



Pathology Biology Section – 2011

G100 Fatal Sexual Violence Against Women: Normative, Baseline Studies of Postmortem Genital Anatomy — What Can We Say About Normal?

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After attending this presentation, attendees will better understand the nature and appearance of the postmortem anogenital tissues; be able to discuss findings from control groups of normative, baseline studies for comparison with cases of fatal sexual violence; and discuss taxonomy, examination adjuncts, and database variables useful in the postmortem sexual assault evaluation.

This presentation will impact the forensic science community by improving the diagnostic acumen of the forensic examiner, helping avoid ambiguity of interpretation of clinical findings in postmortem genital examinations, and improving knowledge about fatal sexual violence against women.

Until recently, a paucity of data existed on the “normal” appearance of the genital anatomy during the postmortem interval. There is a lack of data from scrutiny and photodocumentation of the postmortem anogenital tissues. 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-AAFS: 2003). Comparisons to either living sexual assault victims or postmortem cases of non-sexual etiology were extremely difficult.

This presentation proposes to describe ongoing research on postmortem genital anatomy. These cases constitute the first normative, baseline data on the anogenital tissues during the postmortem interval. The focus of the present discussion is to describe the findings from two normative, baseline control groups, with a total sample of 48 female cases.

Group I consists of 30 female cases drawn from the Body Donation Program, at the University of California, Davis, California. Most donors are received ≤ 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 access by the primary investigator.

Group II consists of 18 coroners' cases, from another jurisdiction. These were also examined using the mobile colposcopy and examination system described by Crowley (JFS: 2004). The manner of death was accidental in seven cases and natural in 11.

Materials and Methods: This 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. In most cases, additional photographs are taken with a 35mm single lens reflex (SLR) manual or digital camera, for comparison to colposcopy. 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. The same 12 anatomic sites are visualized, inspected, and photographed in both controls and sexual homicide cases. These include the labia majora, peri-clitoral area, peri-urethral area, labia minora, hymen, vagina, cervix, perineum, fossa navicularis, posterior fourchette, anus, and rectum.

There are some core data elements germane to both control and sexual homicide groups. These include age and reproductive status, (pre-pubertal, reproductive age, peri-menopausal, and post-menopausal) and genital examination techniques. Other common variables include the unique case identifier, date and time of the examination, interval from death to arrival in forensic science morgue, general condition of body, race and ethnicity per CDC definitions, cause and manner of death, and contributory and/or concomitant medical and gynecological conditions, especially those presenting lesions.

The 30 female cases from Group I range in age from 60-99 years. The mean age is 83.1 years old. This is a largely homogeneous group; 93% of the sample is Non-Hispanic/White. The majority of Group I presented to the forensic science morgue within 24 hours. Postmortem mucosal autolysis was present at a minimum of one out of the 12 anatomic sites in 80% of the sample. Postmortem skin slip in the anogenital area was present in 16.6%. A 1% Toluidine blue dye solution was applied and decolorized with a dilute acetic acid solution in 21 of the 30 body donor cases. There was a false positive uptake in 100% of the cases. This was true regardless of the anatomic site of dye application.

The age range for the 18 cases in Group II was 32 months to 89 years of age. The mean age was 47.87 in this Group. The ethnicity and race distribution was as follows: Non-Hispanic/White (66.6%); NonHispanic/Asian Pacific Islander (5.5%); Hispanic/White (11%), and African American (16.6%). The postmortem interval to arrival at the forensic science morgue was ≤ 24 hours in 88.8%, 96 hours in 5.5%, and ≥ 5 days (active decay) in 5.5%. Postmortem mucosal autolysis was present in greater than 50% of Group II. Toluidine blue dye was not applied to any in this sample.

Discussion: The postmortem arena superimposes a unique set of factors. Many were not previously



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studied or documented in the literature. Analysis of results from baseline studies allows eventual comparison to genital injuries sustained by both sexual homicide victims and living sexual assault victims. A relational database was described (Crowley, AAFS: 2010) as a method to simplify and quantify data for interpretation, analysis, and linkage to other cases.

Taxonomy germane to the postmortem arena should incorporate salient terms that will be consistent and universally applicable and acceptable within the forensic community (Crowley & Peterson: AAFS, 2004). Postmortem artifact, such as *mucosal autolysis* and *skin slip*, visualized in the anogenital tissues, is documented for each anatomic site. Inclusion into case documentation permits aggregate summaries of individual and population-based summaries. Appropriate taxonomy and correct identification of “normal” will help improve our diagnostic acumen and increase the reliability of our methodology.

The significantly false positive results obtained from application of Toluidine Blue dye on the postmortem anogenital tissues should preclude any recommendation for its use in the postmortem sexual assault examination. It appears to be consistently picked up by the shedding tissues that comprise part of the normal artifact. The inexperienced examiner might misconstrue this for a significant finding.

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 of this research is to improve our understanding of what is normal, and what is not, during the postmortem interval for the anogenital tissues. In this manner, the capacity and understanding of fatal sexual violence against women will continue to grow.

Fatal Sexual Violence Against Women, Body Donation Program, Colposcopy