



ROLE OF B SCAN ULTRASOUND IN POSTERIOR SEGMENT PATHOLOGY OF EYE

Radiodiagnosis

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ABSTRACT

Imaging plays a very important role in diagnosis and management of intraocular pathologies. It helps to differentiate whether the lesion is in anterior segment or posterior segment. Usg is usually the first radiological modality that is used as it is safe, noninvasive, portable and cost effective.

Material and Methods: 75 patients having intraocular and intraorbital lesions were studied and their usg and postoperative findings were compared to make a final diagnosis to ultimately ensure the importance of B scan in pathologies of posterior segment.

Result: Diagnosing and characterizing the abnormalities with great accuracy by B-scan not only helps in preoperative cases but also changes the management of various other Patients. B scan does play a major role in the diagnosis of the pathologies of the posterior segment. However in few diseases it fails to differentiate among few lesions and need of a higher investigation is felt. But as an independent modality it does play an important role in the diagnosis of posterior segment pathologies

KEYWORDS

B scan ultrasonography, Vitreous hemorrhage, Vitreous detachment, Retinal detachment, Retinoblastoma

1. Introduction

Eye is affected by spectrum of pathological conditions occurring in all age groups from new born to old age. Many posterior segment lesions occurring in the eye can be evaluated accurately by high resolution sonography since clinical and ophthalmoscopy are less informative [1]. Standardized echography has proved to be highly accurate for the detection and differentiation of intra ocular disorders [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]. B-scan is also indicated in the presence of clear ocular media for evaluation and differentiation of intra ocular tumors, ocular inflammatory diseases such as unexplained retinitis and choroiditis [2]. Diagnostic ophthalmic ultrasonography is the first line of investigation in suspected Vitreo retinal diseases with opaque media. It is possible to identify, evaluate and follow numerous conditions such as retinal tears, vitreous and retinal detachments, vitreous hemorrhage, sub retinal hemorrhage, eccentric disciform lesions.

Ultrasonography is the powerful non invasive diagnostic tool for accurate diagnosis, differentiation of intra ocular tumors and information regarding the size, location, extension, acoustic characteristics of the tumors which are critical for the management [3]. Ocular trauma is a major cause of vision loss particularly in young populations. In these cases B-scan provides useful information regarding the presence of ocular foreign body of any kind when other radiological investigations (X-Ray) become negative [4]. B-scan gives exact location of foreign body in the eye and also the extent of damage to surrounding tissues such as lens, vitreous, retina and guides in the therapeutic decision related to late effects of ocular trauma [5]. Ocular sonography is painless, non-invasive, safe, rapid, cost-effective, non-ionizing real time diagnostic tool that provides valuable diagnostic information of various ophthalmic disorders not obtainable by any other means [6]. B-scan can be repeatedly performed to assess the various responses to therapy since ocular sonography has no adverse effects and is cost effective [7]. Colour Doppler imaging has role in evaluation of intraocular tumors and also to differentiate vitreous haemorrhage from retinal detachment.

2. Material and methods

The present study was carried out during the period of December 2015 to January 2017. Most of the patients were from ophthalmology department New civil hospital, Surat and few patients were from the other department like medicine. Patients were selected on the basis of having opaque media e.g. hyphema, cataract, corneal opacity, vitreous hemorrhage and suspected cases of intraocular tumour

vitreous hemorrhage, retinal detachment etc and first the clinical diagnosis is made then the radiological diagnosis is made, then these findings are compared with intraoperative findings to make a final diagnosis

3. Discussion

In this study the youngest patient was a female of 1 day age oldest patient was of 80 years. Maximum number of patients were in the age group of 41 to 50 years out of these patients total of 50 males (66%) and 25 females (33%) were there. Most of the patients that were referred from the eye opd were referred for opaque media and among these patients' most of the patients were presenting with trauma (40%) and most common site of involvement was vitreous (30 cases 40%) followed by retina.

4. Clinical presentation of Patients

Clinical Presentation	NIMISHA et al	Harsh et al	Present study
Dimness of vision	45	22	12
Trauma	41	34	40
Loss of vision	3	10	6.66
Proptosis	3	26	22.66
Swelling	6	10	6.66
Congenital Blindness	2	0	4
Pain, watering, redness, throbbing, headache	0	4	8
Total	100	100	100
USG finding	Nimisha et al	Harsh et al	Present study
Vitreous hemorrhage	12	10.66	16
Vitreous detachment	16	6.66	14
Choroidal detachment	6	2.66	8
Retinal detachment	30	14.66	18
Foreign body	6	12	16

