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## A Mobile System for Postmortem Genital Examinations with Colposcopy: SART-TO-GO

**ABSTRACT:** The interpretation of genital findings in the deceased is a vital and timely issue. A paucity of information exists on the nature and appearance of the anogenital tissues in the postmortem interval. The traditional postmortem genital examination consists of gross visualization, which may preclude detection of the subtler trauma that usually constitutes injury in sexual assault. The mobile system grew out of a need to bring the examiner to the patient, e.g., in jurisdictions that lack a centralized morgue. The theoretical framework of the methodology lies in the sexual activity that culminates in the death of the sexual homicide victim. This sequential methodology was based on the Sexual Assault Response Team (SART) model, with adaptation to the autopsy milieu. Colposcopy is well-established for the medical-legal investigation of living sexual assault victims. During the author's initial rape-homicide examinations, only gross visualization was available. It soon became apparent that a system that facilitated detailed scrutiny of the anogenital tissues at various postmortem intervals was needed. Colposcopy was selected as the examination method because of its magnification, photodocumentation, and peer review potential. The sequential protocol was developed and refined during an ongoing accumulation of baseline cases. The role of the forensic nurse examiner is described within a defined scope of expertise and as a collaborative member of the homicide investigative team.

**KEYWORDS:** forensic science, postmortem genital examination, forensic nurse examiner, colposcopy, mobile SART, sexual homicide

Sexual activity is the basis for a sequence of acts that may involve the death of the victim. Research on sexual murderers suggests that these crimes are based upon persistent, violent sexualized thoughts and fantasies (1). As a result, the meaning and performance of the acts committed during the murder varies with the offender. These sexual acts may range from actual rape (with penetration before or after death) to symbolic acts, such as insertion of foreign objects into body orifices of the victim. (2).

Identification of an offender's sexual motivation for a homicide is based upon:

- accurate assessment of information regarding the victim
- crime scene(s)
- forensic reports

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- 7th Meeting of the International Association of Forensic Nurses, Scottsdale, AZ. Aug. 1999.
- 52nd Annual Meeting, American Academy of Forensic Sciences, Reno, NV. Feb. 2000.
- Medical School, Trinity College, Dublin, Ireland. Nov. 2000.
- 54th Annual Meeting, American Academy of Forensic Sciences, Atlanta, GA. Feb. 2002.
- Annual Meeting of the California Sexual Assault Investigators Association, Rancho Mirage, CA. Oct. 2002.
- Forensic Focus conference, Scottsdale, AZ. June, 2003.

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- nature of the behavioral exchange between the victim and offender (14).

Four basic types of sexually-motivated homicide offenders were identified in the crime classification system devised by Douglas et al. (2). These include organized, disorganized, mixed, and sadistic offenders.

The organized offender engages in a significant amount of pre-planning. He often targets his victim(s) in order to decrease his own risk to commit the crime. The crime scene typically suggests that the offender maintained control of the victim. A methodical, ordered behavioral pattern is evident. Attempts to prevent or eliminate physical evidence are common.

With the disorganized offender, the crime appears to have been unplanned and, to some extent, spontaneous. There is little evidence that the offender had control of either the victim or himself during the crime. Little or no effort is expended to reduce or eliminate incriminating physical evidence at the scene. The highly disordered crime scene often reflects the offender's youthfulness, intoxication, or mental instability.

The mixed crime scene reflects aspects of both an organized and disorganized offender. Numerous circumstances may be responsible for this classification type, including:

- multiple offenders
- development of unanticipated events during the commission of the crime, such as physical resistance by the victim
- alcohol or drug use by the offender
- emotional change in the offender during commission of the crime.

The sadistic offender obtains sexual gratification via the victim's response to torture. Sexual activity is paired with domination, degradation, and violence, culminating in the death of the victim. This offender often engages in significant pre-planning and scene

preparation. This ensures his ability to keep and control the victim for an extended period of time, without interruption by potential witnesses (14).

#### *Sequential Methodology for the Evaluation of the Sexual Homicide Victim*

A methodology that incorporates all facets of the examination process helps to ensure that the myriad aspects of the entire evaluation will be completed. Many jurisdictions and programs vary in how and by whom protocols are implemented. A sequential approach minimizes omissions and avoids errors.

Prior to the actual autopsy, it is essential to clarify individual roles and responsibilities in areas of potential overlap, such as clothing collection, photography, and documentation of nongenital wounds and bitemark samples (3). For example, in living victims, the forensic nurse examiner is responsible for clothing collection, packaging, and documentation. This may or may not be the case at a particular autopsy. Protocols, individual expertise, and job descriptions will vary. Ultimately, the anogenital examination is not done in a vacuum without consultation with other experts on the team. Thus, if a forensic odontologist is unavailable at the autopsy, it may be the forensic nurse examiner that must do everything possible to ensure that the best possible evidence is referred for eventual analysis and expert opinion. If possible, conduct the genital examination and collect anogenital specimens prior to the general autopsy. This may be done after the forensic pathologist has done a preliminary overview of the body and noted gross features such as clothing. This allows prompt collection of biological specimens and avoids obscuring the genital area by leakage of body fluids through the vaginal opening. (4).

