



ON THE EDGE

The Official Newsletter of the International Association of Forensic Nurses

Manual and Ligature Strangulation

Ruth I. Downing, BSN, RN, SANE-A

Strangulation, whether by hand (manual) or ligature, results in blunt force injury to neck tissues. A review of historical and current literature on the subject shows there is a pattern of injury specific to this type of trauma, along with evidence of asphyxiation and altered hemodynamic, neurologic, and psychological states. Patients presenting with no external evidence of trauma may have internal injuries that are life threatening.

This article will discuss the patho-physiologic aspects of manual and ligature strangulation, the potential complications that may ensue following neck trauma, and the medicolegal issues involved.

Background

Strangulation accounts for 10% of all violent deaths in the United States (Funk & Schuppel, 2003; McClane, Strack & Hawley, 2001). Many people survive strangulation, and it is most common among female victims of intimate partner violence. A survey of battered women revealed that 68% experienced strangulation as a method of violence. The methods used were manual (53%); rope, clothing, seatbelt, and chain (8%); forearms (5%); and multiple methods (31%) (Wilbur et al., 2001). Manual methods may be with one hand, two hands, or with the arm bent at the elbow (commonly referred to as a choke hold).

continued on page 9

Figure 1.

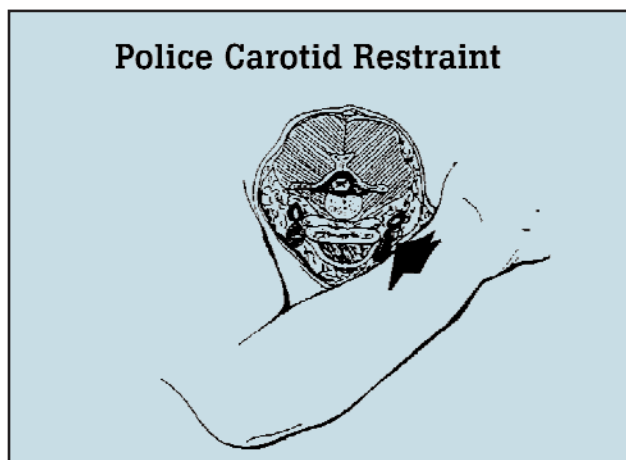
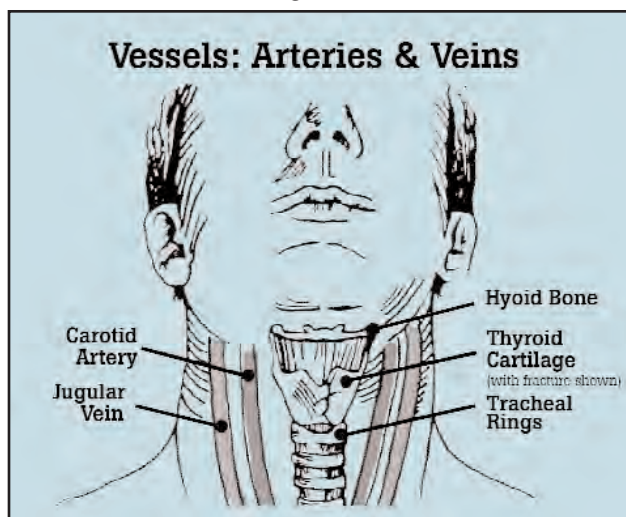


Figure 2.



Diagrams of police restraint hold (top) and neck anatomy (above).

Used with permission, IMO Productions (2001). San Diego Family Justice Center. Strangulation Training Video: Never Let a Victim Die in Vain (<http://www.imoproductions.com/>).

Inside

FEATURES

Page 3

Labial Adhesions and Sexual Assault

Believed now to be a nonspecific finding, a review of the literature examines the possible causes.

DEPARTMENTS

From the President2

From the Editor2

Book Review6

Research Briefs7

Regional News8

England • Germany • Japan • Mexico • Canada • Australia
Brazil • Netherlands • Sweden • South Africa • New Zealand
Israel • New Zealand • Ireland • Singapore • Congo • Serbia
Wales • United Kingdom • USA • England • Germany • Japan
Sweden • Netherlands • Sweden • South Africa • New Zealand
Ireland • USA • England • Germany • Japan • Mexico • Canada • Australia
Canada • Australia • Brazil • Netherlands • Sweden • South Africa • New Zealand
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From the President



Daniel Sheridan

We would like to report on the strategic planning meeting held by the members of the Board of Directors in March. Many changes will occur this year as a result of IAFN's move to self-management, so the Board felt it would be an excellent time to re-examine the association's mission and goals. As a result of our 2-day meeting in Baltimore, we have approved the following Mission Statement and Organizational Goals:

IAFN Mission and Vision Statement

"The mission of the IAFN is to provide leadership in forensic nursing practice by developing, promoting, and disseminating information internationally about forensic nursing science."

IAFN Organizational Goals

- To incorporate primary prevention strategies into our work at every level in an attempt to create a world without violence.
- To establish and improve standards of evidence-based forensic nursing practice.
- To promote and encourage the exchange of ideas and transmission of developing knowledge among its mem-

bers and related disciplines.

- To establish standards of ethical conduct for forensic nurses.
- To create and facilitate global educational opportunities for forensic nurses and related disciplines.

In addition to setting new goals the Board also made the commitment to work together to make IAFN a truly international organization. Using the 14th Annual Scientific Assembly as a focus, we hope to highlight the many international efforts of forensic nurses. Our international keynote speakers include Dr. Mireille Kingma, consultant with the Nursing and Health Policy, International Council of Nurses, who is speaking on workplace violence; and Jim Welsh from Amnesty International. We will also have presenters from Australia, Canada, Italy, Sweden, and the United Kingdom.

This year we will expand our Board of Directors to include a second designated international member and we hope additional international members will apply for positions throughout the Board. We challenge each member to think and speak about forensic nursing in international terms, and hope those of you who come to Vancouver will make an effort to build some new collaborative relationships with international partners. We appreciate the work by our Canadian members and the rest of the assembly planning committee to make this an exceptional opportunity for our members to learn and share new ideas and information.

We also want to take this opportunity to let you know that the Board wants to be responsive to IAFN members' needs. We hope the new Web site will allow us to share information quickly and more completely with our members. Please know we are always willing to listen to your concerns. We hope to see every one of you in Vancouver.

From the Editor



Lynda D. Benak

"Excellence is a point of view..."

