

Case Report

Ultrasound Diagnosed Traumatic Bilateral Cataractous Ectopia Lentis: A Case Report and Review

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Received: 05.06.2023

Accepted: 13.07.2023

Published: 16.07.2023

Journal homepage:<https://www.easpublisher.com>**Quick Response Code**

Abstract: Introduction: Ectopia lentis is defined simply as lens displacement which may either be partial or complete. It most commonly results from orbital trauma in over fifty percent (50%) of cases, and majority are unilateral. However, traumatic bilateral ectopia lentis is rare. Hereditary connective tissue diseases may also cause ectopia lentis (usually bilateral). The role of imaging is very crucial in early identification of ocular pathologies following trauma. Ocular sonography, being the cheaper, safer and very readily available modality in most low and middle income countries, becomes handy in the initial imaging work-up of patients with ocular trauma. **Objectives:** To report a rare case of traumatic bilateral cataractous ectopia lentis in an elderly female patient. To review pertinent literature about this condition. To justify the role of various imaging modalities, and particularly highlight the usefulness of ultrasound for evaluating cases of ocular trauma especially in emergency situations. **Case Report:** The case of a 75-year old female who had blunt trauma to her eyes, and never sought immediate specialized medical care, but instead chose to patronise a traditional healing home. Her visual impairment gradually deteriorated, necessitating a late presentation for imaging at our private radiodiagnostic facility in Agbor, Nigeria. Imaging using ocular sonography, revealed bilateral displaced cataractous lenses with associated vitreous haemorrhage, necessitating an immediate, but a late referral for specialized care. **Conclusion:** Emergency ocular sonogram is of utmost importance in cases of acute ocular trauma, as it can help identify ocular pathologies promptly.

Key words: Ectopia lentis, ocular trauma, sonography.

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INTRODUCTION

Ocular trauma means injury to the orbit (eye globes and or the eye sockets) [1]. It is a major cause of visual impairment Worldwide, with significant number of cases occurring in industrial workplaces [1, 2].

Globally, about 1.6 million people are reported to be blind from eye injuries, with about 2.3 million people who have bilateral visual impairment, while 19million have unilateral visual loss [1].

Ocular injuries may be due to; mechanical injuries (blunt or penetrating), chemical agents, ultraviolet and ionizing radiation [1, 3]. Trauma to the orbit may result in blow-out fracture of the orbital wall, injuries to specific parts of the globe such as injuries to the cornea, iris, lens, detachment of either the posterior vitreous membrane, retina or choroidal layer, carotico-cavernous fistula, optic nerve head, globe rupture, as

well as lodgement of foreign bodies within the orbit [1-3].

Lens dislocation also called ectopia lentis, refers to a misalignment or displacement of the crystalline lens [4] It may be partial or complete. The most common cause of ectopia lentis is blunt trauma to the eyes, accounting for over 50% of all cases of lens dislocation [3, 5].

Systemic connective tissue diseases such as Marfan's syndrome, Ehlers-Danlos syndrome and Homocystinuria, have been reported as known causes of bilateral lens dislocation [3-6]. Lens dislocation may also occur post-cataract surgery due to dehiscence of the zonular fibres [4].

Some cases of ectopia lentis have been described in the literature [7-9].

Imaging plays a pivotal role in the initial assessment of patients with orbital trauma.

Magnetic resonance imaging has an excellent soft tissue resolution. It however may not be too feasible to perform in emergency situations because of the long duration for image acquisition. It is not a readily available modality especially in resource poor regions such as in Sub-Saharan Africa, due to its high cost of purchase and maintenance. It is contraindicated when there are metallic intra-orbital foreign bodies.

Computed tomography is regarded as the imaging modality of choice when evaluating orbital trauma [3]. It has good bony and soft tissue resolution, eliminates superimposition of structures and allows for multiplanar image reconstruction. It is however relatively expensive when compared to ultrasonography, and also produces ionizing radiation with its attendant deleterious effects to the human body.