Set up the work area with all necessary examination equipment. (Table 1, Fig. 1). Open a sealed Sexual Assault Evidence Kit. Ar-

range items to facilitate collection. Swabs and slides can be lined up in a Lucite air drying box, in slots pre-labeled or marked with a pencil or slide marker for each body cavity or anatomic site (Table 2). Have a 10% bleach solution available to disinfect the swab-drying box between patients.

#### *Salient Case Data*—Gather the following information:

- Note investigating law enforcement agency, examining pathologist, and case ID number
- Number of victims/suspects
- Type of case (natural, suicide, accident, homicide)
- Date/time/location where the body was discovered
- Interval: body discovery to refrigerated morgue storage
- Date/time/location of the postmortem genital examination
- General interval: body discovery to examination  $\leq 24$  hours  24–48 hours  48–72 hours  72–96 hours   $\geq 5$  days  Unknown
- Note if a suspect(s) was apprehended. Is a suspect medical-legal examination to be done?

*Demographic Data*—Include identifying information about the victim and the general appearance of the body at the time of discovery. Obtain any known information about the event. There is often a paucity of information at this initial point in the investigation. The forensic examiner can document the “need to review the medical history, when available.” Document the following, and indicate when particular information is unknown:

- Name (alias, nicknames)
- D.O.B., age/apparent age
- Gender (male  female

TABLE 1—Components of the mobile system: “SART-TO-GO”.

Colposcope & Camera	Exam Equipment	Evidence Kit & Supplies	Other	Documentation
Colposcope	Vaginal specula, various sizes, individually wrapped	Sealed sexual assault evidence kit	Wood’s lamp	Medical-legal forms
Rolling base			Alternate light source (optional)	Autopsy diagrams/traumagrams
Colposcope mount system	Anoscopes-individually wrapped	Extra Dacron/cotton swabs, slides	Film for fluorescent & reflective imaging (optional)	
Travel case	Rubber-bulb syringe	Extra bindles & paper bags	Bitemark impression material (optional)	Dictation format
Folding ramp for loading colposcope	Balloon-covered swabs		Gloves	
Foot pedal (optional)	Procto/rectal swabs	Sterile water: bottle or single-use plastic vials	Scrubs	Photographs, prints, slides
Autowinder for 35 mm SLR	Sterile scalpels, slides		Personal protective equipment	Videos, CDs
35 mm SLR Camera: Databack or unique ID system		Post-its; Suture removal kits (with scissors), Pipettes, syringes	10% bleach solution Disinfectant solution/wipes	Supplemental medical records
Colposcope ID Tag; Various lenses, macrolens	Body positioning aides: Headrests		Protective coverings for camera/colposcope*	
Flash system, optional ringflash, 35 mm film (slides or prints)		Lucite swab-drying box		
L-shaped ABFO-scale	Sandbags (vinyl-covered; at least 4.5 kg each)			
Optional camera systems: Digital, video; Tripod (optional)	Urine specimen cup			

\* Cut fingers off of powder-free exam gloves. Stretch over camera, lenses, colposcope handles, etc., to keep clean. Disposable shower caps can also be used.



FIG. 1—SART-TO-GO-Mobile Colposcope Unit: colposcope with rolling base, hard travel-case, and folding motorcycle ramp, for loading. (Used with permission of CooperSurgical/Leisegang, Inc.)

- Ethnicity (Hispanic/NonHispanic)
- Race: White  African-American  Asian/Pacific Islander  American Indian/Alaska Native  Other/Unknown
- Address (street, city, county, state/province, zip, country)
- Social Security number, Driver's License number, passport:
- Was the decedent institutionalized?

*Disposition of the Body at the Crime Scene (5,6)*—Gather the following information:

- *Who* found the body?
- Last *known* time the decedent was seen; by whom?
- Position of the body when it was discovered (openly displayed, concealed/hidden, unknown)
- *Staging* (the body is intentionally placed in an unnatural/unusual position)
- Ligatures/other restraints:
  - type of binding material: gag, blindfold, other
  - location of the restraint on the body. Was it left on the victim or found at the scene?
- Weapon use? If yes, note the type of weapon. Was the weapon left at the scene?
- Condition/disarray of clothing on the victim's body or at the scene: fully/partially dressed, completely nude, redressed,

cut/torn, items missing, unknown. Were the clothing and/or bed linens removed from the crime scene?