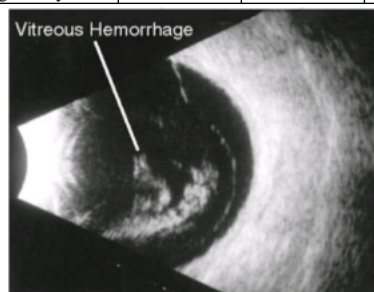


Figure 1. Vitreous Hemorrhage with retinal detachment

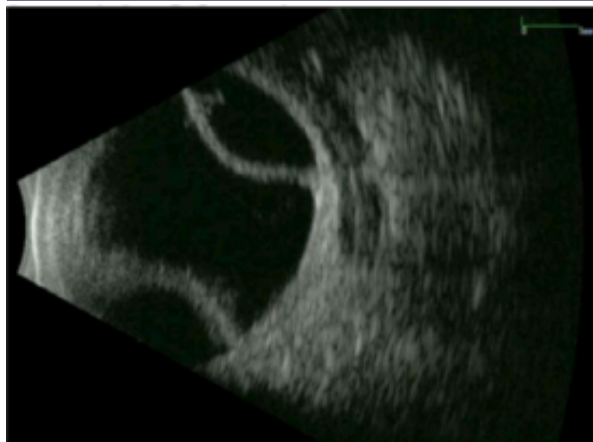


Figure 2. Choroidal detachment

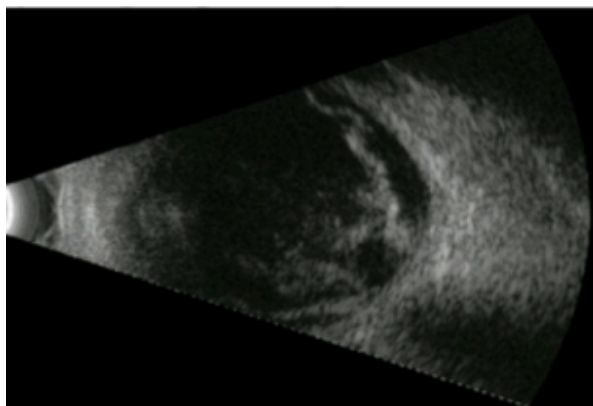


Figure 1. Vitreous Hemorrhage with retinal detachment

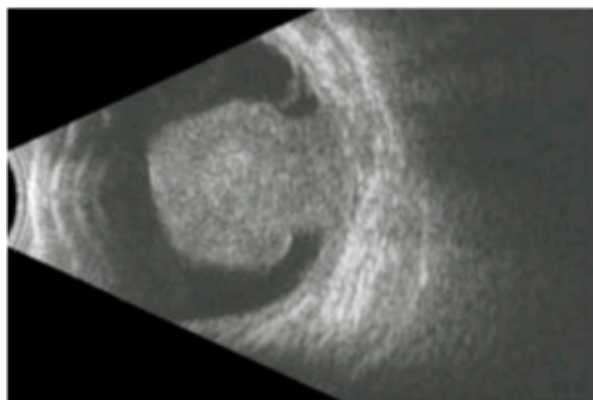


Figure 4. Choroidal melanoma

5. Comparative study in case of lesions afflicting posterior segment

Among the patients having vitreous lesions most of them were having vitreous hemorrhage (8 cases) followed by vitreous detachment (5 cases). 9 patients with vitreous pathology presented with foreign body. Out of total number of patients referred from eye opd, 61 % were having intraocular lesion and 22 % had extraocular lesion. 23.33 % of patients presented with vitreous hemorrhage and 30 percent of patients presented with foreign body in situ. In cases that presented with proptosis 29.4 percent were having pseudotumour or thyroid ophthalmopathy followed by lymphoma/hemangioma 23.52 percent. USG was found to be 100 % specific in diagnosing vitreous hemorrhage, vitreous detachment, foreign body, asteroid hyalosis, Choroidal detachment and supra choroidal hemorrhage.

6. Conclusion

Ultrasound is a non invasive ,rapid , safe and sensitive method for differentiating orbital pathology Differentiation of the orbital pathologies required high frequency and high resolution ultrasound .it is the only study that allows to study the dynamic assessment thus

assessing floaters. B scan is specially useful for trauma and foreign bodies. For complete ophthalmic USG, B scan should be combined with A scan and colour doppler. B scan does play a major role in diagnosis specifically the pathologies of posterior segment of eye however in few of the situation the B scan fails to differentiate between various pathologies e.g. between thick vitreous and retinal detachment B scan can't be used in open globe injury. Diagnosing and characterizing the abnormalities with great accuracy by B-scan not only helps in preoperative cases but also changes the management of various other patients. Its non-invasiveness and no exposure to ionizing radiation is an added advantage. However, experience and understanding of the principles are essential for accurate diagnosis.

References

- [1] McNicholas MM, Brophy DP, Power WJ, Griffin JF. Ocular sonography. *AJR Am J Roentgenol* 1994 Oct;163(4):921-26.
- [2] Byrne SF, Green RL. Physics and instrumentation. In: *Ultrasound of eye and orbit*. 2nd ed. St Louis: Mosby; 2002. pp.1-14.
- [3] Brandy C. Hayden, Linda Kelly, Arun D. Singh. Ophthalmic ultrasonography: Theoretic and practical considerations. *Ultrasound clinics*. [online] 2008 Apr; 3(2):179-8 Available from: doi:10.1016/j.cult.2008.04.007. [Accessed 19 Oct 2008]
- [4] Bhatia IM, Panda A, Dayal Y. Role of ultrasonography in ocular trauma. *Indian J Ophthalmol*. 1983 Sep;31(5):495-8.
- [5] Chugh JP, S, Verma M. Role of ultrasonography in ocular trauma. *Indian J Radiol Imaging* 2001;11(2):75-79.
- [6] Sharma OP. Orbital sonography with its clinicosurgical correlation. *Indian J Radiol Imaging* 2005;15(4):537-54.
- [7] McLeod D, Restori M. Ultrasonic examination in severe diabetic eye disease. *Br J Ophthalmol*. 1979 Aug;63(8):533-8.