Ultrasonography on the other hand is useful in assessment of the traumatic globe in emergency situations. It is cheap, readily available and non-ionizing, hence its safety. It is however contraindicated when a ruptured globe is suspected. An emergency ultrasonography of the orbit is also very essential in that it can help identify ocular pathologies timely, necessitating the need for an urgent referral for specialist care and further investigation. This is of particular importance in rural African communities where Computed tomographic and Magnetic Resonance Imaging Scanners are not readily available, making ultrasonography the most commonly available modality in most primary, secondary and some tertiary health care facilities.

CASE DESCRIPTION

We report the case of a 75-years old female farmer who had blunt trauma to both eyes from a blow when she was involved in a fight about fifteen (15) years prior to presentation. She subsequently developed blurred vision soon after the trauma. She never sought

immediate orthodox medical care, but rather, she visited a herbal practitioner who applied several unknown concussions on her eyes, with resultant worsening of her symptoms. The patient claimed she later presented at a medical facility in Southern Nigeria, where she underwent an unnamed ocular surgery and thereafter she enjoyed an improvement in her sight. This, however was temporary as her sight later progressively became worse.

She is a known hypertensive, but not diabetic. In her quest for better sight, she later visited an optometrist who then referred her to our private facility in Delta State, Nigeria. For imaging, precisely ocular sonography.

Ultrasonography of both orbits was performed using a Toshiba ultrasonic scanner (Xario 100) 2016 model with a high frequency linear array transducer (7-12 MHz). It revealed bilaterally symmetrical globes with axial lengths within the normal range. Also worthy of note is the presence of thickened and densely echogenic lenses of both eye globes being malpositioned and dislocated posteriorly within the vitreous chamber of each globe; the dislocated left lens was restricted by thin transversely oriented vitreous bands suggestive of posterior vitreous detachment. There were peri-lenticular debris bilaterally. There were also mixed echogenic, but predominantly low level echoes floating within both vitreous compartments, more marked on the left, consistent with vitreous haemorrhage. The optic discs and optic nerve heads appeared preserved sonographically.

An impression of traumatic cataractous bilaterally dislocated lenses with vitreous haemorrhage and left posterior vitreous detachment was made. The patient was counselled and immediately referred to the nearby tertiary health care facility for specialist (Ophthalmologist) intervention.

Ocular sonograms acquired are shown in figs. 1, 2 and 3 below.

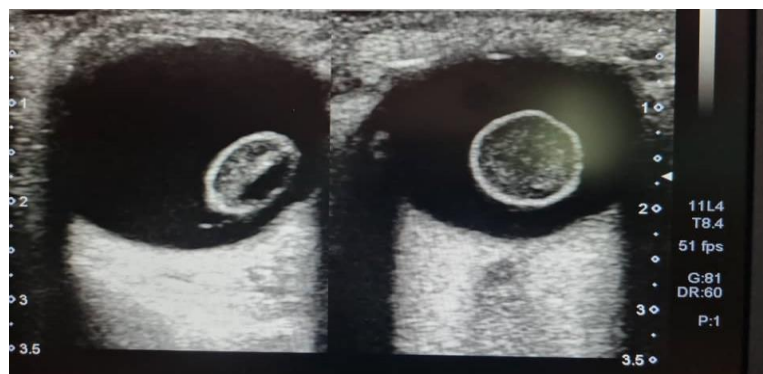


Fig. 1: Ocular sonogram showing posteriorly dislocated and displaced lenses within each globes. The lenses also show thickened echogenic walls. Presence of low level internal echoes are noted within both vitreous compartments



Fig. 2: Right ocular sonogram acquired in the transverse plane, showing the posteriorly displaced cataractous lens of the right eye. Of note are the perilenticular strands and debris