*History*—If available, the examiner should glean as much as possible about the victim's prior health history and lifestyle. The *source* of that information also should be noted in the documentation.

- Past medical history, surgeries, allergies, any significant recent weight loss/gain
- Psychiatric illnesses
- Prescription medications, over-the-counter medications, supplements, herbs, hormones
- Physical disabilities, assistive devices, amputations, skeletal defects
- Was (female) victim pregnant? If yes, note the estimated day of delivery (EDD) or number of weeks. (Note if determined by history, examination by forensic pathologist, or both).
- Known gynecological conditions, number of children
- Last medical/gynecological exam
- Last menstrual period (LMP)
- Consensual sexual activity ( $\leq 5$  days), or last known consensual sexual activity
- Occupation/means of support
- Lifestyle (e.g., homemaker, student, professional, technical/trade, homeless, runaway, prostitute, hitchhiker, drug user/seller, other, unknown)
- Sexual orientation: heterosexual, homosexual, bisexual, transgender, unknown  transsexual (male to female  female to male
- Relationship of the victim to the offender (stranger, acquaintance, relative, spouse/ex-spouse, boyfriend/ex-boyfriend, employee, co-worker, neighbor, other, unknown).

#### *General Physical Examination*

Describe the general condition of the body (fresh, active decay), after consultation with forensic pathologist:

- presence of rigor mortis, livor mortis, algor mortis
- insect activity  rodent/animal activity
- Height, weight (estimate  measured
- Hair (color/length/style)
- Eye color
- Glasses, contact lenses/prosthesis
- Teeth/condition (none, dental work, braces, dentures)
- Describe presence of vomitus, feces, urine?
- Scars, tattoos, birthmarks, moles, piercings, other, writing/drawing on victim's body.

*Clothing*—Assist with collection of clothing found with or on the body. It may be useful to evaluate clothing for relation to salient features of the crime, e.g., weapon use, undergarments on backwards or inside-out. Observe for rips, tears, stains, foreign matter. If the victim's clothing has not been removed already, place 2 sheets of examination paper on the floor to collect bits of trace evidence/debris that may fall from the clothing. Do not shake clothing items. Avoid folding clothing items across a stain. Collect debris, fibers, foreign material. Inspect and package clothing over these protective sheets. Examine each item of clothing. Scan items with a light source, such as a Wood's Lamp or alternate light source. Tears in the victim's clothing produced by stab wounds may correspond to wounds on the victim's body. If desired, the examiner

TABLE 2—Orifices and swabs.

Site	Adult	Child	Reference
Oral	2 swabs; 1–2 dry mount slides	Same as for adult	Saliva: Gauze square or 2 saturated swabs
Vagina	4 swabs from vaginal pool; 1–2 dry mount slides; 1 wet mount slide	2 vestibular swabs (inside labia minora, over hymenal surface); 2 dry-mount slides; Pubertal: same as for female adult	Blood Head hair: 20–30 tugged hairs Chest/facial hairs: representative samples Pubic hair: 20–30 tugged hairs.
Vaginal Lavage	3 cc sterile saline or water; collect with pipette or syringe into sealed tube/vial.		
Cervix	2 swabs; no slides		
Male Genital	2 penile swabs (1 shaft, 1 glans); No slides 2 scrotal swabs, held together; No slides	Same as for adult	
External Genital	2 swabs, held together; 2 slides (over surface of labia majora, fossa, fourchette)	Vulvar: 2 swabs (external surface of labia majora)	
Anal	2 swabs (inserted 2 cm, or through anoscope); 1–2 dry mount slides	2 swabs 1–2 dry mount slides	
Dried Secretions or Areas of Positive (+) Fluorescence	2 swabs (separate pair of swabs of each stain), e.g., bitemark for saliva, dried blood, semen. Smear swabs on 2 slides.	Same as for adult	Body control swab: Moisten swab with sterile distilled water. Collect 1 sample from unstained or contralateral area of body. Label as “W.L. control,” (No slides).
Debris	Collect all debris (grass, sand, loose hairs, fibers, etc), found upon gross examination. Place debris into sheet of paper; fold into bundle to minimize loss. If debris is in more than one location, collect each into separate bundle. Place bundle(s) into larger envelope.	Same as for adult	
Fingernail Scrapings	Carefully place material and scraping tool (wooden applicator, toothpick) into bundle. Collect and package each hand separately. Return evidence envelope to outer envelope.	Same as for adult	
Pubic combings	Place bundle under buttocks; comb pubic hair toward paper to collect debris. Fold comb/brush with debris, into paper. Place folded paper into evidence envelope.		
Crusted Stains (may be semen or blood)	Collect by gently scraping with edge of clean glass slide or back of sterile scalpel blade into appropriate bundle or envelope. If material is in pubic hair, the matted hairs should be cut out and packaged separately.	Same as for adult	
Condoms	Collect the entire item. The criminalist will collect separate samples from the external and internal surfaces of the condom. Minimal handling is essential. Place condom in a paper bag/envelope. If visible liquid is present in the condom, and it cannot be sampled right away, package in an airtight container and freeze.		

