## H57 Gunshot Wounds and Other Perimortem Trauma to the Sub-Adult Skeleton

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The goal of this presentation is to expose the forensic community to several specific examples of gunshot and blunt force trauma to sub-adult skeletons recovered from mass burials.

The information in this poster has been collected from investigations of killings from Guatemala, Central America, dating to the early 1980s. The seven case studies provide examples of the effects of gunshot wounds and blunt force trauma to the skeletal remains of individuals aged between two months and 16 years. One case in particular shows the erosion damage resulting from over 20 years of burial and the difficulty in determining the cause and manner of the trauma. In other cases preservation is much more complete and erosion plays a less drastic role in the analysis process.

All seven of the following cases provide the age and sex (if known) and details of the perimortem trauma observed. The samples were taken from skeletonised remains exhumed by the Foundacion de Antropologia Forense de Guatemala (FAFG) from 20 year old mass graves during 2001 and 2002. The individuals were all buried a short time after a violent death resulting from the conflicts in Guatemala between 1981-1982. In several cases relatives have identified the remains based on clothing and grave goods, these identifications are often confirmed with results of laboratory analysis where biological sex and age are determined through osteological analysis.

Case 1: a gunshot wound was identified in the cranium of a probable female aged 2-6 months. The entry appears as a circular orifice 6mm in diameter with internal beveling located in the left parietal. Radiating fractures affect the frontal, parietals, right temporal and sphenoid. The exit hole is not observable due to loss of bone tissue. Radiographs show no evidence of radiopaques, no ballistics were recovered either in the field or in the laboratory.

Case 2: the vertebrae and ribs of a probable female aged 7-9 years display trauma compatible with a gunshot wound to the abdominal region. Two right ribs (#9 and #11) exhibit complete fractures and plastic deformation; and six vertebrae (D11-L4) have comminute fractures, plastic deformation and loss of bone tissue. The left ulna has multiple fractures. The radiographs of vertebrae show evidence of radiopaques and fragments of projectile were recovered during excavation associated with lumbar vertebrae. A projectile was recovered in the laboratory from the clothing and a metal fragment with green oxidation was recovered in the area of the right scapula.

Case 3: the mandible of this probable male aged 8-12 years has undergone blunt force trauma (probably secondary to a gunshot wound to the cranium). The cranium (not displayed) also had multiple fracturing; however, erosion and loss of bone tissue prevents identification of the cause of trauma. The radiographs of thorax *en bloque* shows evidence of radiopaques. Metal fragments and a projectile were recovered from the thorax region during excavation. A projectile was recovered from the thorax in the laboratory.

Case 4: the cranium of this female aged 14-16 years, shows trauma to the cranium affecting the parietals and occipital. It is probable that blunt force trauma caused these fractures. Radiographs show no evidence of radiopaques, no ballistics were recovered either in the field or in the laboratory.

Case 5: the cause of the trauma as well as the sex of this individual aged 5-7 years is not determined. The cranium has simple fractures in the right parietal and occipital. Plastic deformation and loss of bone tissue as well as erosion prevents more accurate descriptions. Radiographs show no evidence of radiopaques, no ballistics were recovered either in the field or in the laboratory.

Case 6: this male aged 12-13 years suffered three gunshot wounds. The first in the proximal third of the right femur has an entrance wound 6x7.3mm on the anterior-lateral surface, and an exit hole measuring 6x8mm with beveling 34x17mm on the posterior and medial surface. The left femur has two gunshot wounds in the distal third of the diaphysis. The entrance, on the posterior and medial surface, measures 12x12mm, five fractures radiate from this, there is no evident exit hole. The second entrance hole is on the anterior and medial surface, below the first, and measures 9x9mm, two fractures radiate from this and are interrupted by fractures radiating from the first entrance hole, the is no evident exit hole. The radiographs of the femurs show evidence of radiopaques, ballistics were recovered during excavation from the femora, and in the laboratory ballistics were recovered from the trousers.

Case 7: the cranium and thorax of this probable female aged between 13-16 years suffered gunshot wounds and fractures secondary to these. In the skull there is extensive loss of bone tissue in the right frontal, parietal, and sphenoid, and polifragmentation of the left temporal and parietal featuring multiple radiating and concentric fractures as well as several diastastic fractures (parieto-frontal, parieto-termporal, tempero-occipital, and tempero-zygomatic). Thoracic vertebrae #3, 4 and 7 have complete and infraccion fractures in the arc and body compatible with firearm damage which also caused the damage to the right 4$^{th}$ rib and the left 6th and 7th ribs. Lumbar vertebrae #2-3 suffered blunt force trauma. The radiographs show evidence of radiopaques and ballistics were recovered during the excavation phase.

These seven cases are a preliminary demonstration of the damage caused by firearms and other weapons to the sub-adult skeleton. This sample is by no means representative of all the cases seen by

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anthropologists at the FAFG, instead, these cases were chosen to provide a variety examples with differing variables such as trauma location, trauma type, taphonomic effects and age that effect the analysis of trauma to the skeleton.

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