G56 Postmortem Genital Examinations With Colposcopy in the Evaluation of Fatal Sexual Violence Against Women

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The goals of this presentation are: to help attendees better understand the nature and appearance of the anogenital tissues at various postmortem intervals; to compare the results from photocolposcopy at various magnifications vs. single lens reflex (SLR) photography; and to determine if toluidine blue dye is a reliable and/or useful adjunct in the postmortem genital examination.

This presentation will impact the forensic science community by improving the diagnostic acumen of the forensic examiner; avoiding ambiguity of interpretation of clinical findings in postmortem genital examinations; and providing a framework for the medical evaluation of fatal sexual violence against women.

This paper proposes to describe ongoing research on postmortem genital anatomy. These cases comprise a significant portion of a baseline study of postmortem genital examinations, to better study fatal sexual violence against women. To this end, a detailed analysis of anogenital anatomy at various postmortem intervals is being conducted.

The focus of the present discussion is to describe the initial results of cases drawn from the Donated Body Program, at University of California, Davis, California. A total of 30 cases will come from this population and will form a subset of the final, larger project sample. Analysis of results from these baseline studies will allow eventual comparison to genital injuries sustained by both sexual homicide victims and living sexual assault victims. Data accumulated during this project will provide the core information for a *Sexual Homicide Database* (Crowley, AAFS/1998;2000; JFS/2004).

The operations base of the Donated Body Program at the University of California, Davis, California, is at the Sacramento County Coroner's Office Morgue. Most donors are received by the Program ≤ 24 hours of death. All cases selected for this baseline study are fresh, or fresh-frozen, vs. embalmed. Cases are examined based upon availability, i.e., female gender, and received by the Program in a time frame compatible with examination by the primary investigator.

A paucity of data exists on the "normal" appearance of the genital anatomy during the postmortem interval. We lack data from scrutiny and photodocumentation of the postmortem anogenital tissues. In living sexual assault victims, specific anogenital sites have been well-studied (Slaughter, Brown, Crowley, and Peck, 1997). The use of colposcopy is well established for both adult and child *living* victims. During the autopsy, gross visualization alone may not allow the detection of the more subtle findings that usually constitute genital trauma in sexual assault. Crowley described a mobile system for postmortem genital examinations with colposcopy (JFS, 2004).

Previously, the use of 1% toluidine blue as an adjunctive tool in fatal abuse cases was limited to select case examples. This nuclear stain has been incorporated as a practice standard by many programs, for the medical legal evaluation of living sexual assault victims. A review of the original methodologies was presented earlier (Crowley, AAFS/2005; 2007). Toluidine blue is specific for zones of parakeratosis and results can be due to inflammatory, benign, or malignant vulvovaginal diseases. Following application of toluidine blue dye in vivo, false positive results may be caused by 23 benign vulvovaginal conditions, in addition to cervical mucous. In nongenital sites, toluidine blue dye has been shown to yield positive results in granulation tissue (Crowley, 2007).

Using Crowley's mobile system of technology, the clinical phase of this research project began in March, 2007, at the Donated Body Program at the University of California, Davis, California. The research project is an observational study, with a cross-sectional design. The examination methodology employs photocolposcopy at 7.5X, 15X magnification, or both, plus 35 mm photography via the colposcope. Additional photographs are taken with a 35mm single lens reflex (SLR) digital camera, for comparison. Inspection and photodocumentation of specific anogenital sites is employed, prior to manipulation of the genital tissues. On select cases, concomitant application of a 1% solution of toluidine blue dye has also been incorporated, in order to evaluate the reliability of this general nuclear stain as an adjunct to the postmortem examination.

Available demographic data is collected on each case, which is assigned a unique identifier, for entry into a modified version of the *Sexual Homicide Database*. Eleven anatomic sites are routinely evaluated and documented on the postmortem worksheet. Inspection, labial separation, and labial traction are used to maximize visualization, in addition to speculum insertion and anoscopy. The nature and pattern of postmortem genital findings are described in a manner consistent with the proposed taxonomy for postmortem anatomy previously described by Crowley and Peterson (AAFS/2004).

Currently, a wide variation exists in the methodology for the examination of antemortem sexual assault victims. Protocols and procedures vary, especially with regards to adjunctive methods, e.g., application, timing, and interpretation of toluidine blue dye. Postmortem challenges are multifaceted; they may pose even greater significance than in living victims. Postmortem deposition of the victim's remains usually precludes the opportunity for a follow-up examination/re-evaluation. Moreover, when experts whose sole expertise is with the antemortem victim are asked to collaborate in a sexual homicide case, even greater challenges arise. The expert *must* consider working as a team member, not in a vacuum; their frame of reference cannot solely reside in the antemortem arena.

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The higher magnification potential of the colposcope affords greater opportunity for careful scrutiny and photodocumentation. This improves both the diagnostic acumen of the examiner and the quality of the postmortem genital examination. Colposcopy facilitates peer review, salient to the scientific process and eventual applicability of the research endeavor.

It is certainly true that in equivocal cases, the Forensic Pathologist can simply remove en bloc, for dissection and microscopic evaluation, the tissues germane to genital findings. However, it may prove to be beneficial to have an initial in situ examination of the anogenital anatomy via colposcopy.

The ultimate goal is to better visualize, in order to improve our understanding of what is normal in the anogenital anatomy during the postmortem interval.

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