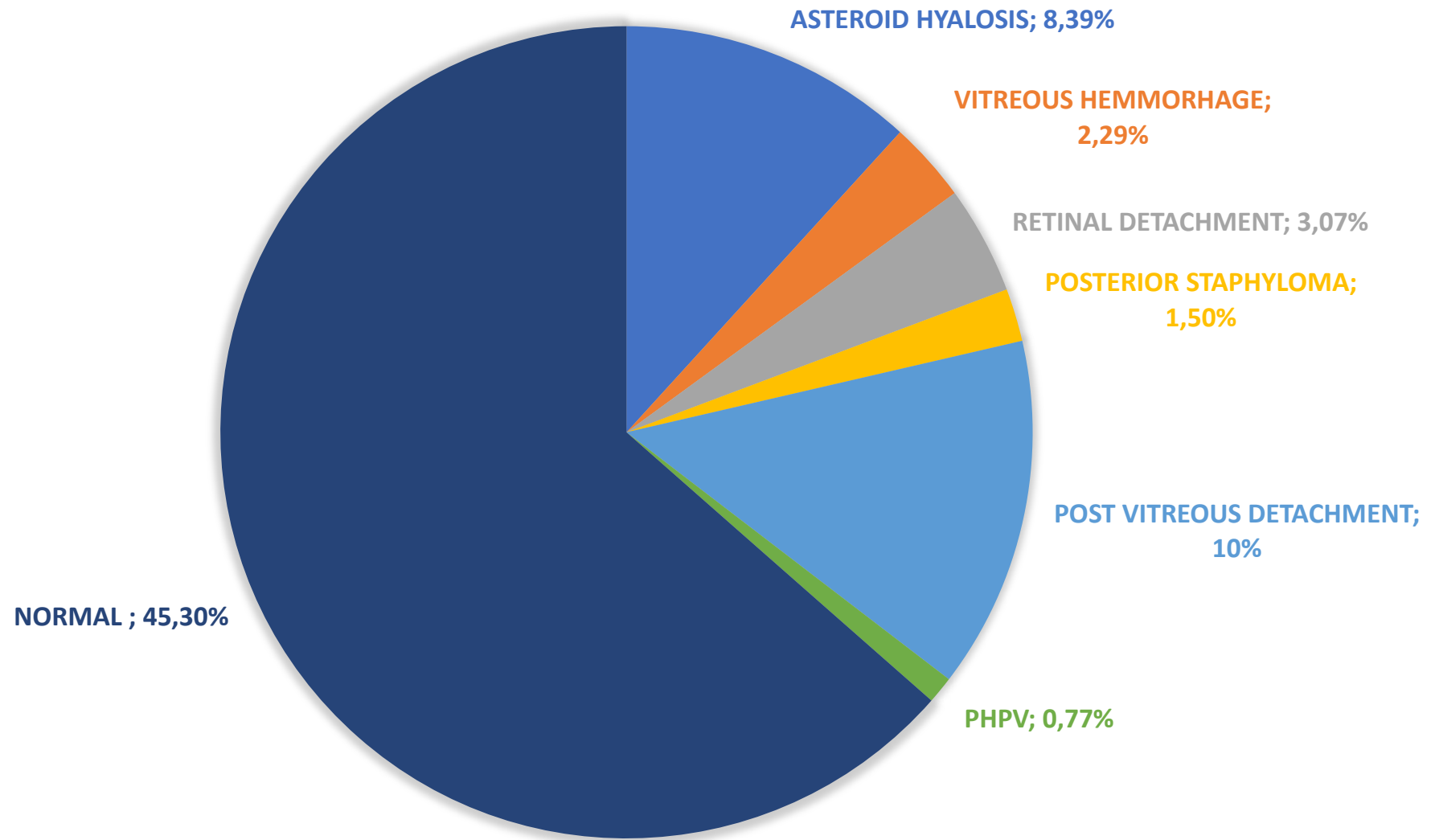
- AGE DISTRIBUTION



- SEX DISTRIBUTION



POSTERIOR SEGMENT PATHOLOGY DETECTED ON B-SCAN

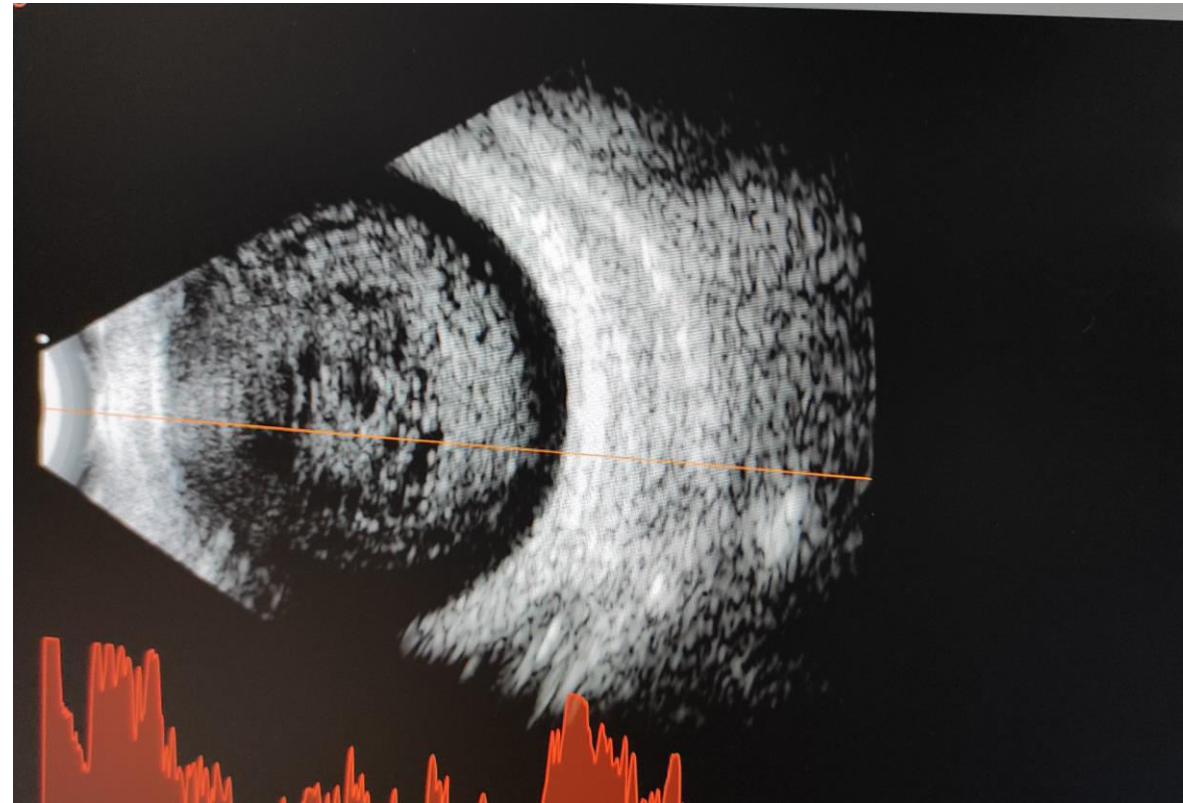


ASTEROID HYALOSIS

It is clinically characterized by presence of calcium crystals embedded in an amorphous matrix

On B-scan multiple densely packed homogenously distributed echodense dots of medium to high reflectivity .

Usually localized to the core of vitreous body ,a clear retrovitreal or pre retinal space is seen.