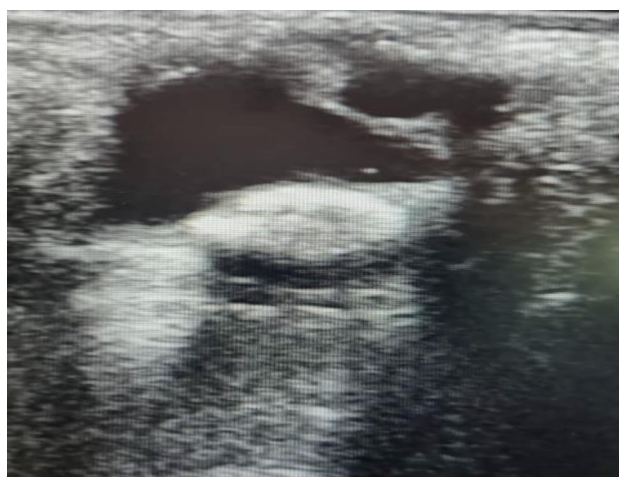


Fig. 3: Left ocular sonogram in the transverse plane showing posteriorly dislocated left lens, vitreous degeneration and hemorrhage. Shaggy appearance of the outline of the left globe is also noted.

DISCUSSION

Blunt ocular trauma accounts for majority of reported cases of lens dislocation, with only a few reported cases caused by connective tissue disorders, post-cataract surgeries, and other miscellaneous causes [3,5] Most of the traumatic cases occurred in the young and middle aged groups.

The findings of bilaterally dislocated cataractous lens, vitreous detachment and hemorrhage which is being reported in our patient can be primarily ascribed to trauma and chronic neglect. The immediate and remote role and value of the prior ocular surgery our patient had before her visual impairment became worse, cannot be completely ascertained. However, one the singular fact that she had a blunt trauma to both globes preceding the reduced vision, is enough risk for ectopia lentis. Her low level of education, social class and occupational status (farmer), could have been responsible for her not seeking the required prompt medical attention for her condition.

The fact that ultrasonography at presentation could identify multiple ocular pathologies, clearly underscores the importance of ultrasonography which could have also identified the primary pathology of bilaterally dislocated lenses abinitio. Keith *et al.*, [9] had earlier highlighted the high sensitivity of ultrasound in identifying ectopia lentis when they reported a similar case of a 64-year old man; a victim of multiple physical assault, whose diagnosis of bilateral ectopia lentis was initially missed on computed tomographic scanner, but was rather identified during ocular sonography.

Most reported cases of traumatic ectopia lentis are usually unilateral, while reports of complete bilaterally dislocated lenses are rare, with only a few reported cases in the literature [9-11].

Complete bilateral posterior lens dislocation is very rare compared to anterior dislocation [10].

Omar *et al.*, [10] had previously described the case of a bilateral posteriorly dislocated lens as a result of road traffic accident in an otherwise healthy child in 2017. The direction of dislocation in our case is similar to that described by Omar *et al.* Although, the lenses described in our case are already cataractous. This can be attributed to the long duration of neglect between when the trauma occurred, to when our patient had presented for imaging. Also, age related (senile) changes may be partly contributory.

Hereditary connective tissue diseases such as Ehlers-Danlos syndrome, Marfan syndrome and Homocystinuria, have been implicated as causes of bilateral ectopia lentis. The lenses in such cases are usually subluxed, rather than a complete dislocation as seen in cases of trauma like that being reported by us [12, 13]. It is important to note that the lenses subluxates superiorly and temporally in Marfans syndrome, while in homocystinuria, they are subluxed inferiorly and medially. The histories of trauma, as well as the absence of a hereditary component or clinical evidence to suggest a connective tissue disease, are also important pointers to trauma being the culprit in this reported case.

CONCLUSION

Orbital trauma is the commonest cause of dislocated lens, with unilateral lens dislocation being commoner. Although, traumatic bilateral lens dislocation is relatively rare, imaging plays a crucial role in the prompt identification of this pathology.

