

An Air-Rifle pellet stuck into pericardium

Perikarda saplanmış havalı tüfek mermisi

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To the editor;

An 8-year-old girl admitted to hospital after being shot with an air powered gun by a tourist who was shooting the balloons on the sea. A 4.5 mm caliber pellet entered her body from a distance of 5 meters. After the incident she was fully conscious, hemodynamically stable with some pain at wound area. On examination, we detected a 5x5 mm entrance site of the pellet on the right anterior axillary line at the level of third interspace with no exit wound existed. Other findings was unremarkable except for decreased breathing sounds heard over the basal region of the right lung. Chest radiograms showed a pellet under the sternum in anterior mediastinal area (Figure 1). Two-dimensional echocardiography revealed normal systolic and valvular functions without pericardial effusion. A non-surgical management planned initially. But she underwent an emergent operation for pellet removal from anterior mediastinum because of new onset ventricular extrasystoles on the second day of the follow-up period. Two defects at median and inferior lobes of the right lung were fixed by primary sutures. During the operation we saw that the pellet was stuck into the pericardium of the right ventricle. After an explorative pericardiotomy, a small bruise at myocardium was observed without any pericardial effusion. Her subsequent course was uneventful and she was discharged on the postoperative 5th day.

Air rifle is a type of gun that fires projectiles by compressing air or other gas sources. First samples of these guns were developed in the 16th century. Owing to technological advances, muzzle velocities and rifle

ranges increased gradually. Currently the muzzle velocity of air guns can range from approximately 45 m/sec to 360 m/sec, similar to traditional firearm pistols. Air guns are used commonly for hunting, recreational shooting, and competitive sports worldwide. These guns are also used for balloon shooting, on the sea surface, as a trendy touristic activity in Turkey.

Both low-and high-velocity air rifles can cause serious injuries or even death, especially in children⁽¹⁾. Bratton et al.⁽²⁾ reported clinical courses of injured patients from three states of US with 30% fatality from intracranial injuries. Bhattacharyya et al.⁽³⁾ reported a case series of 42 non-powder gun injured children. Fifty percent of their cases had undergone surgical interventions and discharged from the hospital after an average of 7 days. Homicides and suicides related with air-gun usage have been also reported^(4,5). In United States 49% of the children in 5 to 14 years of age, mostly males, were reportedly had been victims of nonpowder gun injuries⁽⁶⁾.

Gunshot injuries occur by two mechanisms; the first one is crushing and laceration of the tissue through the passage of a projectile and the second is due to radial elastic deformation when the tissue stretches as rapidly moving and rotating projectile passes through it. Nonpowder firearm projectiles are so light and lose their velocity so quickly that the mechanism of injury is solely due to tissue destruction. It is reported that a velocity of 50 m/sec and 65 m/sec is enough to penetrate skin and bone, respectively. This injury may be harmful and fatal if the projectile hits vital organs like brain, heart, lungs and great vessels. Recently, DeCou et al.⁽⁷⁾ reported three

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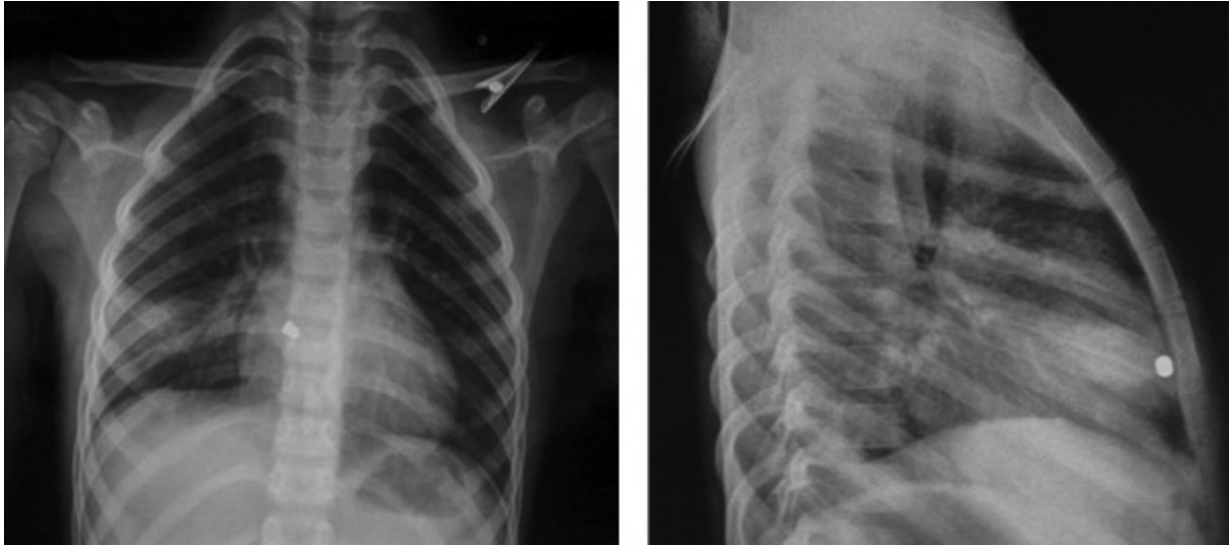