\* Preparation and packaging of biological evidence for criminalistics laboratory: Swabs and slides should be individually labeled and coded to show which slides were prepared from which swabs, with a notation of the date/time collected. All swabs and slides should be air-dried for 60 min in a stream of cool air. Containers for individual items (tubes, bindles, envelopes, bags) should be labeled with the patient's name, contents, anatomic site, exam facility, date/time, and the initials of the collector. A copy of the medical-legal examination form should be included in the sexual assault evidence kit. The kit should be sealed with tamper-resistant seal that includes date, time, and initials. Staples alone are an insufficient seal. (Personal Communication: E. Devine.)

can use backlighting of clothing items (7). Photograph items as appropriate. Package each clothing item separately, in paper bags. Ensure that any bedding or linens were collected from the scene. Itemize and describe the items that have been collected. Note obvious stains, tears, etc., on paper bag(s). Package the top sheet of paper into a separate bundle/bag. Discard the bottom sheet of paper.

#### *Urine Specimen, Serology, Toxicology: Assist with Collection or Verify Collection by Medical Examiner*

Observe wounds and body cavities for signs of debris, trace evidence, and/or body fluids.

Scan the body for suspicious stains/fluorescence: darken the room; scan the entire body, using a Wood's Lamp or Alternate Light Source; check for stains and areas of positive (+) fluorescence.

To collect a sample of areas that fluoresce or that have visible stains or dried secretions, use Sweet's double-swab technique (8). Using a pair of sterile cotton swabs:

- Saturate the tip of Swab #1 with sterile distilled water. Roll the swab's long axis along the skin surface, using moderate pressure and circular motions. This ensures maximum contact between the swab and skin and washes dried saliva from the surface.
- Swab #2 is collected with the same technique, but with a dry swab. Rotate the dry tip over the skin to recover moisture that remains on the surface from Swab #1. Roll swab #2 over the entire area to ensure the removal of all moisture.

Swab each dried secretion with a separate pair of swabs, e.g., bitemarks for saliva, dried bloodstains, or possible semen. Dried

blood may be scraped off with a sterile scalpel. Also using sterile, distilled water, collect a control swab from an unstained area of the body, preferably adjacent to the stain, if not, on a contralateral body part. A single body surface control swab should be sufficient for comparison (no slide). Air dry, package as for other specimens, and document findings on traumagrams.

### *Evaluation of Nongenital Trauma (NGT)*

Within the scope of this paper, the forensic nurse examiner is *not* primarily responsible for examination, interpretation, or documentation of nongenital trauma in sexual homicide victims (3).

Conventional terminology, i.e., blunt vs. sharp trauma, should be used to describe the nature and appearance of both nongenital and genital trauma (9). In addition to the customary wounds and defense injuries often seen in homicide victims, the following nongenital trauma may be present in sexual homicide victims:

- Signs of sexual bondage. Focus on the neck, ankles, and wrists. Typical characteristics of sexual bondage include:
  - symmetry, neatness, and balance
  - The victim is bound in a variety of positions, and often photographed in these positions
  - The binding is more than necessary to control or secure the victim's movement (the intent is to cause suffering, pain, and humiliation).
  - The binding is elaborate and excessive
- Wounds in various stages of healing: with the sexual sadist, victims may be held and tortured over several days or longer.
- Bitemarks: Photograph with L-shaped ABFO scale. Take at least 1 photograph without the scale. Obtain orienting and close-up photographs. If desired, the colposcope also may be used for photography of nongenital findings. At lower magnifications, e.g., 5X or 7.5X, detailed magnified photographs can be taken. Measure and swab, using double-swab technique (8). If casts are taken of bitemarks for referral to a forensic odontologist, follow ABFO protocol (10).

Photograph other nongenital trauma, as for bitemarks. The protocol may vary by jurisdiction. These photographs may be taken by a forensic odontologist, law enforcement, the evidence technician, pathologist assistant, forensic pathologist, or the forensic nurse. In many cases, the forensic nurse examiner may take only select photographs of some of the major nongenital injuries and provide only limited documentation on the medical-legal forms. In this case, a general description of these injuries may be accompanied by a notation, such as "defer to ME's report" (3,4,11).

If ligatures are left on the victim, photograph while they are still in place. Knots should not be untied. When removed for submission to the criminalist, the ligature should be cut away from any knots, and the cut should be marked. The ligature should be placed into a paper bag or envelope (15).

### *Head/Oral*

Photograph the face with ID tag and ABFO scale. Take at least 1 photograph without the ID and scale. Collect foreign matter, debris, and fibers from the hair, face, and neck. Place in a bindle or paper envelope. Label and seal.

