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Unexplained pellets in heart after shotgun wound through the hip: A case report

Kalçadan tüfekle vurulma sonrası kalpte açıklanamayan saçma taneleri: Olgu sunumu

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Abstract
The replacement of foreign materials in the human body is rare and the exact mechanism of migration has never been entirely explained. This case was found worth reporting because of the pellets found in the heart of a patient injured by a shotgun through the hip region. The patient was brought to the emergency service because of a hunting rifle injury. Examination revealed numerous entry holes in the gluteal region but there was no sign of injury in the chest or back. On radiographs, there were numerous pellets in the hip and thigh regions. Routine chest X-ray showed four pellets within the mediastinum, probably within the heart, so patient was followed up to prevent probable complications. It should be considered that unexpected complications may be encountered in shotgun injuries due to migration of pellets regardless of the region of injury.
Keywords: Shotgun wound, Pellet migration, Foreign body embolism, Chest X-ray

Öz
Yabancı maddelerin insan vücudu içinde yer değiştirmesi nadir görülen bir durum olup, göç mekanizması hiçbir zaman tam olarak açıklanamamıştır. Kalça bölgesinden av tüfeği ile yaralanan hastanın kalbinde dört adet saçma tanesine rastlanması nedeniyle bu olgu rapor edilmeye değer bulunmuştur. Av tüfeğiyle yaralanma tanısıyla acil servise getirilen hastanın muayenesinde; gluteal bölgede çok sayıda saçma giriş deliği olduğu, göğüs ve sırt bölgelerinde herhangi bir yaralanma izi olmadığı tespit edildi. Çekilen radyografilerde; kalça ve uyluk bölgelerinde çok sayıda saçma tanesi mevcuttu. Rutin olarak çekilen akciğer grafisinde mediastende kalbe uyan bölgede, dört adet saçma tanesi izlendi ve bu nedenle oluşabilecek komplikasyonlar açısından takip edildi. Özellikle saçma ile olan ateşli silah yaralanmalarında, yaralanma bölgesi fark etmeksizin saçma tanelerinin yer değiştirebileceği göz önüne alınarak beklenmedik komplikasyonlarla karşılaşılabileceği göz önüne alınmalıdır.
Anahtar kelimeler: Av tüfeği yaralanması, Saçma migrasyonu, Yabancı cisim embolisi, Akciğer filmi

Introduction

The migration of foreign bodies within the human body is a rare phenomenon. It has been reported that materials such as Kirshner or cerclage wire, which are frequently used in orthopedic surgeries, migrate to different regions from the areas where they are applied, such as the clavicle, patella or olecranon [1-7]. In some rare cases, bullets have been observed to migrate to different regions of the body following a gunshot injury [8-11]. The common feature of these cases is that the migration mechanism is never fully explained.

This case was found worthy of reporting due to four pellets which were displaced into the heart of the patient who had been injured by a shotgun from the gluteal region.

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Case presentation

A 36-year-old male patient was brought to the emergency room after a hunting rifle injury. During his examination, many open wounds, all posteriorly located and consistent with the entry wounds of the pellet, were seen in both hips and thighs (Figure 1). On the other hand, there were no signs of injury in the chest and back (Figure 2). It was found that the range of motion of the lower extremities of the patient was painful but complete and there was no neurovascular deficit.

On the radiographs, many radio-opacities, consistent with pellets, were observed in the hip and thigh regions. The patient was hospitalized for follow-up, before which a chest radiograph was obtained that showed four more pellets in the mediastinum in the heart-matching region (Figure 3). Computed tomography images confirmed that two of the pellets were attached to the pericardium and two of them adhered to the ventricular wall (Figure 4). Bedside echocardiography performed in the emergency department showed no pericardial fluid and no wall motion abnormality. Since there was no entry wound in the chest or back, it was concluded that the pellets detected on chest x-ray had migrated from the gluteal region into the mediastinum. Transthoracic echocardiography, performed after hospitalization, showed no pathology. It was confirmed via daily chest radiographs that the particles were not mobile. No surgical intervention was planned for the patient in the evaluation made by the Cardiovascular Surgery Clinic. On the fifth day of hospitalization, the patient was discharged with antibiotic treatment.