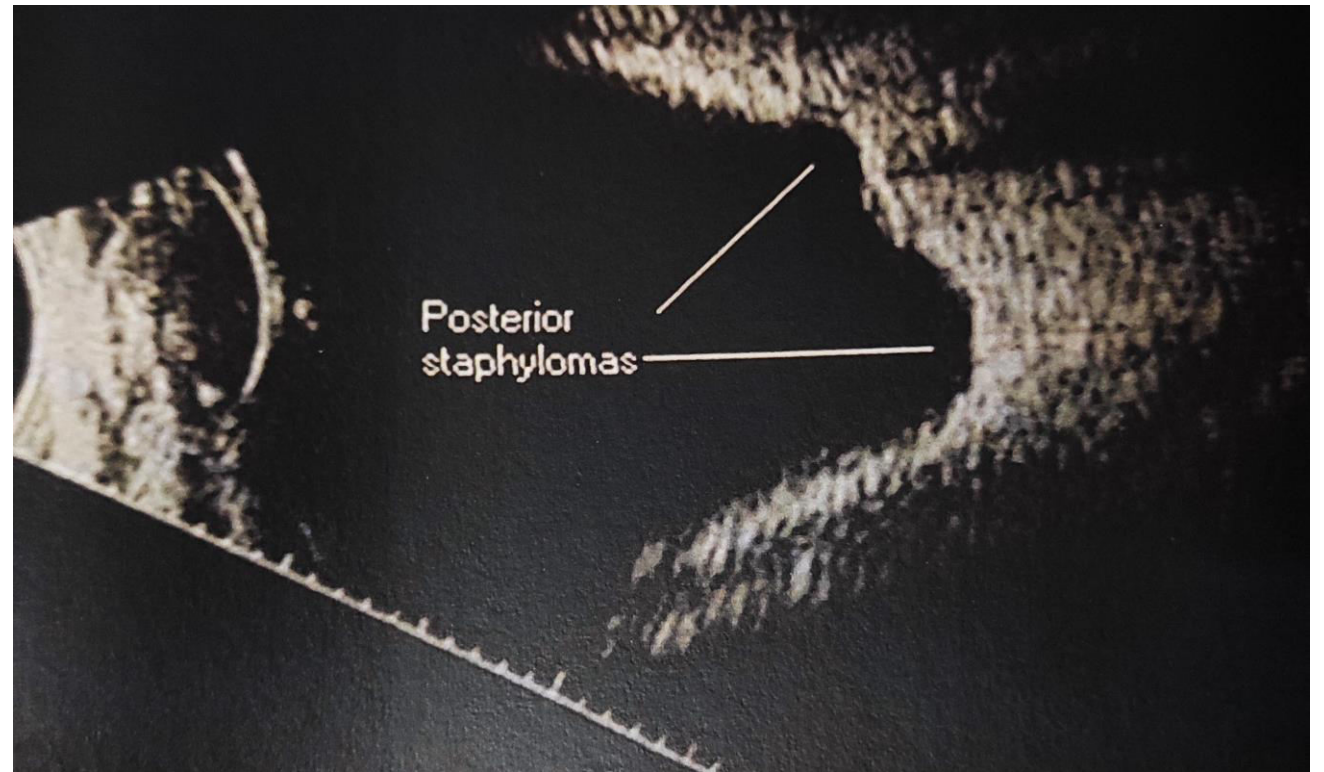


POSTERIOR STAPHYLOMA

A common finding observed in high myopes

On B-scan it appears as sudden bowing back of globe with thinning of retino choroidal layer.