Never a truer statement was made. Recently I found this in a health care insurance advertisement and thought how appropriate it was for any professional climate. In my current role as a forensic nurse and clinical risk manager, excellence does not have an endpoint – but rather, is a constant variable based

on how we practice our craft. Interestingly, excellence is a marketable asset, one that must be monitored to be maintained.

Why the focus on excellence?

I personally believe the International Association of Forensic Nurses is setting a pace that sets our work apart – an excellence in nursing practice that is unique, with a special focus on practice areas that many still fail to accept as within the realm of their professional responsibility – the forensic aspects of health care.

We have achieved a level of excellence based on the direction and development we have established within the organization, combined with the worldwide recognition we now enjoy.

Over the past several years, our efforts have been recognized in Washington, DC, affecting legislation; international educators have brought forensic nursing tools to those who would otherwise not have the necessary support to promote growth in regional health care; students have found (and continue to find) a renewed interest in nursing with a forensic focus; and educational institutions have finally realized the importance of adding forensic nursing education to their standard nursing curriculum. These are only a few of the

continued on page 14

Labial Adhesions as a Sexual Assault Finding

Kathy E. Gill-Hopple, MSN, ARNP, SANE-A



Labial adhesions have been documented as a finding associated with sexual abuse and as an isolated finding in girls between the ages of 3 months and 6 years (Bacon, 2002; Leung, 1993; McCann, Voris & Simon, 1992; Muram, 1989). To clarify the significance of labial adhesions with pediatric sexual abuse, a brief literature review in CINAHL was conducted, using the terms “labial adhesion,” “sexual abuse,” and “sexual assault.”

Research literature indicates that young girls can have labial adhesions with no suspected or verbalized history of sexual abuse, as well as when abuse has been documented (Adams, Harper, Knudson & Revilla, 1994; Bacon, 2002; Ben-Ami, Boichis, & Hertz, 1978; Berenson, Heger, Hayes, Bailey, & Emans, 1992; Berkowitz, Elvik, & Logan, 1987; Heppenstall-Heger, McConnell, Ticson, Guerra, Lister, & Zaragoza, 2003; Kellogg, Para, & Menard, 1998; Leung, Robson, & Tay-Uyboco, 1993; McCann, Wells, Simon & Voris, 1990; Papagianni & Stanhope, 2003).

Labial adhesions have also been called agglutination, fused labia, synechiae, and vulvar fusion (Ben-Ami et al., 1978; Berkowitz et al., 1987; Berenson et al., 1992; Kellogg et al., 1998; Sinha, Ojha, Samujh, & Rao, 2005). Defined as the partial or complete adherence of the labia minora, labial adhesions can appear as an avascular, thin, pale, translucent streak in the midline that obscures or partially obscures vaginal introitus (Leung et al., 1993; Muram, 1999).

The etiology of labial adhesions is unknown, but they are believed to be related to a low estrogen level, local inflammation, irritation, or a dermatologic condition (Aribarg, 1975; Pokorny, 1992; Leung et al 1993; Muram, 1999; DeCherney & Pernoll, 1994). The skin covering the labia minora is thin and can be denuded as a result of inflammation or irritation. As the edges of each side of the labia renew the epithelial layer, the sides can fuse in the midline. Papagianni & Stanhope (2003) describe a case of premature teacher in a 2-year-old girl. As well as a partial labial adhesion, this patient had unilateral breast enlargement to Tanner stage 2. While no concern related to sexual assault was noted, the patient did have a 7-month history of vaginal itchiness and an elevated serum estradiol for her age. This case supports the theory that labial adhesions may

be a result of some other mechanism besides estrogen insufficiency.

Relationship to Sexual Assault

Labial adhesions are considered a nonspecific finding in the guidelines set forth by Joyce Adams (Adams, 2006, 2001; Kellogg et al., 1994). Labial adhesions may often be the result of medical conditions rather than sexual assault. While the association of labial adhesions and sexual assault is ambiguous, it appears that labial adhesions may be more prevalent in a population evaluated for sexual assault. Whether this is due to the likelihood of documenting labial adhesions findings when a complete genital exam is done, as opposed to a well-child checkup that may not include a complete genital exam, is unknown.

Berkowitz, Elvick, & Logan (1987) completed a retrospective review of 375 females (ages 2 months to 5 years) referred to a pediatric clinic for sexual abuse evaluation by law enforcement, social service, physicians and/or psychologists. Ten cases of labial adhesions were documented in patients who had no history of genital trauma other than the concern related to sexual assault. A complete adhesion, leaving just a small anterior opening, was seen in seven of the girls (ages 12 months to 5 years). One patient with a

complete adhesion (age 2) who gave a history of sexual assault had no physical findings consistent with sexual assault.

One would assume if the adhesion were complete it would be impossible to visualize the hymen, which the authors documented as “normal.” Five other patients with

either partial or complete adhesions had abnormal anal exam findings, including lax anal tone, presence of a perianal tag (both are no longer considered positive for sexual abuse), and external anal sphincter transaction. Only one of the patients (age 4) had an abnormal hymen exam (Berkowitz et al., 1987). The hymen was not visualized in five of the patients, four of whom had complete adhesions and one with a partial adhesion. One of the patients with a complete adhesion (age 12 months) tested positive for gonorrhea.

Muram (1989) reported a prospective study of 205 girls (ages 1-10 years) referred for sexual abuse examination. Nonspecific findings were reported for 45 (22%) girls. In addition to labial adhesions, redness of the external genitalia, purulent vaginal discharge, increased vestibular and labial vascularity, small skin fissures, and lacerations of the posterior fourchette were considered nonspecific findings. Of these

Labial adhesions are considered a nonspecific finding in the guidelines set forth by Joyce Adams.

girls, eight had a labial adhesion as an isolated finding and one had a labial adhesion with redness and irritation. Findings considered specific for sexual abuse (hymen lacerations, vaginal mucosa lacerations, enlarged hymenal opening, and bite marks) were present in 93 girls. Two of the cases with labial adhesion also had a hymenal laceration and an STI; the other two cases with labial adhesion in the specific-for-abuse category had a hymenal laceration and redness and irritation (Muram, 1989).

McCann, Voris, & Simon (1988) described the cases of six siblings, each with a labial adhesion (ages 4, 5, 6, 7, 8, and 9), who were removed from their parents' home by Child Protective Services. Initially none of the girls had a history of sexual assault and were placed into protective services due to poor hygiene and neglect of other medical conditions. After they were removed from the home, four of the girls disclosed sexual abuse by family members, and confessions were obtained. The authors considered the appearance of labial adhesions in all of the girls as remarkable, since few other cases of adhesions in siblings had been noted.

