



### A158 The Characterization of Peri-Mortem Trauma on World War II (WWII) German Pilots

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**Learning Overview:** The goal of this presentation is to better understand peri-mortem trauma linked to aircraft crashes during WWII and the consequences of taphonomic damage linked to pilot equipment and coffins.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by demonstrating peri-mortem trauma within a specific group: WWII pilots. This study helps improve knowledge on skeletal analyses in military contexts and identify a common pattern of trauma.

During WWII in France, temporary burials were established for soldiers while the national military cemetery was being built. In 2018, a temporary cemetery was discovered in Beauvais (Oise, France) during land-use planning work. This area was near the German military airfield used from June 1940 to August 1944. The cemetery was excavated, and 39 coffins were uncovered. At the end of WWII, all the soldiers should have been transferred to the national military cemetery, but some of these were not.

Among these 39 coffins, 23 contained skeletal remains (ranging from a single fragment to several bones), and 16 presented complete individuals. These soldiers were bomber aviators and most of them were buried in their parachute. According to historical records, they fell and died between 1940 and the summer of 1942. Anthropological analyses of each individual included the biological profile and the analysis of pathological and traumatic conditions macroscopic observations.

Among the 16 complete individuals, 7 are well preserved and yielded a complete biological profile. Nine individuals are poorly preserved, and their biological profile was incomplete (most of the time, stature could not be estimated). Postmortem damage (taphonomic alterations) could have been caused by the sediment, the coffin, and/or the military equipment. Fifty-six percent of individuals were wrapped in their parachute and their cortical bone was severely damaged.

Peri-mortem trauma was observed in 14 soldiers (87.5%). Five (31%) had been autopsied and buried without military clothes or equipment. Blunt force peri-mortem trauma was the only type of trauma observed. The most-to-least impacted regions were the lower limb (60%), followed by the skull (56%), the upper limb (35%), the pelvic girdle (25%) and the spine (19%). The thorax was poorly preserved, and it was too difficult to differentiate between peri- and postmortem damage.

Among the types of fractures observed, butterfly, spiral, and segmental fractures were the most recorded on long bones. On the skull, linear fractures were very frequent, but the edges were smooth in several cases, due to subsequent taphonomic damage.

Twenty-three other coffins revealed some bones (from one to several) and almost all coffins with several bones revealed at least one case of blunt force trauma (i.e., one fragment of a butterfly fracture on the femur).

The fracture pattern was very similar in all individuals and is compatible with an air crash combined with a fall from a significant height. Even if that could be contradictory, it is rare to know the exact cause of death of soldiers during WWI and WWII.

This study presents rare cases of bomber aviators buried in the same place who share the same cause of death. In the future, we could compare these results with other soldiers who died during armed conflicts, especially aviators. This study intends to provide a comparative framework for differential diagnosis and possible axes for future research.

#### Forensic Anthropology, World War II, Blunt Force Trauma