Figure 1. Anteroposterior and lateral chest radiographs with radiopaque pellet visualized in the anterior mediastinum.

boys with life-threatening air rifle injuries requiring surgical intervention. Surgical management of an intracardiac projectile may not be required if the heart cavity is intact⁽⁸⁾. However mortality on the 5th day of non-surgical follow up of a intracardiac projectile has been reported⁽⁹⁾.

Because of ensuing potentially serious injuries, air rifle wounds should be evaluated carefully. After the first stabilization (airway, breathing and circulation; ABCs) of the patient with an air rifle injury to heart, the presence of a potential pericardial tamponade, embolisation of the projectile, cardiac function and structural integrity should be assessed.

In this case we decided on a non-surgical follow up because of the stable vital signs and normal echocardiographic findings. However ventricular extrasystoles auscultated on the second day of follow up required a surgical intervention.

In some countries these guns have still been used as toys, and there is no legal sanction for carrying them. In Turkey there are no restrictions and no requirement for registration for selling or carrying air guns and gas compressed guns.

In conclusion air rifles are potentially lethal weapons, and they may cause serious injuries in children. An air rifle injury should be managed as carefully as a firearm injury. So they should not be considered as toys. Moreover, usage of these weapons should be controlled with laws.

REFERENCES

1. Scribano PV, Nance M, Reilly P, Sing RF, Selbst SM. Pediatric nonpowder firearm injuries: outcomes in an urban pediatric setting. *Pediatrics* 1997;100(4):E5. <http://dx.doi.org/10.1542/peds.100.4.e5> PMID:9310538
2. Bratton SL, Dowd MD, Brogan TV, Hegenbarth MA. Serious and fatal air gun injuries: more than meets the eye. *Pediatrics* 1997;100(4):609-12. <http://dx.doi.org/10.1542/peds.100.4.609> PMID:9310513
3. Bhattacharyya N, Bethel CA, Caniano DA, et al. The childhood air gun: serious injuries and surgical interventions. *Pediatr Emerg Care* 1998;14(3):188-90. <http://dx.doi.org/10.1097/00006565-199806000-00003> PMID:9655659
4. Aslan S, Uzkeser M, Katirci Y, et al. Air guns: toys or weapons? *Am J Forensic Med Pathol* 2006;27(3):260-2. <http://dx.doi.org/10.1097/01.paf.0000220919.45493.af> PMID:16936506
5. Bligh-Glover WZ. One-in-a-million shot: a homicidal thoracic air rifle wound, a case report, and a review of the literature. *Am J Forensic Med Pathol* 2012;33(1):98-101. <http://dx.doi.org/10.1097/PAF.0b013e318221b8a9> PMID:21860323
6. Laraqe D. Injury risk of nonpowder guns. *Pediatrics* 2004;114(5):1357-61. <http://dx.doi.org/10.1542/peds.2004-1799> PMID:15520121
7. DeCou JM, Abrams RS, Miller RS, Touloukian RJ, Gauderer MW. Life-threatening air rifle injuries to the heart in three boys. *J Pediatr Surg* 2000;35(5):785-7. <http://dx.doi.org/10.1053/jpsu.2000.6079> PMID:10813350
8. Klein JA, Nowak JE, Sutherell JS, Wheeler DS. Nonsurgical management of cardiac missiles. *Pediatr Emerg Care* 2010;26(1):36-8. <http://dx.doi.org/10.1097/PEC.0b013e3181c39a39> PMID:20065828
9. Fernandez LG, Radhakrishnan J, Gordon RT, et al. Thoracic BB injuries in pediatric patients. *The Journal of Trauma* 1995;38(3):384-9. <http://dx.doi.org/10.1097/00005373-199503000-00017> PMID:7897723