Perioral swabs may be collected for potential seminal fluid. For suspicious stains in the perioral area, swab the area around the mouth. Collect dried secretions, also using double-swab technique.

Collect moist secretions with dry swabs to avoid dilution. Inspect the oral cavity, frenulum, inside of the lower lip, and the pharynx for exudates, lacerations, ecchymoses, or petechiae. Note chipped teeth. Excessive blood or trauma may preclude a complete inspection, which may need to be deferred to the pathologist. Collect 2 oral swabs from the oral cavity, and make 1–2 dry-mount slides.

- Technique: holding 2 swabs together, swab the area from the gums to the tonsillar fossae, the upper and second molars, behind the incisors, and the fold of the cheek. Prepare 1–2 dry mount slides from the swabs. Label the slide to correlate to the swab from which it was made.

To collect head hair reference samples, tug and collect 20–30 hair samples, representative of different areas of the head (front, top, sides, and back). For males, collect samples of facial hair. Package, label, and seal.

Collect a saliva reference sample. Depending on crime lab preference, these may be:

- 2 dry swabs inserted into the mouth. Sweep between the cheek and gum until saturated.
- Cotton gauze/pledget: place under the tongue until saturated; use a clean forceps to handle.

### *Fingernail Scrapings*

Use the tool provided in the evidence kit (toothpick or wooden manicure stick). Scrape under each fingernail, one hand at a time. Place all scrapings from one hand into a separate container (bindle/bag). Label and seal both containers.

### *Genital & Anal Examination*

If the victim is a child or adolescent, assess and document the Tanner stage. Perform the initial inspection with gross visualization. Document insect activity (maggots), skin slip, blood, dilatation, prolapse, or other postmortem artifact, and visible injury seen grossly. Note the presence of other gynecological conditions, such as adhesions or lichen sclerosis. Using a Wood's Lamp or Alternating Light Source, scan the anogenital area and surrounding skin (anterior and posterior body surfaces, thighs, buttocks, and anogenital area). Collect swabs of suspicious areas. Label: "W.L. #\_," and note the anatomic site. Make a control swab, if one was not made earlier. Cut/collect any matted pubic hair into designated bindle/envelope.

To collect pubic hair combings, place clean examination paper or paper towels underneath the buttocks. If this area is very wet, simply spread the legs enough to position the paper between the legs, so that it "catches" the combings. Comb/brush pubic hair toward the paper, to collect debris and loose hairs. Fold/package the comb/brush with the debris into the paper, and place into the bindle. Place the folded paper/towel into a separate bindle. For pubic reference samples, tug 20–30 hairs, from different areas of the pubic hair. Place into a labeled paper bindle/envelope.

### *Colposcopic Examination (Fig. 1).*

Record the colposcope magnification setting. Initial the colposcope ID tag, set a camera databack, or otherwise implement a unique case identifier for case photographs. Chain-of-custody must be maintained for colposcopic photographs, CDs, or videos, as for other physical evidence.

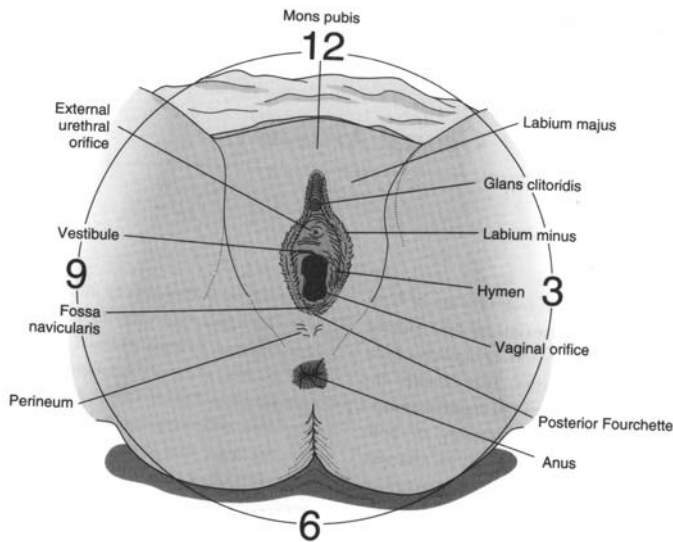


FIG. 2—O'clock face: external female genitalia. Reproduced from Ref. (12) with permission of McGraw-Hill Companies.

Initially inspect the vulva utilizing only gross visualization. Use labial separation to expose the introitus: separate the labia majora laterally and slightly downward, with the fingertips of one or both hands. Inspect and photograph the following anatomic structures (Fig. 2):

- Labia majora
- Clitoris, clitoral hood, and peri-urethral area
- Labia minora (inner and outer aspects of each labium minus)
- Fossa navicularis
- Posterior fourchette
- Perineum
- Hymen and distal portion of the vaginal barrel

(Note: inspect the hymenal borders without, then with labial traction).