Another case of labial adhesion was documented by McCann, Voris, and Simon (1992) reported in a 9-year-old girl sexually assaulted by a stranger. On the day of the assault, a cursory examination in the emergency department showed 'multiple hymenal lacerations' and bruising, and a laceration in the fossa navicularis extending through the posterior vaginal wall. Although a gynecology consult was made, no surgery was performed. Three days later a colposcopic exam documented a 5 mm long labial adhesion, erythema, and edema of the hymen. It is unknown whether the adhesion was present prior to the assault (McCann et al., 1992).

Adams et al. (1994) reviewed 213 female sexual assault patients (ages 8 months to 17.11 years) whose perpetrator had either confessed, pled guilty, or been convicted in court. Of these patients, 104 (49%) had only nonspecific findings, with 37 (17%) having labial adhesions. It was not reported how many cases of labial adhesion were present in the remaining 46 cases with suspicious, suggestive, or clear findings of injury due to sexual assault (Adams et al., 1994).

Kellogg et al. (1998) reported on 151 girls (ages 2 months to 16.8 years) with sexual assault referrals from law enforcement agencies, child protective services, medical clinics, day care providers, and attorneys. None of the girls divulged a history of sexual abuse at the time of the examination. Criteria for inclusion in the study was the presence of abnormal genital findings, anogenital bleeding or bruising, anogenital irritation or redness, vaginal discharge, anogenital lesions, and unusual urinary symptoms.

Abnormal genital examination findings were present in 38 cases, however labial adhesion was not listed as a component of abnormal genital findings (signs and symptoms of enlarged vaginal or hymenal opening, scarring, and anal dilatation. Using the first Adams Classification System

Etiology is unknown, but labial adhesions are believed to be related to a low estrogen level, local inflammation, irritation, or a dermatologic condition.

(Adams, Harper, & Knudson, 1992) cases were classified according to physical examination findings that were consistent for "no abuse," "possible abuse," "probable abuse," or "definitive for abuse" (Kellogg et al., 1998). Seventy patients had nonspecific findings or a diagnosis other than sexual abuse. Of these, seven girls (10%) were diagnosed with labial adhesion. The frequency of labial adhesions among cases consistent for possible, probable, or definitive abuse was not reported (Kellogg et al 1998).

Hegar, Ticson, Velasquez, & Bernier (2002) reviewed records of 1,963 girls examined for possible sexual abuse. Labial adhesion was not included as a component in the authors' definition of 'abnormal,' or 'nonspecific' exam findings. The majority (96.3%) had normal examinations and no cases of labial adhesions were documented (Hegar et al., 2002). In the Heppenstall-Heger et al. (2003) study of genital healing after ano-genital trauma, 35 out of 75 girls with a history of 'vaginal penetration or trauma' exhibited fossa navicularis and/or posterior fourchette tears. Two of these girls (5.7%) healed with labial adhesions. It is unknown whether the two with labial adhesions were victims of sexual assault or an accidental trauma.

Treatment

The treatment of choice for labial adhesion is topical estrogen therapy, applied to the fused labia (Muram, 2000). When adhesion is accompanied by urologic symptoms, recommendations call for either manual separation in the office or surgical separation with general anesthesia (Sinha et al., 2005; Bacon, 2002; Jamieson & Ashbury, 1999; Nurzia, Eickhorst, Ankem, & Barone, 2003). Topical therapy has demonstrated adequate results for most patients. In the Berkowitz et al. (1987) study, 66% of the patients treated with topical estrogen experienced resolution. Three patients experienced breast hypertrophy which caused the treatment to be stopped, and two did not return for follow up. None of the patients had resolution of the adhesion without treatment, and only one patient experienced re-fusion after completing treatment. Sequelae related to estrogen treatment of adhesions includes premature thelarche.

Conclusion

Females who have not been sexually abused (met pre-defined behavioral, physical, and emotional screening criteria) have shown evidence of labial adhesion (McCann et al., 1990). Young children who may have been exposed to sexual assault may be diagnosed with labial adhesion. Whether this is related to the abuse or simply discovered during the detailed genital examination is unknown.

Awareness of the possibility of sexual abuse is important to maintain in any pediatric or family practice setting where these patients may be seen. However, it is important to recognize that labial adhesions are not a diagnostic finding.

The results of earlier research, limited by the knowledge and understanding of sexual assault at that time, proves that simply the presence of labial adhesions is inconclusive of positive sexual assault history. The Berkowitz et al. (1987) study of 10 labial adhesion cases used what is now considered an outdated definition of physical findings consistent with sexual abuse and is limited by inaccuracies in the findings table and results section. Such problems make it difficult to draw reliable conclusions from this article.

Labial adhesions have been documented nonspecific – as well as specific – for abuse cases (Berenson, et al., 1992; McCann et al., 1990; Muram, 1989). Out of 205 cases, 93 were classified as having findings considered specific for abuse. All cases with labial adhesion also had hymenal or vaginal wall lacerations (Muram, 1989). Muram (1989) considered an enlarged hymenal opening a finding specific for sexual abuse; however this has also been eliminated from the Adams Classification System (Adams, 2001).

Incomplete examination techniques limit evaluation of potential labial adhesion, as in the 9-year-old victim of sexual assault documented by McCann, Voris, & Simon (1992). The only colposcopic examination conducted post-assault occurred 3 days later and documented the labial adhesion, while the first ED exam on the day of the assault did not address whether or not a labial adhesion was present.

It is important for the health care provider to investigate the possibility of sexual abuse exposure when a labial adhesion is discovered in a prepubescent female. The adhesion itself may make a complete genital examination difficult, due to obscuring of the genitalia. In many cases resolution can be obtained without invasive treatment.

After resolution a complete genital exam should take place. At this time it would be ideal to educate the parent and/or caregiver on appropriate care of the genitalia to hopefully avoid future recurrences, although this is not always possible. Labial adhesions resolve spontaneously with puberty, as endogenous estrogen levels rise. It is also wise to educate parents and/or caregivers about normal female genitalia, and take the opportunity to dispel myths associated with the phrase ‘an intact hymen.’

