Passenger Spinal Injuries in the 2013 Asiana and 2009 Turkish Airlines Crashes

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This presentation describes injuries resulting from two survivable airline crashes. Both airplanes were equipped with 16 G dynamically certified passenger seats, and passengers in both suffered complex spinal injuries. In 2009, Turkish Airlines flight 1951, a Boeing 737-800, crashed in a plowed field short of the Amsterdam Schiphol Airport. During the crash sequence, the aircraft impacted a field tail low, slid along the ground, and broke into three parts. As a result of the crash, nine passengers died, 120 were injured, and 6 passengers were uninjured. On July 6, 2014, Asiana Airlines flight 214, a Boeing 777-200ER, crash landed at San Francisco International Airport with 307 people on board, including 16 crew members. During the crash sequence, the tail impacted the sea wall and tore off. The airplane slid along the tarmac and then the aft portion of the plane became airborne again while the nose remained on the ground. The airplane turned approximately 330 degrees before coming to rest on the ground. Among the 291 passengers on the flight, three died and 174 were injured. In both crashes, detailed injury descriptions were conducted including injury coding using the Abbreviated Injury Scale (AIS) codes and Injury Severity Scores (ISS), when adequate medical records were available. Because of the unique opportunity to analyze injury patterns in these two crashes, a comparison between the spinal injuries in each crash was conducted. In the Turkish Airlines crash, 23 injured passengers sustained 27 spinal injuries, including 4 cervical spine injuries, 8 thoracic spine injuries, and 15 lumbar spine injuries. Two passengers had thoracic spinal cord contusions with transient neurologic symptoms. In the Asiana Airlines crash, spinal injuries were diagnosed in 54 of the injured passengers. When muscular strains of the cervical, thoracic, or lumbar spine were excluded, 23 passengers had a total of 68 significant spinal injuries, including 12 cervical spine fractures, 43 thoracic spine fractures, 9 lumbar spine fractures, and 4 multilevel ligamentous injuries. None had spinal cord injuries. Patterns of spinal injuries and associated aggregate data is compared and contrasted between the two crashes.