

Occult Gunshot Injury in a Game Park: A Case Report

Oyun Parkında Ateşli Silah Yaralaması: Olgu Sunumu

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Abstract

Rising firearms brutality has been causing much public worry in Turkey. Gunshot wounds to the head have become a main cause of death and permanent neurological disabilities. Computed tomography scans are the gold standard of imaging for gunshot wounds to the head. Patients with Glasgow Coma Scale scores of more than 8 or brain lesions limited to a single lobe of the brain can benefit from early surgery. Mortality rates in the literature differ from 23% to 92% and are significantly higher in patients admitted in a poor neurological status. The doctors who face the victims in emergency rooms must take an additional active role in formulating and maintaining new public health policies which aim to reduce the prevalence of gunshot injuries. In this paper we report a case in which the victim is an eight year old boy who had a complete recovery after receiving a gunshot wound to the head.

Key words: Gunshot Injury, cranial, surgery

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Özet

Artan ateşli silahla şiddet olayları Türkiye'de halkda korku yaratmaktadır. Kranial ateşli silah yaralanmaları ölümlerin ve kalıcı nörolojik hasarların önemli bir nedenidir. Bu yaralanmalarda seçilecek görüntüleme yöntemi bilgisayarlı tomografi'dir. Glasgow koma skoru 8'den fazla olanlar ve lezyon tek lobda sınırlı ise hastalar erken cerrahiden fayda görebilirler. Literatürde ölüm oranı %23-%92 arasındadır ve bu oran kötü nörolojik durumda başvuranlarda belirgin daha fazladır. Acil servislerde bu kurbanlarla karşılaşan doktorlar ateşli silah yaralanmasının önlenmesinde ve yeni halk sağlığı politikalarının belirlenmesinde aktif rol almalıdırlar.

Bu vaka bildiriminde başından yaralanmış 8 yaşındaki çocuğun operasyon sonrası tam iyileşmesi bildirilmiştir.

Anahtar kelimeler: Ateşli silah yaralanması, kranial, cerrahi tedavi

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Introduction

Rising firearms violence has been causing much more public disquiet in Turkey in recent years. Because of the steady increase in urban violence, gunshot wounds to the head have become one of the very important causes of death and permanent neurologic disabilities (1, 2). Most of the victims are young males (3).

Gunshot injuries of the head are the most lethal of gunshot wounds and most of the victims do not survive up to reaching the neurosurgeon (3). Despite the fact that appropriate treatment of cranial gunshot injuries is applied, the mortality rate is higher when compared with gunshot wounds of other part of the body (2).

Computed tomography (CT) scans are helpful in assessing the extent of brain damage such as the missile tract, lesion extension, hematomas and location of bone fragments and missiles, so that CT has an effective role in the management of gunshot wounds to the head (4).

Patients with Glasgow Coma Scale scores of more than 8 or brain lesions limited to a single lobe of the brain can benefit from early

surgery (4). Overall, the patient admitted with a low score in the Glasgow Coma Scale, with a wound that crosses the midline or which damages the cerebral ventricles, would have a bad prognosis (2).

In this paper we report a case in which the victim is an eight year old boy who had a complete recovery after having been shot in temporal region of the head.

Case Description

An eight year old boy was brought by his family to our emergency department. The patient reported suddenly hearing a loud noise behind his left ear and did not lose consciousness. On arrival, the patient's Glasgow coma score was 15 (E=4, V=5, M=6). Clinical examination revealed a one cm split laceration above the left pinna. There was blood in the external auditory meatus but no noticeable cerebrospinal fluid leak. There was no evidence of cranial or peripheral neuropathology. Radiological examination such as skull radiography and urgent computerized tomography was performed.

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Computerized tomography revealed a fracture of the left temporal bone and a metal fragment. There was no evidence of hemorrhage. (Figure 1).

