

Migrated Intracranial Falling Bullet, Crossed Midline Twice in a Conscious Patient

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Abstract

Our reported case is a 40-years-old male with history of penetrating head injury by a falling bullet, crossed midline twice (at time of injury and during spontaneous migration). The patient of our report was conscious at presentation and showed moderate visual field defect. Although reported morbidity and mortality is high in such injuries, our patient survived with less morbidity and a subjective visual improvement after surgical removal of the bullet.

Keywords: Falling bullet injury; Penetrating brain injury; Migration; Surgical removal

Received: May 31, 2016; **Accepted:** June 21, 2016; **Published:** June 26, 2016

Introduction

A falling bullet injury secondary to shooting bullets into the sky as part of celebration traditions in the Middle East is a source of high concern for medical and social experts [1]. High mortality and morbidity rates were reported in these injuries [2]. Different factors contribute to the falling bullet injury such as the velocity of the bullet, crossing midline, and associated vascular injury. However migration of these bullets is a well-known fact that has been reported to occur in 4.2% of the cases [3], being caused by understood mechanisms like gravity and primary tract effect. Variability in clinical pictures in these cases is an attractive issue addressed by Neurotraumatology to help in decision making when managing such cases, with special concern given to when surgical interference is required [4].

Case Report

A 40 years old male patient exposed to a falling bullet injury to the cranium ((AK-47) (**Figure 1**) during the event of celebrating the Libyan revolution victory in Benghazi. The Patient was primarily managed in Libya and Tunisia, where reports showed that he presented a right occipital cut wound, GCS (14). Initial CT-scan for brain, and skull X-ray Illustrated a left frontal settled bullet with right occipital bone fracture (entry site), and intra-ventricular hemorrhage (**Figures 2 and 3**). Management constituted of wound debridement and external ventricular drain for approximately one week. Follow up skull X-ray (after 3 months) showed migration of the bullet to the right occipital area, where the patient complained from headache (**Figure 4**). Afterwards the patient reported visual field problem in the left visual field. The patient showed clinical improvement with regards to the level of consciousness but no improvement was

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Citation: Abdulrahman AL, Shudifat, Kefah Taha, et al. Migrated Intracranial Falling Bullet, Crossed Midline Twice in a Conscious Patient. Med Case Rep. 2016, 2:2.

detected concerning the visual defect. After four months, the patient was referred to our department (Lund-Sweden) and possible bullet removal was requested by the patient as a result of his concerns regarding the bullet's mobility and possible complications of his vision. Thereafter, he underwent a right occipital craniotomy and removal of the bullet with debridement



Figure 1 Falling bullet (AK-47).



Figure 2 Pre-op CT-scan.



Figure 3 Pre-op X-ray.



Figure 4 Follow up X-ray after three months.

of the surrounding capsule and granulated tissue, Samples were sent for culture to exclude infection. Post-operative course was smooth without complications, meanwhile he was maintained on antibiotics for one week, and he was sent back home after three weeks. CT-scan for brain after two months was remarkable (**Figure 5**). Interestingly, the patient showed subjective gradual improvement of his vision over four month's period as reported by him (also to compare both pre and post-op visual field).

Discussion

Penetrating brain injury is life-threatening condition with dismal sequel. Our understanding of physics of missile injury explains the difference in severity and clinical presentation, the type of weapon and trajectory of bullet before and after brain penetration being the most likely distressing factors [5]. Migration of these bullets is not so common in literature with a consensus about significant sequences of this event [6,7], while crossing midline twice (at time of injury and during migration) has additive effect on morbidity [8,9].

Controversy in the management of such cases is still an unsolved issue, yet, there is a consensus on the general guidelines about wound care and removal of accessible bullets with minimal complications [10]. Also, conservative management is considered a valid option in other reported cases.

Fortunately, our patient did not suffer from any known early complications such as CSF leak, epilepsy and infections, which may have contributed significantly to morbidity. Despite the improvement after surgery of the visual field defect which the patient suffered from after the migration reporting, we do not know whether this deficit is due to the primary bullet injury or the secondary bullet migration reaction; this needs more verification and follow-up. Ultimately, emphasis on neurological situation is an important outcome-predicting factor and plays crucial role in taking decisions for the management of such cases.



Figure 5 Post-op CT - scan.

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