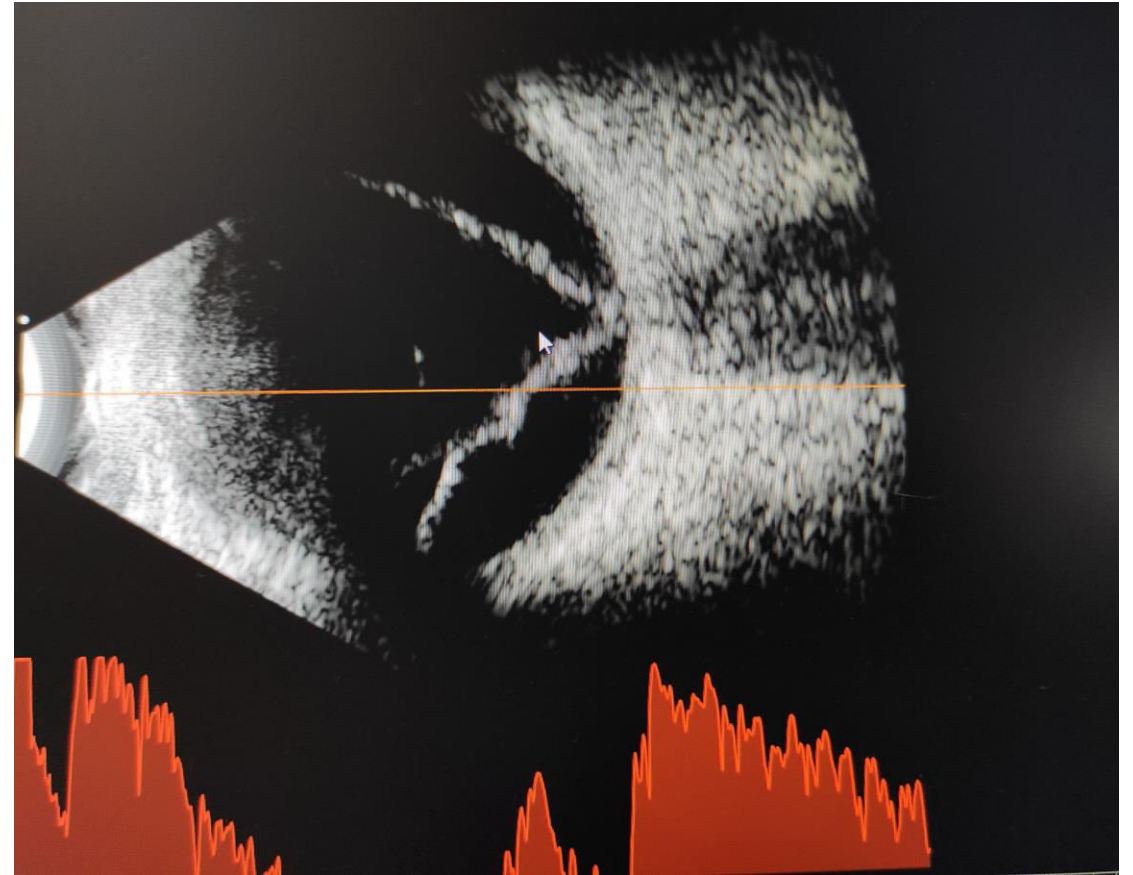
Usually seen at post pole and axial length of globe is increased.



RETINAL DETACHMENT

It means separation of neurosensory retina from pigmentary retina.

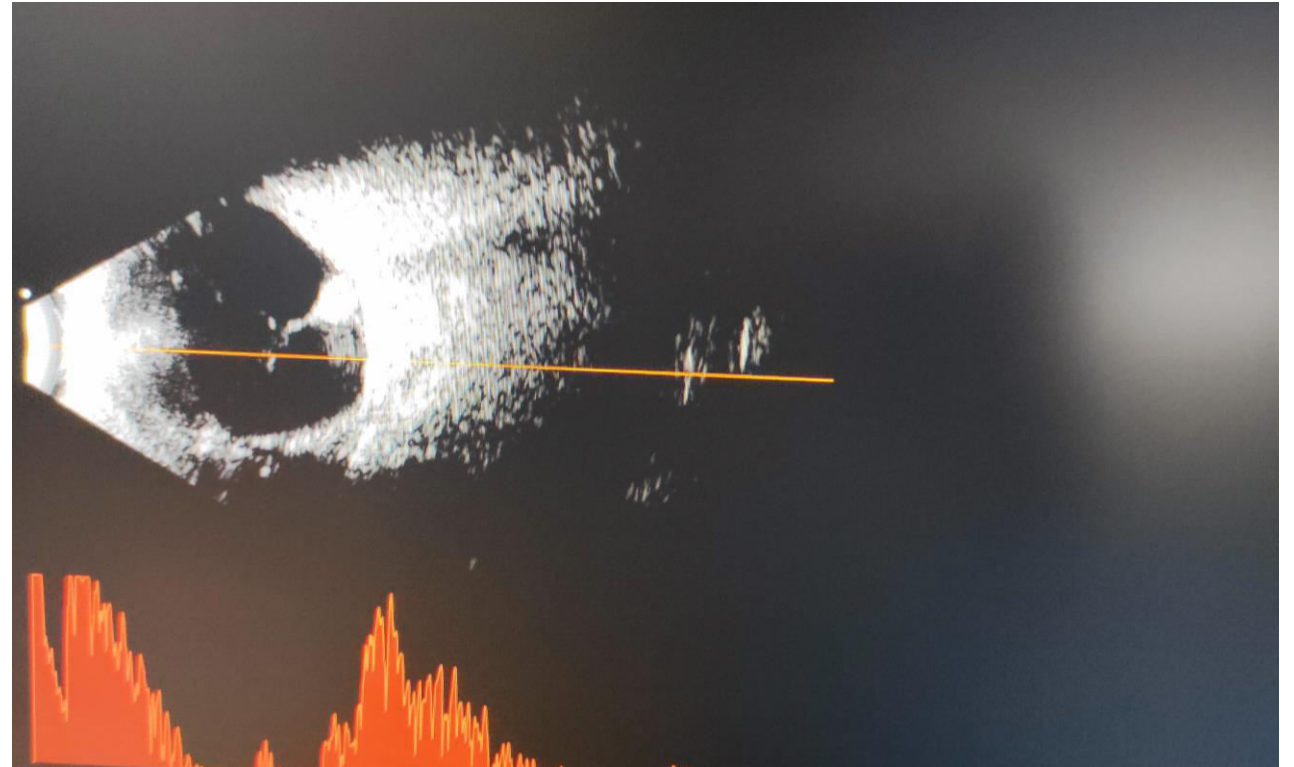
On b-scan it appears as echogenic dense membrane ,biconvex or biconcave with 100% attachment at the optic nerve head.



