SINGULAR DOMESTIC INJURY BY ATYPICAL POINTED OBJECT

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Abstract

We present the unusual case of a woman who died by impalement of the left cervical region, caused by a peculiar harmful object (a bamboo cane) which penetrated as a result of an accidental fall. Necropsy findings ascertained that the atypical object had formed a dead end path, hence causing the divergence and laceration of the cervical and thoracic structures along its path, specifically the median portion of the aortic arch, and the front wall of the pericardial sac, resulting in death from hemorrhagic shock. The authors also briefly review the relevant literature on the subject.
Abstract

Viene illustrato un particolare caso di decesso di una donna da impalamento della regione cervicale sinistra, determinato da un peculiare mezzo lesivo (canna di bambù) penetrato in seguito a caduta accidentale. L’esame necroscopico consentiva di accertare che il mezzo puntuto atipico aveva creato un tramite a fondo cieco, comportando la divaricazione e dilacerazione delle strutture cervicali e toraciche incontrate lungo il suo percorso, nello specifico la porzione mediana dell’arco aortico e quindi la parete anteriore del sacco pericardico, con conseguente decesso per shock emorragico. Gli Autori ripercorrono, inoltre, brevemente la letteratura sull’argomento.

Introduction

Impalement was an ancient torture method introduced by the Tartars, which involved the body of the condemned person being pierced through by a wooden pole which was hoisted vertically and fixed in the ground. In order to facilitate stake insertion into the body of the condemned, the tip was smeared with oil or honey: the route of entry could be the anus, vagina or perineum, the output usually the mouth or the scapular region. The torture could last for several days before death if vital organs were not damaged.

This term is used in forensic pathology to describe penetrating injuries resulting from an atypical pointed object, of considerable size, entering the body and combining aspects of both sharp and significant contusive trauma with substantial tissue laceration and destruction.

Penetrating injuries can occur from various tools: poles, tree branches, fences, javelins, etc. (1). Hereinafter we report the case of a woman who died by impalement caused by an atypical pointed object (a bamboo cane) which, further to an accidental fall, penetrated the victim’s thorax through the left lateral cervical region.

Case Study

We present the case of a 73-year-old woman, used to exercising agricultural activities, and found dead in her vegetable garden. Upon discovery, the body was lying face down in close proximity of a green beans plantation where there were many bamboo poles, used to support the climbing plants, with a sharp and beveled edge, one of which was soaked with blood for about 15 cm, had a total length of 120 cm and a 2.5cm diameter (Figure 1).

On preliminary examination of the body, a perforation was observed in the left basicervical region. The skin appeared diffusely smeared with dried blood, most apparent on the face, the cervical region and upper limbs including the hands.

Autopsy

On external examination of the corpse, after a thorough cleaning of the body surface, a tissue perforation was pointed out in the left cervical region. The centre of the lesion was 139 cm. from the calcaneal plane, 3.4 cm. from the midline, 9.8 cm. from cutaneous projection of the mandibular symphysis, and 3 cm. from the top edge of the clavicle. This perforation, with the head slightly hyperextended, was shaped like a roughly oval loop (cm. 2.2 x 1.1), surrounded by an ecchymotic-excoriated peripheral rim most developed in the lower and left parts with a 0.6 cm maximum thickness (Figure 2).

The examination revealed a dead end path traversing the body with a top down, left to right and forwards to backwards direction.

The neck autopsy marked out a conspicuous blood infiltration at the left sub-hyoid muscles. Also, a small vegetal fragment, attributable to the atypical pointed object discovered upon finding of the corpse, was detected near the path.

The neurovascular bundle and the other anatomical structures adjacent to the skin lesion were intact.
Dissection of the thoracic cavity revealed the full-thickness perforation of the anterior wall of the pericardial sac and the aortic arch, which presented a central oblique laceration (Figure 3). For the sake of thoroughness, the examination of the remaining organs was devoid of noteworthy elements except for a general visceral paleness, compatible with a condition of hemorrhagic shock as well as the lack of hypostatic signs.

**Discussion**

Several studies on lesions of the lateral regions of neck and of head structures caused by impalement have been reported in literature. The event is mostly accidental and it can either occur when a pointed object penetrates the body or when the body impacts against a pointed object. The circumstances behind the event and its mechanisms can vary widely (2) and indeed it can occur during road accidents, at work, in sport or during leisure activities (3, 4, 5).

Multiple cases are reported in literature, some of which absolutely uncommon, in that the penetrating injuries involving the most diverse parts of the body are caused by many different objects such as a steel bar accidentally falling from scaffolding (6) or the gearshift lever of a car (7) or a road picket (8). Impalement injuries of the palate and oropharynx, due to falls during work activities carried out while holding an object in the mouth which that way turns into a lethal weapon, are not uncommonly reported (9, 10).

Furthermore, particular types of impalement have been described during sexual intercourse, involving the genitals and/or the anus (11, 12).

Homicidal events are very rare, indeed only two very peculiar case are reported in the literature: the first one refers to a teenager, whose skull was impaled by a metal railing thrown at him during a fight (13), and the second one refers to a man killed by an iron bar impaled at the submandibular region (14). Finally, even suicides carried out this way are very rare, because they mainly relate to falls from height, in which the subject throws himself/herself down onto a pointed object (15).

Impalement involving the cervical region does not always result in death, unless it is associated with laceration of the vascular structures or of vital organs. Indeed, the literature reports many cases of subjects who survived impalement of the lateral-cervical region (16, 17). Of particular interest is the case described by Kettelle and coll. (16) which describes an impalement caused by an accidental fall: the subject, while trying to prune the trees in his garden with a metallic handsaw, lost his balance and fell to the ground from the roof of the camper on which he was accomplishing the work; as a result of the fall, the metallic handsaw penetrated the right lateral cervical region exiting with an almost horizontal direction at the contralateral region; the immediate assistance and surgery allowed the survival of the man without any particularly serious sequelae.

In the case presented, the particular detrimental object (bamboo) - penetrated as a result of an accidental fall - albeit entering the body through the left cervical region, damaged major and vital thoracic structures. Indeed, necropsy findings ascertained that the atypical pointed object had formed a dead end path, hence causing the divergence and laceration of the cervical and thoracic structures along its path, specifically the median portion of the aortic arch, and the front wall of the pericardial sac, resulting in death from hemorrhagic shock.
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