#### Labial Traction

Each labium majus is grasped between the examiner's thumb and index, or thumb, index, and middle finger. Both labial edges are gently pulled outward and slightly upward, in a direction toward the examiner, with slight lateral traction on both edges. This widens and opens the vaginal orifice, exposing most of the hymenal rim and distal vagina. In the young child, the examiner may be able to see the cervix due to postmortem dilation of the hymenal opening.

- In the prepubertal child, note the shape of the hymen: annular, crescentic, cribriform, or septate.
- With the aid of colposcopic magnification, minute particles of debris or foreign material may be noted in the genital area. These can be collected by "catching" the particle on the tip of a swab, while simultaneously viewing through the eyepieces of the colposcope. Moisten the swab very slightly with sterile water. The particle and swab can be placed onto the sticky edge of a post-it. Place the post-it in a paper bundle or envelope to avoid loss (12).

External genital swabs may be collected by moistening swabs with distilled water; swab the labia and vulva with 2 swabs held together; smear swabs on 1–2 slides.

#### Speculum Examination

Before inserting an individually-wrapped speculum, carefully photograph the areas of the vulva that may initially stretch during insertion of the speculum (labia minora, hymen, fossa, posterior fourchette, and perineum). Use as large a magnification as possible. This will provide a baseline to show the initial integrity and appearance of the anogenital tissues, in the event of iatrogenic trauma. An additional measure to ensure good visualization with minimal tissue manipulation is to ensure that the patient's position approximates lithotomy as closely as possible. Standard autopsy headblocks and vinyl-covered sandbags (weighing at least 4.5 kg each) can be used to position the legs open and/or to elevate the upper thighs above the level of the buttocks. These measures will improve visualization of the entire anogenital area.

- If necessary to lubricate the speculum, use only sterile water. Spread the labia majora from above, while holding the speculum in the other hand. Before collecting any samples, inspect the following internal landmarks, using gross visualization, followed by colposcopy:
  - Vaginal walls
  - Cervix
  - Cervical os

During the speculum exam, evaluate the integrity of the vaginal mucosa and the appearance of the vaginal rugae. The earliest signs of estrogen loss during menopause occur here. Atrophic changes of the vaginal epithelium are flattening of the vaginal rugae and a smoother, more tubular contour of the vaginal interior.

#### Collection of Vaginal Swabs

- Simultaneously collect 4 vaginal swabs from the vaginal pool, in the posterior fornix of the vagina (Fig. 3). Arbitrarily designate the swabs as #1, #2, #3, and #4. Make 1–2 dry mount slides (#1, #2) to correspond with swabs #1 and #2.
- The 3rd swab is arbitrarily correlated to the "Vaginal wet mount" slide. The 4th swab is extra (Vag. #4). All slides are labeled to correspond to the swab from which they were prepared.
- Place a drop of normal saline or buffered nutrient medium on the 3rd vaginal slide to preserve any sperm motility. Roll this swab back and forth in the drop to transfer cellular debris to the drop. Place a cover slip on the slide, and examine within 5–10 min using a biological microscope. Scan first at 100 power (10X) to discern sperm. Examine more closely at 400 power (40X) to determine if sperm are present. Nonmotile sperm are best visualized after fixing and staining by the criminalist (12).
- From the cervix, collect 2 swabs.
- If a vaginal aspirate/lavage is collected, instill 3 cc of sterile saline or water through the speculum blades. Aspirate the contents with a pipette, and place into appropriate labeled tube or vial, sealing carefully. (12).

#### The Anal and Rectal Examination

- Note the presence of "normal" postmortem dilatation and lividity.