References

- Adams, J.A., Harper, K., Knudson, S., & Revilla, J. (1994). Examination findings in legally confirmed child sexual abuse: It's normal to be normal. *Pediatrics*, 94(3), 310-317.
- Adams, J.A., Harper, K., & Knudson, S., (1992). A proposed system for the classification of anogenital findings in children with suspected sexual abuse. *Adolescent & Pediatric Gynecology*, 5, 73-75.
- Adams, J.A. (2001). Evolution of a classification scale: Medical evaluation of suspected child sexual abuse. *Child Maltreatment*, 6(1), 31-36.
- Aribarg, A. (1975). Topical oestrogen therapy for labial adhesions in children. *British Journal of Obstetrics and Gynecology*, 82, 424-425.
- Bacon, J.L. (2002). Prepubertal labial adhesions: Evaluation of a referral population. *American Journal of Obstetrics and Gynecology*, 187(2), 327-332.
- Ben-Ami, T., Boichis, H., & Hertz, M. (1978). Fused labia. *Pediatric Radiology*, 7, 33-35.
- Berenson, A.B., Heger, A.H., Hayes, J.M., Bailey, R.K., & Emans, S.J. (1992). Appearance of the hymen in prepubertal girls. *Pediatrics*, 89(3), 387-394.
- Berenson, A.B., Chacko, M.R., Wiemann, C.M., Mishaw, C.O., Friedrich, W.N., & Grady, J.J. (2000). A case-control study of anatomic changes resulting from sexual abuse. *American Journal of Obstetrics and Gynecology*, 182(4), 820-831.
- Berkowitz, C.D., Elvick, S.L., & Logan, M.K. (1987). Labial fusion in prepubescent girls: A marker for sexual abuse? *American Journal of Obstetrics and Gynecology*, 156(1), 16-20.
- DeCherney, A.H., & Pernoll, M.L. (1994). *Current Obstetrics & Gynecologic Diagnosis & Treatment* (8th ed.). Appleton & Lange: Norwalk, CT.
- Heger, A., Ticson, L., Velasquez, O., & Bernier, R. (2002). Children referred for possible sexual abuse: Medical findings in 2,384 children. *Child Abuse & Neglect*, 26, 645-659.
- Heppenstall-Heger, A., McConnell, G., Ticson, L., Guerra, L., Lister, J., & Zaragoza, T. (2003). Healing patterns in anogenital injuries: A longitudinal study of injuries associated with sexual abuse, accidental injuries, or genital surgery in the preadolescent child. *Pediatrics*, 112(4), 829-837.
- Leung, A.K.C., Robson, W.L.M., & Tay-Uyboco, J. (1993). The incidence of labial fusion in children. *Journal of Pediatric and Child Health*, 29, 235-236.
- Jamieson, M.A., & Ashbury, T. (1999). Flavored midazolam elixir for manual separation of labial adhesions in the office. *Journal of Pediatric and Adolescent Gynecology*, 12, 106-107.
- Kellogg, N.D. Parra, J.M., & Menard, S. (1998). Children with anogenital symptoms and signs referred for sexual abuse evaluations. *Archives of Pediatric and Adolescent Medicine*, 152, 634-641.
- McCann, J., & Voris, J. (1993). Perianal injuries resulting from sexual abuse: A longitudinal study. *Pediatrics*, 91(2), 390-393.
- McCann, J., Voris, J., & Simon, M. (1992). Genital injuries resulting from sexual abuse: A longitudinal study. *Pediatrics*, 89(2), 307-310.
- McCann, J., Wells, R., Simon, M., & Voris, J. (1990). Genital findings in prepubertal girls selected for nonabuse: A descriptive study. *Pediatrics*, 86(3), 428-439.
- Muram, D. (1989). Child sexual abuse-genital tract findings in prepubertal girls. The unaided examination. *American Journal of Obstetrics and Gynecology*, 160(2), 328-333.
- Muram, D. (1999). Treatment of prepubertal girls with labial adhesions. *Journal of Pediatric & Adolescent Gynecology*, 12, 67-70.
- Muram, D. (2000). Management of labial adhesions in prepubertal girls. *Journal of Pediatric & Adolescent Gynecology*, 13, 183-186.
- Nurzia, M.J., Eickhorst, K.M., Ankem, M.K., & Barone, J.G. (2003). The surgical treatment of labial adhesions in pre-pubertal girls. *Journal of Pediatric & Adolescent Gynecology*, 16, 21-23.
- Papagianni, M., & Stanhope, R. (2003). Labial adhesions in a girl with isolated premature thelarche: The importance of estrogenization. *Journal of Pediatric & Adolescent Gynecology*, 16, 31-32.
- Pokorny, S.F. (1992). Prepubertal vulvovaginitis. *Obstetrics and Gynecology Clinics of North America*, 19(1), 39-58.
- Sinha, A., Ojha, S., Samujh, R., & Rao, K. (2005). Labial adhesions: Facts and fiction. *The Indian Journal of Pediatrics*, 72(4), 365-366.

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Editor's note: For an additional resource and related article, see “Approach to the Interpretation of Medical and Laboratory Findings in Suspected Child Sexual Abuse: A 2005 Revision,” by Joyce A. Adams, MD. *On The Edge*, Volume 12, Number 1, Spring 2006, pages 5-11.

Book Review



Reviewed by Patricia A. Crane, PhD, MSN, RNC

Forensic Nursing: A Handbook for Practice

By Rita Hammer, Barbara Moynihan,
& Elaine M. Pagliaro

Retail Price \$99.95 • Hardcover • 900 pages

Jones & Bartlett Publishers

ISBN: 0763726109 • © 2005

How could forensic nurses be so lucky as to have two nursing textbooks published this past year? The diverse and comprehensive text, *Forensic Nursing: A Handbook for Practice*, contains 27 chapters in five topical sections. Content experts explore basic information in addition to presenting expanded application of forensic nursing knowledge.

Senator Joseph Biden (D-DE), in his forward, refers to forensic nurses as the foot soldiers responding to violence. The foot soldiers will be armed with skill and experience, and forensic nurse educators will be equipped with tools to expand and stimulate the learning experiences that they provide.

Following each chapter, there are appropriate content-based questions that propose intriguing dialogue suitable for advancing the critical thinking of the experienced or novice forensic nursing practitioner.

Topical issues are addressed that prepare the next generation of forensic nurses. A comprehensive overview of forensic issues is presented that will enhance the nursing knowledge used in the skilled and holistic management of forensic patients.

