G52 Documenting Patterns of Injury in Fire Victims

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The goals of this presentation are to review 1) problems associated with documenting burned human remains, 2) recording patterns from fire trauma, 3) identifying features that may indicate body position and fire dynamics, and 4) suggestions for charting victims of mass disaster fatalities.

Dynamic burning processes affecting a human body produce one of the most complex alterations of form by distortion into the pugilistic posture. Additionally, further obfuscation occurs from superficial thermal changes to skin (charring, blistering, and splitting) and as damage progresses, exposure and destruction to deeper layers of subcutaneous tissue, musculature, viscera, and bones. Adequate records and documentation of burning changes are vital since it is known that the sequence of tissue changes correlates with heat source, origin, and body position especially if the expected pugilistic posture is not attained. The ability to use pathological examination of the body in this manner allows results to be integrated with independent investigation by anthropologists, fire marshals, and arson investigators. In such instances mere dictation of the findings fail to capture all the salient features and would otherwise be long and cumbersome. Borrowing on the ancient wisdom of a picture is worth a thousand words, a graphic presentation seems to be in order; however, accomplishing that in a constructive way is challenging.

One of the most difficult tasks in forensics is the ability to produce records for public consumption that are also useful as a court document and effectively convey the necessary information to communicate the same concepts understood by the examiner. Even more difficult is documentation limited by two-dimensional representation of a complex threedimensional process. The emphasis on mass disaster preparedness compels experts to improve the entire process for all types of fatalities but this seems more so in the burn victim. These fatalities are virtually always out of the anatomical position, and usually have various layers of tissues or organs exposed. Photographs are very useful but hardly fit for public release and if overly graphic, may even be considered too inflammatory in the autopsy protocol and render it unsuitable for jury use unless redacted.

At the University of Tennessee, Memphis physicians have undertaken several methods to achieve a permanent record of observations that retains a continuity of interpretation readily discernable after the passage of time and serves as an effective basis of communication to investigators and juries alike. Taking advantage of this active research in the burning process the authors are now sufficiently aware of the expected sequence of the changes to the body to identify what parameters are more useful to record. The manner in which they are recorded may vary with the case and several examples are presented.

With the advent of the digital age it is possible to take photographs of any sort and convert them into digital images (if not so originally) and digitally redact them to the point of abstraction with a subsequent loss of inflammatory content. Although this has not been subject to challenges in court, the digital images are not tendered as evidence so much as an aid to testimony. It is also important to be able to describe the process by which the redaction occurred. Most often the techniques used are to eliminate the color aspect and present the photo in grayscale (black and white) followed by use of computer filters to portray the edges of the image. At times retaining the color scheme does enhance clarity and is retained. It is then helpful to graphically add text to point out the various landmarks and interpret the image so orientation and understanding are not lost.

Another method goes back to the time honored process of diagramming various views of the body using charts depicting the skeleton outlined by the body contour. In this fashion changes in the skin, soft tissue, and skeletal elements are charted together, merging the pathology and anthropology findings into the same document. Charts depict the body in anatomic position since this is a reference standard, and allows for notation of any deviation from the expected pugilistic posture. Using either different colors or textured fills can document the stages of soft tissue changes. Once recorded, a comparison with diagrams depicting the expected pugilistic posture, patterns of soft tissue loss, exposure, and direction of skeletal exposure can be easily accomplished. This creates a permanent visual record to be utilized by other agencies or investigators as an adjunct to their investigation and serves as a non-inflammatory source document to educate the jury.

Skeletal Trauma, Anatomical Charting, Fire Investigation

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