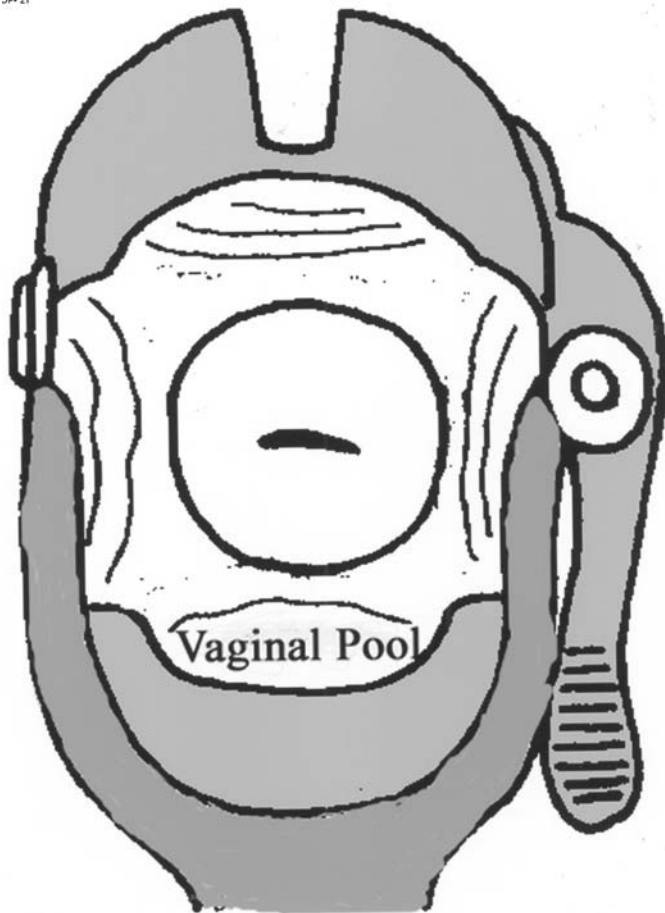


FIG. 3—View through the speculum: collection of vaginal swabs from the vaginal pool.

- Check for the presence of an abnormal mass within or upon the anal orifice.
- Note skin pigmentation, skin tags, and folds of anal tissue; these are generally normal findings.

Using gross visualization, followed by colposcopy, inspect and photograph the perianal area and anus.

Using very gentle traction, carefully and systematically apply gentle lateral traction to the entire perianal area in order to separate the folds. This allows visualization of the anal verge and anus. Proceed from 12 o'clock, to 3 o'clock, to 6, 9, and back to the 12 o'clock position. Tears can easily be obscured within these folds of tissue.

- Collect any dried secretions seen grossly or with use of the Wood's Lamp or alternate light source. Use distilled water to moisten the swabs. Label the swabs as "perianal", to differentiate from the rectal samples.
- Using only sterile water, gently clean the perianal area, to avoid contamination of rectal swabs from any runoff vaginal drainage already present on the perianal skin. Avoid friction, which may denude friable tissues.
- If no anoscope is available, collect 2 rectal swabs by moistening slightly with sterile water. Insert them one at a time through the rectal sphincter to a distance of about 2 cm. Prepare 2 dry mount slides.

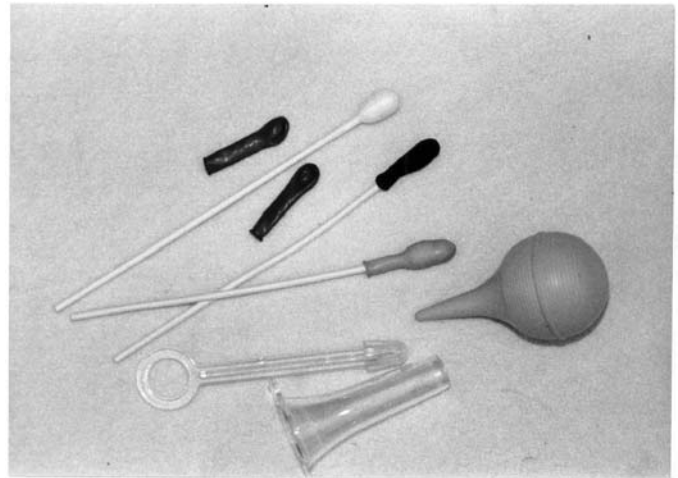


FIG. 4—Examination adjuncts: disposable anoscope with obturator, rubber bulb-syringe, and balloon-covered procto/rectal swabs.

#### Anoscopic Examination

- Insert the anoscope gently into the anal canal, in a direction pointing toward the umbilicus. Remove the blunt-tipped obturator (Fig. 4).
- Using the colposcope, inspect the rectum for bleeding or tears. Photograph the rectal mucosa.
- Hold 2 swabs together, and insert through the anoscope; collect rectal samples.
- Make 1–2 dry mount slides, labeled to correspond to rectal swabs.
- As the anoscope is withdrawn, observe the rectal mucosa at different levels.

(Note: in some patients, copious amounts of feces may preclude the collection of satisfactory rectal samples. Consult with criminalist as necessary.)

After the collection of swabs and slides for biological evidence, adjuncts may be employed to re-examine the hymenal borders. Microtrauma may be obscured within the hymenal folds of a redundant hymen. Balloon-covered swabs "splay" the hymenal rim. This enhances photographic contrast of partial or complete hymenal transections. A rubber-bulb syringe can be used to squirt water from directly above the vaginal opening of a pre-pubertal female. As the hymenal tissue "floats" inward and outward, the margins can be inspected and photographed (Fig. 4).

