H59 Is Carpal Tunnel Syndrome Detectable in the Skeleton?

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After attending this presentation, attendees will understand how carpal tunnel syndrome manifests in the skeleton and how this can be used in building the biological profile.

This presentation will impact the forensic science community by providing forensic anthropologists with knowledge as to how carpal tunnel syndrome presents in skeletons and how this is related to obesity, which has the potential to increase the precision and accuracy of observations during forensic assessments.

Skeletal pathology accompanies obesity, including Diffuse Idiopathic Skeletal Hyperostosis (DISH) and Osteoarthritis (OA). In order to define a signature of obesity in the skeleton, it is important to assess how other pathological conditions may manifest in the skeleton and combine this knowledge with that of the frequency of DISH and OA. Carpal Tunnel Syndrome (CTS), which affects the hand, wrist, and forearm, has been linked with obesity in the clinical literature. Treatment of CTS includes changing the hand, wrist, and forearm movements of CTS patients and/or surgery to increase the size of the carpal tunnel to accommodate the median nerve. The changes to muscle movements (increasing/decreasing) should lead differential expressions of Musculoskeletal Stress Markers (MSM), or entheses, in the hand, wrist, and forearm.

In order to test the hypothesis that entheseal expression is modified in CTS patients, donors with documented CTS in the W. M. Bass Donated Skeletal Collection were examined. These individuals had body masses ranging from normal to obese. MSM development in the hand, wrist, and forearm for muscles involved in flexion/extension and supination/pronation (the movements modified in CTS patients) were assessed in each skeleton. However, muscular development for the wrist and hand muscles were negligible, and thus dropped from the study. No differences in muscular expression among CTS and non-CTS patients were evident using a chi-square test. This is not surprising, as MSM have come under recent scrutiny for their inability to accurately distinguish between activity levels and body weight. Interestingly, while recording entheses for markers of rusticity and stress, the presence of OA in the hand and wrist areas was noted in 66.7% of the CTS patients.

In summary, detecting CTS in the skeleton is not straightforward and cannot be detected by muscular development via entheses. Further, a relationship between CTS and OA in the hand and wrist may exist, warranting additional exploration. However, this relationship is not strong enough to be diagnostic of CTS, alone. Thus, the forensic practitioner should consider looking for the suite of pathological conditions associated with obesity during the construction of a biological profile, especially if attempting to assess body mass from skeletal remains. If a suite of detectable conditions and/or diseases associated with obesity are present and considered in conjunction with other skeletal characteristics, the unknown individual may be obese. Also, the findings of OA in the hand/wrist of CTS patients may help to understand the etiology behind localized or isolated hand/wrist OA.

Identification, Biological Profile, Obesity

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