Five sections of the book include various chapters that address specific issues that affect practice roles. Part one presents the foundations of forensic nursing and includes the background, history, and role development of the specialty. In addition, the current state of practice and vision for the future are presented. The basis of practice is presented with an array of topics. Theoretical perspectives and concepts critical to theory development in forensic nursing are explicated. Chapters address multiple aspects of forensic nursing, such as the epidemiology of violence, the significance of collaboration with other disciplines, and patient diversity. Ethical principles and considerations are delineated, and the final chapter in this section presents a thorough overview of America's criminal justice system.

Part two includes the multiple vulnerable populations who may be cared for in forensic practices, such as intimate partners; children and youth; covering such areas as youth

exposure to violence and sudden death; arson, and post-traumatic distress. The chapters address violence and forensic issues from the psychological to the physical aspects in a manner that is appealing and understandable to those in various practice settings.

Part three, which covers practical aspects in forensic practice, outlines concepts and skill sets that may be appreciated in a variety of forensic nursing roles. Death investigation, evidence collection, photographic documentation of evidence, and forensic physical examinations are considered the basic competency skills in forensic nursing. In addition, the significance and importance of DNA and computer-assisted crime are detailed in the final chapters of the section.

Part four outlines the responsibilities and challenges inherent in several forensic nursing roles not incorporated into other chapters. Chapters on correctional nursing, expert witness testimony, and disaster and emergency management indicate the unique responsibilities and ramifications of the roles.

Finally, part five looks at more innovative and newer concepts and interests that affect forensic practice in the 21st century. It also explores the management of the media, leadership, public and health care policy, and nursing education.

The final section of the book outlines the direction forensic practice must go to enrich its future and secure its place in the health care and legal arenas.

The past, present, and future of forensic nursing are explored in the book with several useful assessment tools in the appendices as well as resources and educational programs. The truly comprehensive and professional presentation

includes many aspects of forensic nursing that have not been seen in print thus far.

If there would be any limitation to the book it would be the absence of a chapter on research. Research on medical-legal issues comes from many other professions such as psychology, psychiatry, sociology, human behavior, criminal justice, and others. However, the past few years have seen increasing opportunities for nurses at all levels participating in research that is exploratory and descriptive as well as quantitative and outcome-based. Nurses are beginning to develop their databases, investigate their patient populations, and produce evidence-based research that can influence practice.

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Research Briefs



Barbara Girardin, PhD, MSN, RN
Column Editor

Odontology

DeValck, E. (2006, May 15). Major incident response: Collecting ante-mortem data. *Forensic Science International*, 159(Suppl: S15-19).

This study from Belgium evaluated disaster victim identification (DVI).

Following the Asian tsunami December 26, 2004, 200,000 casualties occurred in 10 countries. Those casualties needed to be identified. There had to be a standard operating protocol of postmortem procedures due to the number of bodies, their degree of decomposition, and the limited number of DVI teams from 20 countries that were involved in the identifications. Fingerprinting, forensic pathology, forensic odontology, and DNA profiling were key components of the identification process. However antemortem dental data of the people reported missing in their home countries was crucial to identification in up to 85% of the cases.

Procedures were developed to describe who, where, when, and what information had to be collected by the dentists on the antemortem teams. Then transcribing the antemortem dental information by experienced forensic odontologists was another crucial element in the identification procedure because the antemortem information had to be loaded into the DVI system for comparison with post-mortem data.

Implications

International cooperation, standard practice, and adequate funding were all necessary in responding effectively. The experience of forensic odontologists was invaluable in the identification of these disaster victims.

Trace DNA

Petricevic, S.F., Bright, J.A., & Cockerton, S.L. (2006, May 25). DNA profiling of trace DNA recovered from bedding. *Forensic Science International*, 159(1), 21-26.

This study from the Institute of Environmental Science in New Zealand considered the transfer of trace DNA to bedding via when the bed is slept in normally.

Volunteers slept one night on a new, lower bed sheet in their own bed and one night in a bed that was foreign to them. Samples from the sheets were collected and analyzed by DNA profiling. The results indicate that the DNA profile of an individual can be obtained from bedding after one night of sleep. The DNA profile of the owner of the bed could also be detected in the foreign bed experiments.

Implications

The usefulness of bedding in obtaining DNA profiles should not be under-rated. SANEs should determine from the victim what surface the incident occurred on and whether sheets, blankets, or other linens were in contact

with the victim and assailant. Then, the SANE may consult with the detective to ensure that the detective retrieves the necessary linens.

Forensic Psychiatry

Fioritti, A., Ferriani, E., Rucci, P., & Melega V. (2006). Characteristics of homicide perpetrators among Italian forensic hospital inmates. *International Journal of Law and Psychiatry*, 29(3), 212-219.

This study describes the clinical and social features of the psychiatric patients who committed homicide among inmates of Italian forensic hospitals. There were four groups compared: 64 inmates who committed or attempted homicide (Hs), their 64 matched controls from community services caseloads; and 54 inmates who committed other crimes and their 54 matched controls.

Inmates who committed or attempted homicide showed less severe psychopathology, later contact with mental health services, lower disability scores, except for "hostility" and "suspiciousness" factors. They showed better pre-morbid adjustment (SES and employment). They had a better behavioral profile (fewer compulsory admissions, fewer previous criminal records, less substance abuse, and less frequency in the caseloads of community services).

Implications

Italian inmates who attempted or committed homicide have characteristics that are far from the stereotype of the violent and dangerous psychiatric patient. Routine risk assessment procedures may not detect homicidal behavior. New homicide-specific tools need to be developed and tested.

Offender Recidivism

Vandiver, D.M. (2006, May). A prospective analysis of juvenile male sex offenders: Characteristics and recidivism rates as adults. *Journal of Interpersonal Violence*, 21(5), 6673-6688.

This research from Illinois State University describes the recidivism rates of a sample of 300 registered male sex offenders who were juveniles at the time of their initial arrest for a sex offense. The offenders were followed for 3-6 years after adulthood and recidivism was evaluated as adults.

The typical juvenile is a 15-year old White male who was arrested for sexual assault or indecency with a child. The majority of victims are females age 8. Although only 13 are re-arrested during the follow-up period for a sex offense, more than half of the sample is arrested at least once for a nonsexual offense.

Implications

Victim age, offender age, and victim gender are significant predictors of recidivism during adulthood. Corrections staff should continue to seek improved techniques for reducing recidivism, based on the characteristics of the offender.