An emergency ultrasonography of the orbit is of utmost immediate importance, in that it can help identify ocular pathologies timely, necessitating the need for an urgent referral for specialist care. This is of particular importance in rural African communities where advanced imaging modalities like Computed tomographic and Magnetic Resonance Imaging (MRI) Scanners are not readily available.

REFERENCES

1. Fasika, Woreta., E. T. *Published online by BMJ Best Practice*. 29May 2023.
2. Shashikala, P., Sadiqulla, M., Shivakumar, D., & Prakash, K. H. (2013). Profile of ocular trauma in industries-related hospital. *Indian journal of occupational and environmental medicine*, 17(2), 66. DOI: 10.4103/0019-5278.123168
3. Wayne, S., & Kubal, M. D. (2008). Imaging of orbital trauma. *Radio Graphics*, 28, 1729-1739. Doi: <https://doi.org/10.1148/rg.286085523>
4. Hoffman, R. S., Snyder, M. E., Devgan, U., Allen, Q. B., Yeoh, R., Braga-Mele, R., & ASCRS Cataract Clinical Committee. (2013). Management of the subluxated crystalline lens. *Journal of Cataract & Refractive Surgery*, 39(12), 1904-1915. DOI: 10.1016/j.jcrs.2013.09.005
5. Arthur, J., Schubert, B., & Topp, S. S. (2019). Traumatic ocular lens dislocation. *African Journal of Emergency Medicine*, 9(2), 106-107. Doi: 10.1016/j.afjem.2019.01/001
6. BASS, L. J., & POTTER, J. W. (1985). A case of spontaneous dislocated lenses. *Optometry and Vision Science*, 62(5), 352-356.
7. Eken, C., Yuruktumen, A., & Yildiz, G. (2013). Ultrasound diagnosis of traumatic lens dislocation. *Journal of Emergency Medicine*, 44(1), e109-e110.
8. Frasure, S. E., Saul, T., & Lewiss, R. E. (2013). Bedside ultrasound diagnosis of vitreous hemorrhage and traumatic lens dislocation. *The American Journal of Emergency Medicine*, 31(6), 1002-e1.
9. Boniface, K. S., Aalam, A., Salimian, M., Liu, Y. T., & Shokoohi, H. (2015). Trauma-induced bilateral ectopia lentis diagnosed with point-of-care ultrasound. *The Journal of Emergency Medicine*, 48(6), e135-e137. DOI: <https://doi.org/10.1016/j.jemermed.2015.01.004>.
10. AlShehri, O. A., Almarzouki, H., Alharbi, B. A., Alqahtani, M., & Allam, K. (2017). Bilateral posterior crystalline lens dislocations in an otherwise healthy child. *GMS Ophthalmology Cases*, 7. Doi: 10.3205/oc000077
11. Kunavisarut, P., Intarated, C., & Pathanapitoon, K. (2009). Bilateral traumatic anterior crystalline lens dislocation by watersplash during Songkran festival: case report. *Journal of the Medical Association of Thailand= Chotmaihet Thangphaet*, 92(11), 1544-1547.
12. Neely, D. E., & Plager, D. A. (2001). Management of ectopia lentis in children. *Ophthalmology clinics of North America*, 14(3), 493-499. Doi: 10.1016/S0896-1549(05)70247-9.
13. Jensen, A. D., & Cross, H. E. (1972). Surgical treatment of dislocated lenses in the Marfan syndrome and homocystinuria. *Transactions-American Academy of Ophthalmology and Otolaryngology*, 76(6), 1491-1499.

Cite This Article: Irabor P.F.I & Izevbekhai S.O (2023). Ultrasound Diagnosed Traumatic Bilateral Cataractous Ectopia Lentis: A Case Report and Review. *EAS J Radiol Imaging Technol*, 5(4), 91-94