#### Genital Examination of the Male Victim

1. Open a sealed evidence kit. Prepare and pre-label swabs and slides. (Table 2).
2. Obtain salient case data: exam date/time/site, investigating agency and case ID, examining pathologist, number of victims, type of case, and interval since discovery of body.
3. Demographic data of the victim: name, D.O.B., gender, race, ethnicity, address, Social Security number, driver's license number.
4. Disposition of the body at the scene: when, where, how the body was found; staging, ligatures.
5. History: past medical history, medications, lifestyle, sexual orientation, victim/suspect relationship.
6. General physical examination: height, weight, hair, eyes, condition of the body.

7. Clothing: collect over 2 sheets of paper. Note tears, stains, debris. Inspect, scan, photograph, as appropriate. Package items separately.
8. Scan the entire body for suspicious stains/fluorescence: use Wood's Lamp/Alternate Light Source. Collect dried secretions and areas of positive fluorescence. Collect 1 body control swab. Note on traumagram.
9. Evaluation of nongenital trauma: measure, document, and photograph defense wounds, bruises, lacerations, abrasions, and bitemarks. Use L-shaped ABFO-scale. Using double-swab technique and distilled water, swab bitemarks for saliva. Refer to Forensic Odontologist and cast, per local protocol and ABFO guidelines.
10. Head/oral: collect foreign matter/debris in the hair. Collect hair reference samples (20–30 representative samples). Add samples of facial hair and chest/body hair to standard reference samples. Inspect and scan the perioral area: swab if positive fluorescence. Inspect the oral cavity, frenulum, and inside lower lip for signs of trauma and petechiae. If appropriate, photograph (can use magnification with colposcope 5X or 7.5X). Collect 2 oral swabs, and prepare 1–2 dry mount slides. Collect a saliva reference sample (gauze square or 2 swabs).
11. Fingernail scrapings/cuttings: package the left and right hand separately.
12. Genital examination: Evaluate and record the Tanner stage, if adolescent or child victim. Inspect and scan the inner thighs, perineum, buttocks, and perianal area. Collect foreign material and/or matted pubic hair. Collect any dried/moist secretions. Comb pubic hair, and package comb/brush into envelope. Collect 20–30 pubic reference samples.
13. Inspect the penis (glans, foreskin, and shaft) and the scrotum for signs of trauma (11). Check the glans for injuries, abrasions, or tearing of the urethral meatus. Photograph injuries. If the victim is uncircumcised, collect any retained foreign matter or secretions underneath the foreskin. Collect 2 penile swabs, 1 from the glans and 1 from the shaft. Moisten the swabs slightly with distilled water. Collect 2 scrotal swabs; no slides (individual crime labs may request slides in addition to swabs). Moisten the swabs, and hold both together during collection. Focus on the areas of the scrotum that are in closest proximity to the shaft of the penis.
14. Anal: inspect for anal and perianal trauma. Photograph with colposcope. Collect any dried perianal secretions using Sweet's technique. Insert the anoscope. Inspect and photograph the rectal mucosa. Collect 2 rectal swabs through the anoscope. Prepare 1–2 dry mount slides to correspond to each rectal swab.
15. Lab: verify collection of urine specimen, serology, and toxicology by medical examiner.
16. Summary of findings: document on medical legal forms, traumagrams; supplemental narrative dictation; document the nature and pattern of the anogenital tissues; note concomitant postmortem tissue changes.

#### *Documentation of the Genital Examination of Sexual Homicide Victims*

The examination forms the basis or framework for all medical-legal reports (13). This includes the medical-legal forms, summary of findings, and any supplemental narrative reports. The examiner should note any other records or reports that, if available, would be

useful for later review. This may include past medical records and recent gynecological examination records.

A copy of the medical-legal form should be included in the evidence kit for submission to the criminalist. Existing SART or medical-legal exam forms designed for living sexual assault victims need to be adapted for use in the postmortem examination. These forms allocate a large section of documentation to the history of the assault, as related by a living victim, who can usually recount details of the assault, including sexual acts, threats, and other behaviors.

Clarify any areas where the primary responsibility for both the evaluation and documentation was not assumed, e.g., the evaluation of nongenital trauma and interpretation of postmortem tissue changes.

Document examination methods used for the examination: gross visualization, colposcopy, hand-held magnifier, 35 mm photography, speculum examination, and/or anoscopy. Specify any adjuncts used during the examination, such as balloon-covered swabs, rubber bulb syringe, Wood's Lamp, alternate light source, reflective photography, videos.

Specify items of clothing that were examined and collected at the time of the anogenital examination. Carefully document which evidence was collected, packaged, and submitted to the crime lab in conjunction with this examination.

In the summary of findings for the postmortem anogenital evaluation, describe the nature and pattern/location of any injuries. Distinguish multiple versus single sites of injury. Describe the overall appearance and integrity of the anogenital tissues. This may include concomitant postmortem tissue changes, e.g., lividity, dilatation, skin slippage, or mucosal shedding.

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