The Research Briefs column is an opportunity for IAFN members to submit abstracts or articles of interest on past, current, or future research. Please send your submission to the Editor, On The Edge (see back cover).

Regional News



SOUTHERN CALIFORNIA

Submitted by Cari Caruso, RN, SANE-A

Jeannie Stephenson, manager of the California Hospital Medical Center SANE Program, was honored at the Crystal Room of the Millennium Biltmore Hotel, by the Los Angeles County Board of Supervisors and the Los Angeles County Commission for Women, on March 13, 2006, at the 21st Annual Woman of the Year Awards Luncheon.

The award is bestowed upon women who have made a difference in the lives of women in Los Angeles. Jeannie has long been a highly respected role model and generous spirit in our community. We are proud to know this outstanding colleague and offer our congratulations for this well-deserved honor.

California Sexual Assault Investigators Association (CSAIA) will hold its Fall Conference October 24-27, 2006, at the San Francisco Marriott. To find out more about the conference, check their Web site, www.csaia.org, for updates.

The 11th International Conference on Violence and Trauma (formerly the International Conference on Family Violence), conducted by the Institute on Violence, Abuse and Trauma, will be held September 14-19, 2006, in San Diego, CA. For more information, contact Jacqueline Manley, Conference Coordinator (858) 623-2777 ext. 427; e-mail: fvconf@alliant.edu.

The University of California Riverside, Extension, offers forensic nursing courses on an on-going basis on-line, including Sexual Assault Examiner Training. Visit <http://www.unex.ucr.edu/sciences/hc/sae/index.html>.

The University of California, San Diego, Extension, will be offering courses in forensic nursing, family violence, and a pediatric sexual assault examiner class. The Forensic Nurse Examiner Course will be offered from September 11-15, 2006. For more information contact UCSD Extension Phone: (858) 964-1010 or (800) 711-5030 www.extension.ucsd.edu/health-care.

Don't forget to visit the IAFN Web site, www.iafn.org, regularly to see what's new and to check for upcoming events and educational opportunities.

Keep the communication lines open and feel free to contact me for any contributions you would like to make for the next issue of *On The Edge*. I can be reached at (626) 796-3312 or via e-mail at fnpi@sbcglobal.net. Until next time...

CONNECTICUT

Submitted by Connie Weiskopf, PhD, APRN

The IAFN CT chapter developed and sponsored a bill to require acute care hospitals to provide forensic nursing services to victims of physical or sexual assaults. The bill was presented before members of the CT General Assembly Public Health Committee. The CT chapter presented testimony, as did other supporters, including Quinnipiac University faculty. While the bill did not make it out of the committee, there was great support from CT Senator Murphy and CT Representative Sayers. The chapter is encouraged that requiring hospitals to provide training for nursing staff on collecting and preserving evidence to ensure proper forensic care for all victims of abuse or trauma may become a reality next year.

The 5th Annual CT IAFN Conference was held April 4, 2006, at the CT Forensic Laboratory in Meriden CT. The conference title "Forensic 5: Interpersonal Violence, Elder Abuse, Sexual Assault, Death Investigation, and Child Abuse" was chosen to celebrate and acknowledge the chapter's 5 year anniversary.

Nancy Cabelus, CT chapter board member, and IAFN Director at Large has been working as a forensic nurse consultant in Bogotá, Columbia. At Nancy's invitation, a Columbian delegation representing a variety of medico-legal disciplines attended this conference to learn first-hand about forensic nursing practice in the United States. Conference presentations were conducted by chapter members Nancy Cabelus, Jennifer Hiscoe, Patti LaMonica, Barbra Moynihan and Shery Watson. The CT Nurse's Association awarded nursing continuing education credit of 4 contact hours and attendance was "standing room only!"

If you would like to submit something to the next issue of *On The Edge*, please contact me (860) 679-5518; or weiskopf@adp.uchc.edu.

Forensic Nursing:
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Submit an article to *On The Edge*.
For deadlines and submission information,
see page 15.

Strangulation

continued from page 1

A review of 300 survivors of strangulation demonstrates that 97% were manual and 3% were by ligature (Strack, McClane, Hawley, 2001). Few survivors seek medical care despite injuries visible to family and friends (Funk, Schuppel, 2002; Smith, Mills, Taliaferro, 2001; Strack et al., 2001).

Distinguishing between choking and strangulation is critical. Strangulation is defined as “a form of asphyxia characterized by closure of the blood vessels or air passages of the neck as a result of external pressure on the neck” (McClane et al., 2001, p. 311). Choking is more ambiguous; it can refer to the act of strangulation or aspiration of an object such as a piece of candy. This distinction has medicolegal implications and the violent act should be specifically addressed as “strangulation” (McClane et al. 2001; Hawley, 2002).

Police officers no longer use the “carotid restraint hold,” or choke hold, to subdue suspects as it has been discovered that death can ensue without the intent of the officer and without leaving external marks on the body (see Figure 1, page 1). In this hold, the arm is bent at the elbow and pressure is exerted on the anterior neck, compressing the carotid arteries and veins (Hawley, 2002; Funk, Schuppel, 2003; McClane et al., 2001, Spitz, 1993). The United States Army trains “close-range combatives” to use strangulation as a method of lethal force (Strack et al., 2001).

A review of 300 cases of strangulation survivors submitted to the San Diego City Attorney’s Office was conducted to determine the signs and symptoms that could be used to corroborate the victims’ allegations for purposes of prosecution. This study was performed by Gael B. Strack, JD, a San Diego attorney. Of these cases, 50% had no visible markings to the neck and 35% had minor injuries. This was an extensive study that revealed the seriousness of strangulation; however, there are few similar studies available. Police and prosecutors overlooked symptoms and focused on visible injuries to prove strangulation. The study demonstrated the lack of documentation and the need for medical training for law enforcement on strangulation (Strack et al., 2001). Further studies are needed to determine other signs and symptoms of strangulation.

Numerous cases have been documented in which victims have been strangled and lived, but later died from progressive causes (McClane et al., 2001). Delayed death may be from airway obstruction due to bleeding or edema of underlying tissues in the neck (Funk & Schuppel, 2003; Spitz, 1993). Anoxic encephalopathy may result in delayed death due to brain cell death (Hawley, McClane, & Strack, 2001). Injury or dissection of the carotid artery may lead to cerebrovascular accidents within 2 weeks after strangulation (Wilbur et al., 2001).

