



### A142 An Analysis of Skeletal Demographics and Traumatic Injuries From the Khmer Rouge Period in Cambodia

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**Learning Overview:** After attending this presentation, attendees will be acquainted with the osteological analyses that were undertaken at the Khmer Rouge-period mass graves of Choeng Ek in Phnom Penh, Cambodia. This presentation will focus on a sample of crania from the more than 7,000 human remains housed within a memorial stupa (Buddhist shrine) at the site.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing scientific data regarding the demographics and traumatic injuries of the victims of mass violence in Cambodia. While much is known about the Khmer Rouge period from survivors and sociopolitical narratives, until recently, the disinterred human remains had not been scientifically analyzed on a large scale. The crania at Choeng Ek were assessed for demographic characteristics and traumatic injuries to discern whether execution methods were systematic between sex and age groups. The results provide valuable scientific and historical data, although there are limitations.

The Khmer Rouge regime-controlled Cambodia from 1975 to 1979. Conditions were severe and millions perished from overwork, poor health, and violence. Hundreds of thousands were executed and buried in mass graves throughout the country, and many of these graves were exhumed in the 1980s. One such gravesite is the Choeng Ek Genocidal Center (Choeng Ek) in the capitol city of Phnom Penh. Choeng Ek was used by the Khmer Rouge between 1977 and 1979 as the execution and burial location for one of its highest-level detention centers: S-21 or Tuol Sleng. After the overthrow of the Khmer Rouge, 86 of the estimated 129 mass graves discovered at Choeng Ek were exhumed. Although the exact number of individuals buried at Choeng Ek may never be known, today the remains of approximately 7,700 victims are curated within the stupa. This presentation will discuss the osteological analysis of more than 500 crania at Choeng Ek.

The crania were evaluated to determine demographic characteristics and traumatic injury patterns. For each cranium, the following data were assessed and recorded: date of analysis, identification number, sex, ancestry, age at death, traumatic injuries, and any pathologies or anomalies. Sex and ancestry were evaluated using morphoscopic characteristics and age at death was evaluated using cranial suture closure, specifically the maxillary sutures. Regarding the skeletal injuries, antemortem, peri-mortem, and postmortem trauma or damage was recorded. If traumatic injuries were present, the following information was documented: location (i.e., specific cranial bone(s)), timing, mechanism (i.e., blunt, sharp, high-velocity projectile/gunshot wound, or indeterminate), type of fracture (i.e., depressed, (linear) radiating, concentric, or other), whether the injury represented a direct impact, and the cranial region affected. All 508 crania were photographed, and some were radiographed.

Results indicate that the majority of the 508 crania were estimated to be male (82.9%) and young adults (68.3%) between the ages of 20 and 35 years old. When ancestry could be assessed, all the individuals were Asian. Therefore, the majority of individuals analyzed were young adult males of Asian ancestry. Peri-mortem trauma was present on 311 crania (61%), with 179 (58%) having discernable impact locations. Blunt force injuries (87%) were the most common mechanism of trauma and the basicranium (53%) was the most frequently impacted region. When the mechanism and location of traumatic injuries were evaluated by sex and age-at-death categories, no statistically significant differences were found, indicating that all victims with peri-mortem trauma were subjected to similar execution methods, regardless of their age or sex.

The available skeletal trauma results are consistent with the historical accounts of how the Khmer Rouge executed individuals at Choeng Ek. According to eyewitness accounts, Khmer Rouge victims were generally executed by being struck on the head or base of the neck (i.e., the basicranium) with a hard object (i.e., blunt force trauma). Thus, the results of this research suggest that the demographics and traumatic injuries of the Choeng Ek crania complement the historical narrative of the Khmer Rouge period. Ultimately, these remains stand as a testament to the violence that transpired as well as a solemn memorial to those who perished. The analysis of human skeletal remains is imperative for the construction of a more comprehensive understanding of the Khmer Rouge period in Cambodia.

#### Skeletal Trauma, Khmer Rouge, Cambodia