

THE ROLE OF OCULAR ULTRASOUND IN EVALUATING PATIENTS WITH OCULAR TRAUMA

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ABSTRACT

Aim: To evaluate the role of ocular ultrasound in evaluating patient with ocular trauma. **Method:** This was a retrospective conducted at Prince Rashid Bin Al Hassan military hospital and Princess Haya military hospital between November 2015 and December 2018. All patients who attended to the ophthalmology clinic suffering from eye trauma and underwent ocular ultrasounds were included in the study. The medical records of those patients were reviewed regarding age, gender, the outcome of ocular trauma. The results of the B scan ultrasound were recorded and compared with other method of imaging obtained like CT scans or MRI. The results also will be compared with the outcome of ocular examination. **Results:** 200 patients aged between 3 and 72 years (mean 28.5 ± 12.1 years) had ocular trauma and underwent B scan ocular ultrasound. 67% of the patients were males and 60% of cases were between 20 and 40 years of age. 67% of cases (134 patients) had normal ultrasound examination. 33% of cases (66 patients) showed intraocular pathology; Vitreous hemorrhage (38%) followed by posterior vitreous detachment (30%) were the most common findings. The accuracy rate of ultrasound was 96% with 98% specificity and 93% sensitivity. **Conclusion:** B scan ultrasound was very accurate with high rate of specificity and sensitivity in detecting ocular complications of trauma. This will greatly improve the visual outcome and decrease the ocular morbidity which may result from trauma. It is recommended to perform B scan ocular ultrasound to every patient presented to the emergency room with ocular trauma.

KEYWORDS: B scans ultrasound, Ocular trauma.

INTRODUCTION

Ocular trauma is one of common causes of emergency room visits. It constitutes 3% of cases attending to the emergency room and it is responsible for about half million of blindness cases in the world.^[1,2] Imaging is very important in evaluating the integrity of eye structures following ocular trauma. However, sometimes limitations may exist which makes it difficult to perform more advanced imaging like computed tomography (CT) or magnetic resonance imaging (MRI) related to availability, time consumed, age of the patients, level of consciousness and when there is suspicion of the presence of intra ocular metallic foreign body.^[3] Ultrasound have many advantages in that it is easily accessible, less time consumption and no patients preparation or anesthesia is required in pediatric cases.^[4,5]

The aim of this study is to evaluate the accuracy, specificity and sensitivity of ocular ultrasound in patients with ocular trauma.

METHOD

This was a retrospective conducted at Prince Rashid Bin Al Hassan military hospital and Princess Haya military hospital. All patients who attended to the ophthalmology clinic suffering from eye trauma and underwent ocular ultrasounds were included in the study. The medical records of those patients were reviewed regarding age, gender, the outcome of ocular trauma. The results of the B scan ultrasound were recorded and compared with other method of imaging obtained like CT scans or MRI. The results also will be compared with the outcome of ocular examination. The obtained results were analyzed. Patients who lost their follow were excluded from the study.

RESULTS

200 patients aged between 3 and 72 years (mean 28.5 ± 12.1 years) visited the emergency department for ocular trauma between November 2015 and December 2018. 67% of the patients were males and 60% of cases were between 20 and 40 years of age. 67% of cases (134 patients) had normal ultrasound examination. However, 5 patients later showed intraocular pressure pathology as follow: 4 patients had intraocular foreign body diagnosed

by CT scan, one patient had posterior rupture globe diagnosed clinically on exploration. 33% of cases (66 patients) showed intraocular pathology that are shown in table 1.

Table 1

The ocular pathology	Number of patients	Percentage
Vitreous hemorrhage	25	38%
posterior vitreous detachment	20	30%
retinal detachment	12	18%
ruptured globe	9	15%
intraocular foreign body	8	12%
lens dislocation	2	3%
choroidal detachment	2	3%

3% of patients who were diagnosed to have Vitreous hemorrhage were found to have posterior vitreous detachment upon clinical exam and 2% of patients who were diagnosed to have posterior vitreous detachment eventually were found to have retinal detachment on clinical examination.

The accuracy rate of ultrasound (percentage of true positive and true negative) in the present study was 96% with 98% specificity and 93% sensitivity.

DISCUSSION

Ocular trauma is commonly seen in ophthalmology practice. Early and accurate detection of ocular pathologies resulting from trauma is important in minimizing the risk of subsequent ocular morbidity and visual loss.^[6] In this study ocular trauma was seen more in males than females ageing between 20 and 40 years, that's probably most of the injuries during particular types of work in which the employees are mostly men.

In 67% of cases the ultrasound did not show any ocular pathology. However false negative results were seen in 5 patients; 4 of them had intra ocular foreign bodies which were by CT scan. CT was performed because of high index of suspicion by clinical examination and in all cases the size of the foreign body was 5mm or less. The remaining eye with intra ocular foreign bodies of >5mm size were detected by ultrasound. Ultrasound failed to detect posterior globe rupture in one patient who presented to the emergency department by days after the trauma, by this time spontaneous closure of the wound might took place which made it difficult to appear on ultrasound.

About one third of cases ultrasound was able to detect intra ocular pathology. The most common intraocular pathology seen by ultrasound was Vitreous hemorrhage followed by posterior vitreous detachment. Those results were comparable to that found in other studies.^[7,8,9] On the other hand ultrasound failed to detect the presence of posterior vitreous detachment which was mistaken for vitreous hemorrhage in two patients and in one patient posterior vitreous detachment was mistaken for retinal detachment which was detected by clinical examination.

Finally, B scan ultrasound showed 96% accuracy in detection of ocular pathologies resulting from trauma. Along with detailed clinical examination B scan ocular ultrasound was very effective in detecting ocular pathologies that permits early and effective management to be presented to the patients with ocular trauma.

CONCLUSION

B scan ultrasound was very accurate with high rate of specificity and sensitivity in detecting ocular complications of trauma. This will greatly improve the visual outcome and decrease the ocular morbidity which may result from trauma. It is recommended to perform B scan ocular ultrasound to every patient presented to the emergency room with ocular trauma.

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