Mechanisms Involved

There are four mechanisms involved in injury resulting from strangulation. First, cardiac arrhythmia may result from pressure on the carotid artery nerve ganglion, causing cardiac arrest. This is suspected to be uncommon since force must be applied over a very localized and specific anatomic area. Second, pressure on the carotid arteries can obstruct blood flow to the brain. Third, pressure on the jugular veins prevents venous blood return from the brain, gradually backing up the blood causing stagnant hypoxia and resulting in unconsciousness, depressed respiratory effort, and asphyxia. The fourth mechanism is pressure obstructing the larynx, cutting off airflow to the lungs and resulting in asphyxia (Hawley, 2002, Hawley et al., 2001, Wilbur et al., 2001).

Only 11 pounds of pressure on both carotid arteries for 10 seconds will result in loss of consciousness (see Figure 2, page 1). If pressure is immediately released, consciousness may be regained in 10 seconds. Only 4 pounds of pressure is required to obstruct the jugular veins. To completely close off the trachea, 33 pounds of pressure is necessary. The amount of force, however, varies tremendously depending on the size

of the victim and perpetrator, as well as the surface area on which force is applied. A small woman can easily strangle a large man. The victim will first experience severe pain, and then mammalian instincts will lead to a vigorous struggle to preserve life. Continuing pressure will cause loss of consciousness followed by brain death (Baden, 2003, Hawley et al., 2001, Hawley, 2002; Funk & Schuppel, 2003; McClane et al., 2001).

Clinical Presentation

Specific injuries depend on the method of strangulation used along with the force and duration of the episode. Circular or oval contusions on the neck caused by the fingertips of the assailant’s grasp may be visible. Singular thumb impressions are more commonly found as the thumb causes more pressure than other fingers. Superficial curvilinear abrasions are usually the result of the victim’s struggle to pry the assailant’s hands off his or her neck (Olshaker, Jackson, & Smock, 2001). Ligature abrasions are horizontal about the neck and are distinguished from the ligature marks left by suicidal hanging where the ligature furrow rises toward one ear (Hawley et al., 2001; Hawley, 2002). Edema of the neck area may result from internal hemorrhage, injury to underlying structures, or subcutaneous emphysema from trauma to the larynx (Funk & Schuppel, 2003).

Petechiae are nonspecific findings caused by a variety of mechanisms leading to asphyxia including strangulation, drowning, sudden infant death syndrome, aspiration of gastric contents, drug intoxication, and hanging, along with some natural causes. Petechiae do not prove strangulation and their absence does not disprove it; they are simply a marker of increased cephalic venous pressure (Ely & Hirsch, 2000; Hawley et al., 2001; Hawley, 2002). Petechiae

Distinguishing
between choking
and strangulation is
critical.

may be present on the neck, external ear canal, face, periorbital regions, under the eyelids or on the scalp. Subconjunctival hemorrhage may also be present (McClane et al., 2001).

Voice changes may be minimal (dysphonia) or severe (aphonia) (Funk & Schuppel, 2003). Hyperventilation may occur as a result of aspiration pneumonitis. As the victim struggles vigorously during the strangulation, air is swallowed causing inflation of the stomach. This may lead to vomiting and aspiration. Mild cases of pneumonia may occur hours or days later. During normal breathing, intrapleural pressures range from -2 to -5 cm H₂O but can increase to -100 cm H₂O with airway obstruction (Khaki, Crosbe, & Lui, 1997). Hyperventilation may be symptomatic of pulmonary edema resulting from the victim's attempt to breathe against a closed glottis (McClane et al., 2001). Difficulty or pain with swallowing is due to underlying tissue trauma and may reflect laryngeal and/or hyoid bone injury (Funk & Schuppel, 2003). Cases of adult respiratory distress syndrome have been reported in victims of strangulation (Wilbur et al., 2001).

Hyoid Bone Injuries

Hyoid bone fracture has traditionally been a well-recognized indicator of strangulation. Although hyoid bone fracture is strongly associated with strangulation, the absence of fracture does not preclude the possibility of manual strangulation. Many variables determine if a hyoid bone will fracture, including the amount of force applied to the neck, the precise position of the force, and the rigidity of the hyoid bone. The hyoid bones of children and young women are not fully ossified and therefore more pliable and resistant to fracture. Hyoid bones vary greatly in shape and rigidity (Pollanen, 2000).

Michael S. Pollanen, MD, PhD, a Canadian forensic pathologist, performed three studies of postmortem hyoid bones between 1995 and 1997. The first study, conducted by Pollanen, Bulger, and Chiasson (1995), consisted of 13 cases of manual strangulation and two cases of hanging in which the hyoid bone was fractured. Xeroradiography was used to evaluate the fractures that had been dissected from the larynx. The results showed that fractures occurred at vulnerable angles of the bone, and a curvature of 50 degrees is particularly vulnerable to fracture.

The second study, conducted by Pollanen and Chiasson (1996) compared fractured and unfractured hyoid bones from 20 victims of homicidal strangulation. Fractures occurred in older victims where the bone was more rigid, or ossified. Fractures also occurred more often in bones that were longer and more steeply sloped. Pollanen and Ubelaker (1997) then studied the dimensions and shapes of 100 hyoid bones from the Robert J. Terry Anatomical Skeletal Collection at the Smithsonian Institution. Metric parameters from these hyoid bones were compared to the parameters of hyoid bones from 10 cases of strangulation in which the

Laryngeal cartilage microfractures are the most common type of fracture among young female victims of strangulation.

hyoid was fractured. Results showed that the most intrinsic feature of the hyoid bone that determines fracture is likely the state of ossification. The bones were found to be highly polymorphic, or varied in shape, and a conclusion was made that the magnitude and position of force applied to the neck were more important variables for determining fracture than the specific shape of the hyoid bone. The first two studies were done on a small population (20 or less); however, the 100 bones exam-

ined from the Smithsonian Institution lent increased perspective on the previous studies.

Laryngeal Injuries

Pollanen also published two studies on laryngeal injuries resulting from strangulation. The first study (Pollanen & Mcauliffe, 1998), involved the cases of 12 women between ages 20-46. Nine of the 12 cases had multifocal intracartilaginous laryngeal hemorrhages, but only one had a fractured hyoid bone. The conclusion was drawn that intracartilaginous laryngeal hemorrhages "may, in fact, be the most important laryngeal injury in the neck of young female victims of strangulation since most young victims of strangulation lack either hyoid fracture or laryngeal fracture" (p. 18).

