A121 Challenges in Identifying United States Casualties From Past Conflicts: An Assessment of Lines of Evidence

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After attending this presentation, attendees will better understand the process of effecting individual identifications of United States service members associated with past conflicts (World War II, Korea, and Vietnam) and recovered by various methods (disinterment, field recovery, unilateral turnover, and a commingled turnover sample) using data from the Defense POW/MIA Accounting Agency (DPAA).

This presentation will impact the forensic science community by highlighting the importance of antemortem records, quality of evidence, and necessity of multiple lines of evidence to effect individual identifications. Differences in the number and/or quality of lines of evidence per identification are evaluated based on conflict and recovery type.

All identifications are guided by historical research and investigations; however, this is not included as a line of evidence in this study. Instead, this study emphasized the five lines of evidence that are analyzed or interpreted in the laboratory. DNA, dental (FOR), and chest radiograph (CXR) comparisons are used for individual identification purposes, as these analyses involve the comparison of skeletal remains against antemortem data. Identifications are supported by anthropological skeletal analyses (FAR), which are completed "in the blind," and analyses of material items (MER), which associate remains with an individual or a conflict.

Ideally, every line of evidence would be at the analysts' disposal; however, due to the effects of time and other taphonomic processes, evidence may be impacted or limited. For example, disinterments generally consist of more complete sets of remains that could not be identified in the past, while field recoveries often consist of incomplete or fragmented remains. Complicating matters, the disinterred remains of many unidentified service members were coated in a formaldehyde powder prior to burial, which presents challenges for DNA analysis. The type of DNA analysis depends on available Family Reference Samples, which may be limited or unavailable despite searches for appropriate relatives. Additionally, antemortem records may be lacking or of poor quality.

This study includes data from 166 recent identifications made by DPAA. Once evidence is received by the laboratory, analyses are completed based on the condition of the evidence. On average, identifications are supported by three different analyses. Only one case was identified with a single analysis, while eight cases were identified with all five types of analyses. Overall, DNA contributed to identification in 70% of the cases, followed by FOR (68%), then CXR (33%). FARs were completed in 98%, and MER in 42% of identified cases. FARs are critical because an "in-the-blind" analysis of skeletal remains provides an unbiased means of supporting other analyses; however, the level of detail possible in any analysis depends on the condition of the remains. Therefore, any analysis may indicate positive association or inability or exclude association with a historical candidate.

When assessed by conflict (World War II, n=67; Korea, n=87; Vietnam, n=12), DNA analyses contribute less to older cases (Vietnam, 83%, vs World War II, 58%); however, FORs corroborate more older cases (Vietnam, 25%, vs. World War II, 88%). CXRs predominantly support Korea cases (42%), which can be explained by the relative absence of antemortem radiographs for other conflicts.

Analyses are also affected by recovery type (disinterment, n=45; field, n=60; turnover, n=11, and turnover/commingled, n=50). Only World War II and Korea cases are represented by disinterments. Less than half of disinterments have DNA results (40%), while DNA is present in at least 65% of other cases. More than 80% of disinterments and field recoveries have FORs, compared to less than 45% of other cases. DNA is most integral for resolution of commingled cases (100%), while material evidence is most commonly used to support identifications from field recoveries (83%, compared to less than 36% of other cases), where identifying media helps confirm loss locations and direct site excavations.

Each case is unique regarding types and conditions of evidence and available records. The elapsed time since the conflict does not appear to limit identifications. Differences exist based on conflict and type of recovery method, which can be explained by antemortem record availability, postmortem processing, and other taphonomic processes. Often records, materials, and/or the remains are incomplete or fragmented, which emphasizes the inadequacy of a single line of evidence.

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