



Pathology Biology Section – 2009

G20 Ankylosing Spondylitis in Traumatic Death: A Case Report

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After attending this presentation, attendees will have a better understanding of the possible impact of pre-existing structural skeletal disease in traumatic death, illustrated by a case report.

This presentation will impact the forensic community by reminding it of the importance of taking all natural disease into account when investigating deaths, even those diseases not normally considered fatal. Furthermore, it will present the possibilities of advanced radiological imaging as a facilitator in death investigation in the evaluation of the mechanism and manner of death.

Ankylosing spondylitis is a rheumatic disease which is associated with tissue type HLA-B27 and is considered non-fatal. Main structural features in severely affected individuals are osseous fusion of the sacroiliac joints, and rigidity of the spinal column caused by bone bridging between vertebral bodies (syndesmophyte formation). Due to this rigidity there is an increased risk of spinal fractures, especially cervical fractures, even from low energy trauma.

A middle-aged man rode his bike home from a bar while intoxicated. A witness saw him swaying and at low speed riding the bike into a curbstone. During the crash he went over the handlebars and collided with the pavement face first. His breathing ceased immediately, soon followed by cardiac arrest. Resuscitation efforts at the scene were unsuccessful. Due to the rapidity of the cardiac arrest, the attending emergency physician ruled that it was a natural death caused by a cardiovascular event secondary to the fall from the bike. According to the antemortem information obtained from the police report and the general practitioner, the deceased was healthy without prior cardiovascular disease. Postmortem computed tomography scanning revealed multiple fractures of the spine, including a fracture of the odontoid process of C2, disco-vertebral avulsion through C3-C4, and Th10-Th11. Associated with the upper cervical fractures there was displacement of fragments into the spinal canal affecting the spinal cord. Furthermore, there were ankylosing changes of the anterior longitudinal ligament throughout the spinal column with extensive syndesmophyte formation bilaterally, also known as bamboo spine configuration, particularly in the lumbar spine. The sacroiliac joints were closed by osseous fusion. All the radiological findings were in agreement with the diagnosis of ankylosing spondylitis. The medicolegal autopsy showed abrasions in the face, on the back, on hands, and legs; bleeding in and around the spinal fractures; rib fractures with sparse bleeding; bone bridging of the intervertebral joints; an enlarged heart, insignificant atherosclerosis; a fatty liver, and an enlarged spleen. Blood alcohol was 189 mg/dl. The microscopical examination revealed hypoxic changes in the brain, granuloma formation in the lungs consistent with sarcoidosis, and bone marrow emboli in the pulmonary arteries. The bone marrow emboli were thought to come from the primary spinal fractures or the secondary rib fractures caused by the resuscitation efforts.

Further investigation into the medical history, by requesting relevant hospital records, revealed that the deceased had received treatment in an outpatient clinic nine years prior, due to ankylosing spondylitis with rigidity of the spine. He had furthermore been under evaluation for lung sarcoidosis. The cause of death was ruled to be upper cervical spinal cord injury due to upper cervical spine fractures, complicated by spinal rigidity secondary to ankylosing spondylitis. The manner of death was ruled to be accidental.

This case report illustrates the fatal outcome of spinal injuries in an individual who suffered from a structural skeletal disease, where the ankylosing spondylitic changes acted as predisposing factors leading to his death. Thus, knowledge of pre-existing skeletal disease is important in the medicolegal evaluation, as diseases that are considered non-fatal can contribute to the cause of death. In this case report the understanding of the conditions leading to death was recognized and supported by the postmortem computed tomography.

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Ankylosing Spondylitis, Postmortem Examination, Forensic Imaging