Following consultation with Maxillofacial and Ear Neck Throat surgeons the patient was taken to theatre. Antibiotic and anti-tetanus prophylaxis was started. Patient was discharged with full recovery and his Glasgow Coma Scale score was 15 (E=4, V=5, M=6). (Figure 2) On the follow ups he has had no neuropathology.

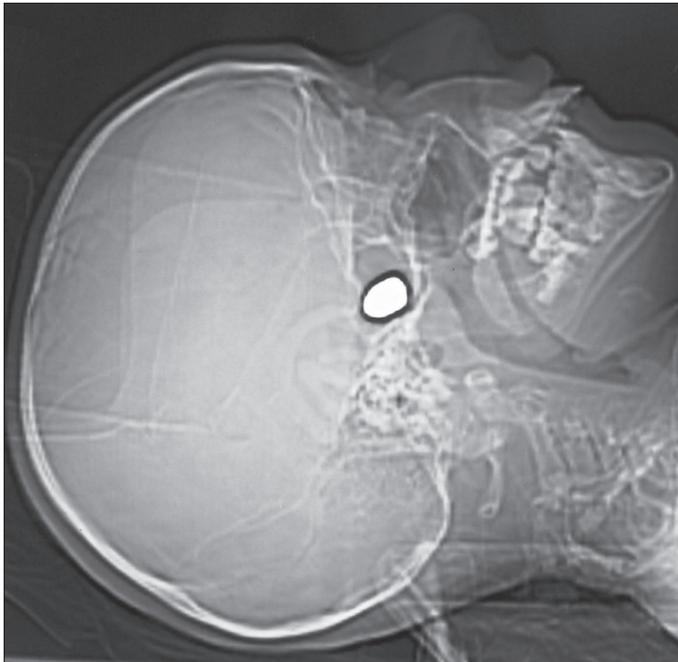


Figure 1. Computed Tomography scans revealed left temporal bullet

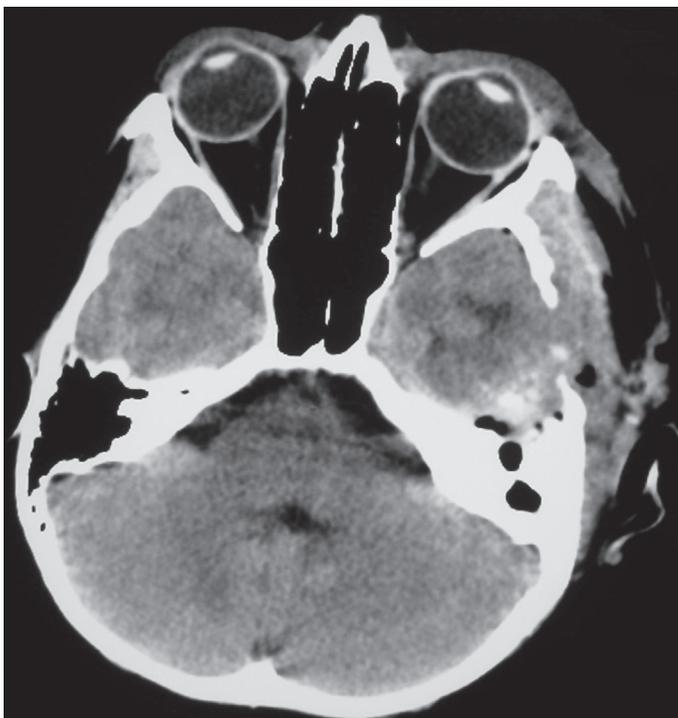


Figure 2. Post operation Computed Tomography scan

Discussion

Since the brain is an organ with vital functions, a gunshot injury of the head has high morbidity and mortality. Mortality rates in the literature range from 23% to 92% and are significantly higher in patients admitted in a poor neurologic status (4).

Most of the gunshot wounds to the head studies have been focused on demographics, outcome, histological, forensic and anatomical findings, or complications like infections, seizures, vascular injuries and psychological effects (5).