PERSISTENT HYPERPLASTIC PRIMARY VITREOUS

It is developmental disorder of the eye which occurs due to abnormal persistence of fetal intra ocular vasculature .

On b-scan an echogenic band extending from posterior surface of lens to optic nerve head is observed.



- DISCUSSION

- Over the last 30 years ,ultrasonography has greatly advanced which has enabled us to study posterior segment of the eye even in the presence of opaque media like dense cataracts . It can used for detection of lesions in anterior segment and orbit also.
- Bello TO et al⁹ in 2006 found that in a prospective study of patients with dense cataracts sent for ultrasonography .In total 80 patients ,Total retinal detachment was noted in 3 eyes (2.59%),A left partial retinal detachment was observed in 1 eye (0.87%),2 eyes with total retinal detachment in conjunction with vitreous hemorrhage were noted in single patient (1.72%),this correlates with study as we found 3.07% of retinal detachment out of 130 patients



- In Qureshi et al study ,posterior staphyloma was seen in 0.6% of cases and in 7.2% cases in Bluementhal EZ study.our study showing 1.5%.
- Zafer et al study demonstated 9.08% of cases with posterior vitreous detachment ,our study showing 10% of cases.



CONCLUSION

- We conclude that b-scan ultrasound could be one of the diagnostic tools for detection of hidden posterior segment lesions and could be performed routinely in pre-operative assessment of patients having dense cataracts ,which would be helpful in planning for surgical intervention and to assess visual prognosis.



REFERENCES

- 1. Mundt GH, Hughes WF. Ultrasonics in ocular diagnosis. Am J Ophthalmol. 1956
- 2. Baum G, Greenwood I. The application of ultrasonic locating technique to ophthalmology. Arch Ophthalmol. 1958
- 3. Till P, Osoining KC. Ten year study on clinical echography in intraocular disease. Bibl Ophthalmol. 1975
- 4. Hodes BL. Eye disorders: Using ultrasound in ophthalmic diagnosis. J Postgrad Med. 1976.
 - 5. Bello TO, Adeoti CO. Ultrasonic assessment in pre-operative cataract patients. Niger Postgrad Med J. 2006



- 4. Zafar D, Sajad AM, Qadeer A. Role of B-Scan ultrasonography for posterior segment lesions. Pak J LUMHS. 2008
- 5. Qureshi MA, Laghari K. Role of B-scan ultrasonography in preoperative cataract patients. Int J Health Sci (Qassim). Jan 2010



THANK U

