## H63    Pathologist Consensus in the Interpretation of Patterned Injuries From Photographs:  Reasons for Lack of Consensus

*William R. Oliver, MD\*, East Carolina University, Brody School of Medicine, Brody Medical Sciences Bldg, Greenville, NC 27834*

After attending this presentation, attendees will have a greater understanding of the cognitive basis for disagreements in pathologist interpretation of patterned injuries of the skin from photographs.

This presentation will impact the forensic science community by providing an explanation of the cognitive and practical issues surrounding the diagnosis of patterned injuries of the skin.  In particular, this presentation will address real versus apparent discordance in interpretation.

This presentation represents the second of three surveys supported by the National Institute of Justice examining how forensic pathologists interpret photographs of patterned injuries of the skin.  The project was originally proposed as a method of studying the effects of image processing on the diagnoses of patterned injuries of the skin from photographs.  It was to consist of three surveys.  The first survey was to be of "classic" patterned injuries to establish a baseline of high confidence and consensus.  The second survey was to be of degraded images to study the effects of degradation on that consensus.  The third survey was to add image processing, specifically contrast enhancement, to the images and see if this affected diagnosis in the same way similar studies did for radiology diagnosis.

However, the results of the first study were a complete surprise.  Rather than a consistent high consensus and confidence, there was a wide variation of both, with consensus ranging from a high in the mid-90% to a low in the upper-20%.  This was counter to the assumption that all but a few images should have been trivial to diagnose for all pathologists.

The principal findings of the first survey were presented at the 2015 American Academy of Forensic Sciences Annual Scientific Meeting.[1]  The diagnoses were requested in "tiers" going from general (e.g., "blunt vs. sharp injury") to moderate (e.g., "abrasion vs. contusion") to specific (e.g., "baton vs. hammer").  The hypothesis was that there would be more consensus at the more general tiers and less consensus at the more specific.  This was not the case — there was lower consensus at the middle tier and no significant difference between the most specific and most general.  A second finding was that there was an extraordinarily high correlation between confidence and consensus when all pathologists' answers were considered in aggregate, but the correlation was low at the individual pathologist level.  A number of demographic features correlated with choosing the consensus diagnosis, with the most important predictor being actively performing autopsies.

Modification of the second survey occurred to investigate these intriguing findings rather than look at degraded images.  Those who had responded to the first survey were asked to review their answers and indicate why they had different responses or low certainty.  These results are still being analyzed but the initial findings are also fascinating.  The most common reasons for lack of consensus were: (1) that the injuries were not specific and required history for determination; (2) differences in nomenclature (e.g., "I meant the same thing, but I use a different term"); (3) the presence of multiple injuries; and, (4) difficulty in taking the exam (e.g., "I pushed the wrong button" — most common with the confidence slider).  While image quality was asked about and played a part, it was a minor issue.

The problem of multiple injuries is most common with blunt trauma.  It is the case that with blunt trauma, injuries are rarely of one type — there are bruises and abrasions, or abraded lacerations, etc.  The question regarding which injury was the "primary" or "dominant" injury was asked, but many of the respondents simply refused to make that distinction.

Of greater interest was the reliance on history.  In the most specific tier of questions, development of the questions occurred so as to have one clearly obvious true result and others that were (potentially) much more unlikely (though not necessarily impossible), with participants being asked which was most likely.  The respondents often commented that there were possibilities that were not in the list and the only way to tell the difference was with history or other information.  Some commenters noted that they had been trained to decline to make diagnoses in the absence of history and felt that making such a diagnosis given just a photograph was malpractice.

The statistics of these findings will be presented as well as a discussion of the sources of disagreement.

**Reference(s):**

1.  Oliver W.R., Fang X.  Forensic Pathologist Consensus in the Interpretation of Photographs of Patterned Injuries of the Skin.  *J Forens Sci.* submitted for publication.

**Forensic Image Analysis, Patterned Injuries of the Skin, Forensic Pathology Diagnosis**

*Presenting Author