There are basically two different mechanisms by which a projectile harms brain tissue. The projectile causes direct destruction that causes a permanent projectile path, secondly the radial acceleration causes lateral displacement with expansion, compression and shearing in the affected tissue layers distant from projectile path resulting in a temporary wound cavity (6).

Low Glasgow Coma Score at admission, unilateral dilated pupils or medium fixed pupils, trans-ventricular or bi-hemispheric central trajectory and bi-lobar or multi-lobar wounds noted through CT scans can afford useful information for planning the surgical procedure and prognostic factors of high morbidity and mortality in patients with gunshot wounds to the head (2, 4).

There is substantial inconsistency among neurosurgeons in the management of gunshot wounds to the head (3). Most authors recommend aggressive and early debridement of necrotic tissue with removal of foreign bodies for decreasing infection risk and mortality rates (2). On the other hand, some authors recommend less aggressive methods and surgical treatment for only intracranial, subdural and epidural hematoma drainage when these lesions are associated with mass effect and midline shift (2). Also, recent papers have even reported no surgical intervention gain, the same or better outcome (7). The bullets within the parenchyma should be removed if reasonably accessible and if it can be removed without causing additional neurological damage (8). In this case, the bullet was easily accessible, it has not crossed the midline and only a lobe was harmed. For this reason we decided on early surgery.

Common complications of gunshot wounds to the head are infections frequently associated with cerebrospinal fluid fistula, seizures, and vascular injuries such as traumatic aneurysm (8). In this case, we hope that our decision of early surgery for the child could prevent any future complications.

Prevention is the best solution to gunshot wounds to the head. We must seriously work on educational community based programs such as "Safe kids/ Healthy neighborhood coalition, in Central Harlem, New York City"; "Community based Handgun Safe Storage Campaign, King County, Washington" (9, 10).

The doctors who face the victims in emergency rooms must take an additional active role in formulating and maintaining new public health policies which aim to diminish the prevalence of gunshot injuries.

Conflict of Interest

No conflict of interest is declared by the authors.

References

1. Geary U M, Ritchie D A, Luke L C. Occult gunshot injury of the temporal bone. *J Accid Emerg Med* 1997; 14; 185-6.

2. Martins RS, Siqueira MG, Santos MT, Zanon-Collange N, Moraes OJ. Prognostic factors and treatment of penetrating gunshot wounds to the head. *Surg Neurol* 2003; 60: 98-104.
3. Rosenfeld J V. Gunshot injury to the head and spine. *Journal of Clinical Neuroscience* 2002; 9: 9-16.
4. Kim T-W, Lee J-K, Moon K-S, Kwak H-J, Joo S-P, Kim J-H, Kim S-H. Penetrating gunshot injuries to the brain. *J Trauma* 2007; 62; 1446-51.
5. Valadka A B, Gopinath S P, Mizutani Y, Chacko A G, Robertson C S. Similarities between civilian gunshot wounds to the head and nongunshot head injuries. *J Trauma* 2000; 48; 296-302.
6. Rothschild M A, Schneider V. Gunshot wound to the head with full recovery. *Int J legal Med* 2000;113; 349-51.
7. Amirjamshidi A, Abbassioun K, Rahmat H. Minimal debridement or simple wound closure as the only surgical treatment in war victims with low-velocity penetrating head injuries. *Surg Neurol* 2003; 60; 105-11.
8. Özkan Ü, Özateş M, Kemaloğlu S, Güzel A. Spontaneous migration of a bullet into the brain. *Clinical Neurology and Neurosurgery* 2006; 108; 573-5.
9. Sidman EA, Grossman DC, Koepsell TD, D'Ambrosio L, Britt J, Simpson ES, et al. Evaluation of a community-based handgun safe-storage campaign. *Pediatrics* 2005; 115: 654-61.
10. Davidson L L, Durkin M S, Kuhn L, O'Connor P, Barlow B, Heagarty M C. The impact of the safe kids/healthy neighborhoods injury prevention program in Harlem, 1988 through 1991. *Am J Public Health* 1994; 84; 580-6.