

CASE REPORT

A missed diagnosis of the cervical spine fracture. An autopsy case report and literature review

Dilek Durak¹, Bülent Eren², Recep Fedakar¹, Nursel Türkmen¹

Uludag University Medical Faculty, Forensic Medicine Department, Görükle 16059, Bursa, Turkey.
bulenteren2000@yahoo.com

Abstract: We report an autopsy case of a 64-year-old man who was injured by a falling tree on his head, caused a cervical spine fracture and the injury was diagnosed by an autopsy. The goal of this study was to analyze the reasons for the missed diagnosis to provide recommendations for the optimal examination of patients with suspected cervical spine injuries (Fig. 1, Ref. 10). Full Text (Free, PDF) www.bmj.sk.
Key words: cervical spine fracture, missed diagnosis, forensic, autopsy.

Despite many advances in trauma care, a correct diagnosis of cervical spine injuries is still a common problem. In this case with an atypical trauma and cervical spine fracture, the injury was diagnosed by an autopsy. The goal of this study was to analyze the reasons for the missed diagnosis to provide recommendations for the optimal examination of patients with suspected cervical spine injuries

Case report

A 64-year-old man, who was injured while cutting down a tree (approximately 20 meters), which fell on his head, was taken to a local hospital. The fall of the tree was witnessed by the people present at the scene, who reported a direct blow to his head. The physical examination revealed unconsciousness and a head injury. He was intubated and transferred to our hospital. In this patient, the Glasgow Coma Scale (GCS) score was 3 and, the pupil's light responses were negative. The cranial computerized tomography (CT) was normal. The lateral x-ray view was normal until the level of the C6. After two days, the patient died. To clarify the exact cause of death, he was sent to the Council of Forensic Medicine. At the autopsy, the external examination of the body showed an abrasion on the knee and mentum, and a scalp laceration. In the internal observation, a diffuse haemorrhage (10 cm x 7 cm) in the pre-vertebral fascia associated with the laceration of the anterior longitudinal ligament underlying a complete right-left fracture through the vertebral body of C6 were found (Fig. 1). A spinal epidural haematoma was detected.

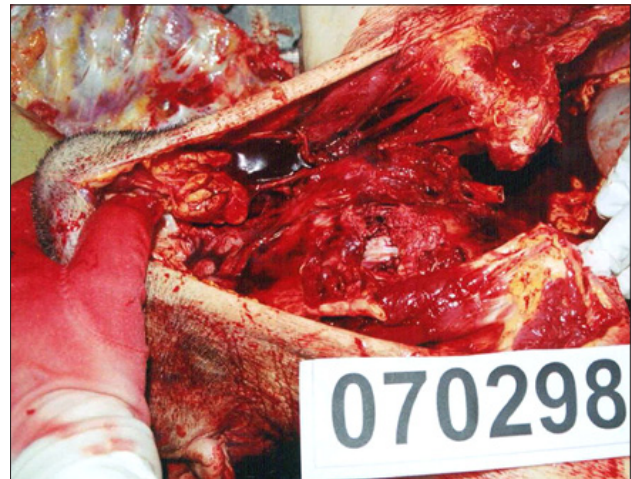


Fig. 1. Diffuse haemorrhage in the pre-vertebral fascia associated with the laceration of the anterior longitudinal ligament underlying a complete right-left fracture through the vertebral body of C6.

The macroscopic examination of the oesophagus showed sub-mucosal haematomas of 15 cm x 7 cm. Apart them, no changes were found regarding internal organs. The neuro-histopathological investigations confirmed the presence of the spinal epidural haematoma. Toxicological analysis of the blood revealed no alcohol, drugs, or medications. In this case, the spinal epidural haematoma with a lower cervical fracture was confirmed as the cause of death.

Discussion

Injuries of the cervical spine occur in 2.0 to 6.6 % of blunt trauma patients, with a co-existence of head injury increasing the incidence of cervical spine injury to 10 % (1–3). The same injury mechanism can carry a various risk of injury in different patients. The highest risk occurs in patients, who are more than

¹Uludag University Medical Faculty, Forensic Medicine Department, Görükle 16059, Bursa, Turkey, and ²Council of Forensic Medicine of Turkey Bursa Morgue Department

Address for correspondence: Bülent Eren, MD, Council of Forensic Medicine of Turkey Bursa Morgue Department, Heykel, Osmangazi 16010, Bursa, Turkey.
Phone: +90.224.2220347, Fax: +90.225.5170

50 years of age and the injury mechanism involves a high energy, unconsciousness, and the presence of scalp laceration (1). In our case, these risk factors were found. The early detection of cervical spine injuries is essential because a delayed or missed diagnosis might lead to tragic consequences for the patients. The incidence of delayed or missed diagnosis of the cervical spine has been reduced in the last years by an increased availability and accuracy of radiological examination (computed tomography scan, magnetic resonance imaging) as well as improved diagnostic algorithms at the trauma departments. Nevertheless, the incidence of delayed or missed diagnosis of the cervical spine injuries is between 5 and 20 % (4). Previous study has shown an incidence of the delayed diagnosis of 4.9 % and three main reasons for delayed or missed diagnosis of the cervical spine: lack of experience in the evaluation of the radiographs leading to misinterpretation, inadequate radiographs, and incomplete sets of radiographs (4). In our case, the cervical spine fracture was missed because only a lateral view was made during the initial examination in the trauma room and the x-ray field did not show the level of the injury. In our opinion, this problem mainly appears in patients with GCS score 3 where life-saving measures initially dominate. Today, the optimal standard method of the cervical spine screening is a conventional radiographic series, which consists of lateral, anteroposterior, and odontoid views (1–5). Plain x-rays are useful in detecting and describing lower cervical injuries but the rate of missed injuries has varied from 10 %–48 % (1). The concept presented by previous researchers, that plain cervical spine radiographs are not a sensitive screening test for the cervical spine fractures, is clear and spiral CT is commonly required (3, 5–8). Sanchez et al, demonstrated that the spiral CT scanning of the cervical spine as an initial test had a sensitivity of 99 % and a specificity of 100 % (5). Magnetic resonance imaging (MRI) has an established role in the evaluation of suspected spinal cord injuries; the role of MRI in cervical spine clearance protocols for hebetudinous or comatose trauma patients is debated (2).

Clinical records showed several mechanisms of the cervical spine injuries. Platzer et al, for example, stated that injuries resulting from car or motorcycle accidents account for 44 %, falls for 22 %, jumps into shallow water for 15 %, various sports activities for 8 %, scuffles for 1 %, and other mechanisms for 9 % of cases (4). In our case, an atypical trauma was found. To our knowledge, there has been no similar published case report in the medical literature. Lower cervical spine fractures are common injuries following a blunt trauma. Fractures of C6 and C7 account for nearly 40 percent of the cervical spine injuries after

the blunt trauma (1, 9, 10). Hyperextension trauma can lead to tensile failure of the anterior longitudinal ligament, compression across the facet joints, and extension-type teardrop fractures (1). We demonstrated the laceration of the anterior longitudinal ligament and a complete right-left fracture through the vertebral body of C6. This classification is not listed among the well-known stages.

Conclusions

We described an autopsy case report with an atypical trauma and a lower cervical fracture. We hope that this autopsy case report with the cervical spine fracture will contribute to the evaluation, mechanics, diagnosis, classification and management.

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