The patient was followed-up for one year by monthly checks within the first three months and then once every three months. Pelvic, thigh and chest radiographs were obtained at each follow-up. It was confirmed that the particles in the heart were not mobile. On the first year of follow-up, 3 of these particles were seen in the same location and 1 was minimally displaced in the ventricular wall. Because this replacement was not clinically important and the other pellets remained constant, no intervention was needed, and the patient was invited for control visits at one-year intervals. Patient's written consent and ethical approval were obtained (Decision No: E-18-1815).

Figure 1: Multiple open wounds were seen in both hip and thigh regions of the patient, all posteriorly located and compatible with the entry wounds of the rifle injury.

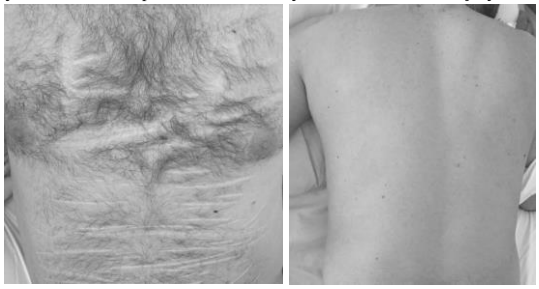

Figure 2: Patient had no injuries on his chest and back.

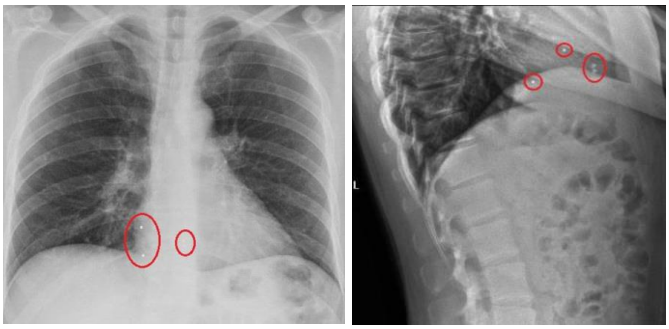

Figure 3: Hyperdense foreign bodies in the middle mediastinum on anteroposterior and lateral chest x-ray

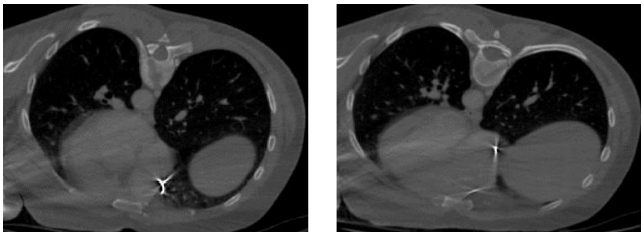

Figure 4: Hyperdense foreign bodies in the middle mediastinum on axial computed tomography images

Discussion

Foreign body migration, although not quite common in the literature, happens through different mechanisms and implants. Implanted materials such as pacemaker and shunts may reportedly migrate from their original locations to distant sites; however, the exact mechanism of such migration is not always clear. There are case reports in the literature of materials such as Kirschner and cerclage wire are migrating various regions to other locations in the body [12,13]. Although it is a relatively rare event, the migration of bullets or pellets into the heart has also been reported. When a pellet enters the soft tissue and loses its kinetic energy, it can either penetrate the tissue or remain inside. Richve et al. [14], who examined 7500 firearm injuries in the Vietnam War, encountered 22 patients with embolism of bullets. In 2001, two cases of gunshot injury from the upper extremity, one of which migrated to the heart and the other to a peripheral vein, were reported in Australia [15]. Although these migrations are explained with different theories, such as replacement of foreign bodies by blood flow after entering the vein, abdominal pressure change by coughing etc., or replacement via macrophage response caused by body defense mechanisms, the mechanism of the replacement has not yet been fully elucidated [3,5,13]. Because the mechanism of replacement is not clear, there is no possible way to know where the migrating bullet or pellet will migrate to in the human body.

Replacement of foreign bodies in the body, although a rare phenomenon, should always be kept in mind because of potential unexpected complications. Therefore, especially in firearm injuries, chest x-ray should be obtained routinely, considering that bullets or pellets can be replaced.

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