In 2000, Pollanen published a second study in which he performed histological studies of eight cases of manual strangulation. All of the cases were women with an age range of 20-50 years. This study revealed a triad of laryngeal hemorrhages described as:

1. Intracartilaginous laryngeal hemorrhage
2. Subepithelial laryngeal hemorrhage
3. Intralaryngeal muscular hemorrhage

All eight postmortem examinations revealed this pattern. Five cases also had microfractures of the laryngeal cartilage that could be directly linked to mechanical injury to the neck. Only two cases had fractured hyoid bones, which was expected as these were mostly young women who typically lack hyoid fracture (Pollanen, 2000).

Manual compression of the neck causes obstruction of laryngeal venous drainage. The congested blood vessels rupture, causing hemorrhages. This same mechanism is associated with subconjunctival petechial hemorrhages as venous drainage from the eye involves the jugular venous system. Laryngeal cartilage microfractures are the most common type of fracture among young female victims of strangulation (Pollanen, 1996, 2000). Both of Pollanen's studies were limited in size but reveal that a more careful examination of postmortem cases may reveal injury not previously detected. Further studies are needed to substantiate these injuries.

In 1998, a study of laryngeal injuries was published and included 191 cases of homicidal strangulation from 1985-1996. This was a much larger study than those previously mentioned. Helmut Maxeiner, MD, a professor of forensic medicine in Berlin, Germany, demonstrated that the usual method of laryngeal dissection might overlook important laryngeal injuries. He found that in 10% - 20% of the 191

cases there were “hidden” findings that were decisive evidence for neck compression. These findings included nondislocated cricoid fissures involving the whole width of the cartilage and the anterior fusion of the thyroid laminae, hemorrhages and muscle damage of the laryngeal muscles, and bilateral hemorrhages in the vocal cords. These are evident of traumatic injury to the neck, even if the skeletal structure is uninjured. Injuries such as these result from severe deformation of the inner laryngeal space during neck compression. In young people with elastic cartilages, these findings are frequently the only diagnostically decisive morphological result of laryngeal compression, and were found in more than half of all deaths with intensive, direct frontal pressure to the neck (Maxeiner, 1998).

Maxeiner's research is valuable in validating the severity of internal injuries incurred by strangulation victims, however further research would be necessary to strengthen his findings. Together with the research done by Pollanen, underlying injuries can be better understood. Victims of strangulation with few or no external injuries may have underlying injuries that are life threatening.

Tongue Hemorrhages

Bockholdt and Maxeiner published another study in 2002 in which they investigated 178 cases of homicidal strangulation, 20 cases of suicidal ligature strangulation, and 255 cases of suicidal hanging. This study gave a summary of the incidence and intensity of tongue bleeding found in these cases. Results showed that 25% of all homicidal strangulations had significant or massive hemorrhages of the tongue, and the most probable cause was cranial congestion. Although this study is more helpful for the postmortem investigation of death, it supports previous literature describing cranial congestion due to the compression of neck veins.

Neurologic and Psychologic Effects

Anoxic encephalopathy is the pathologic alteration of brain cells as a consequence of a decrease in blood flow to the brain (Hawley, McClane, & Strack, 2001). In strangulation, compression of the carotid arteries will cause a decrease of blood flow to the brain causing some brain cells to die early, while others may survive for days and eventually die from the delayed effects of oxygen deprivation. Nerve cell death may be patchy; nerve cells of the hippocampus, dentate nucleus and Purkinje cells of the cerebellum are more susceptible to anoxia than the cortical nerve and glial cells. Fatal anoxic encephalopathy results in brain death (Hawley, McClane, & Strack, 2001). Victims may have no visible injuries with mild symptoms, yet may die up to days or even several weeks later due to progressive, irreversible encephalopathy (McClane et al., 2001).

Carotid dissections and occlusions have also been reported. An intimal tear of the arterial wall can lead to

Victims of strangulation with few or no external injuries may have underlying injuries that are life threatening.

hemorrhage and dissection of the wall. Patients may present with pain initially, and the lesion may form as a delayed event. Carotid dissections could lead to occlusion of the artery with resulting transient ischemic event and stroke (Smith et al., 2001).

Neuropsychiatric effects of strangulation include psychosis, amnesia, cerebrovascular accident, and progressive dementia.

Behavioral changes that may manifest early and resolve include rest-

lessness and combativeness due to temporary brain anoxia or a severe stress reaction. These patients may present with a panic attack and be hyperventilating. Others may present in a detached state with a flat affect, even catatonic. Some patients have complete recall of the event while others have no memory of the event whatsoever. Dizziness, paralysis, headaches, tinnitus, sensory deficits, and loss of consciousness have been reported (Funk & Schuppel, 2003; McClane et al., 2001; Smith et al., 2001; Strack et al., 2001; Wilbur et al., 2001).

Diagnostic Evaluation

Recommendations for evaluating patients who have been strangled include pulse oximetry to measure oxygen saturation and chest x-ray to diagnose pulmonary edema, pneumonia, or aspiration. Other recommendations are nasal x-ray study for the patient presenting with hemoptysis to determine nasal fracture or soft tissue neck x-ray to evaluate for subcutaneous emphysema or tracheal deviation from edema or hematoma. Cervical spine x-ray may reveal a fractured hyoid bone and computed axial tomography (CT) scan can evaluate neck structures. A magnetic resonance imaging (MRI) scan of the neck will evaluate the soft tissues. Carotid doppler ultrasound is necessary in patients with signs of stroke. Pharyngoscopy may reveal pharyngeal petechiae, edema, or other findings, and fiberoptic laryngobronchoscopy may be necessary in evaluating the vocal cord and trachea in patients with dyspnea or voice changes (McClane et al., 2001).

Treatment

Recommendations for treatment of strangulation patients are vague except for supportive measures and observation. George McClane, MD, recommends admitting these patients to allow for continuous monitoring of their airway, breathing, and circulation along with neurologic checks. These patients also need a social service consult, as many are battered women and suffer from poor self-esteem and major depression. Progression of symptoms may warrant consultation from otolaryngology, pulmonology, or neurology (McClane et al., 2001).

Medicolegal Issues

Strangulation is more than a mere “choking” incident. As noted earlier, studies have demonstrated that even though a victim has no visible injuries, there may be inter-

Strangulation Documentation Form

Figure 3.

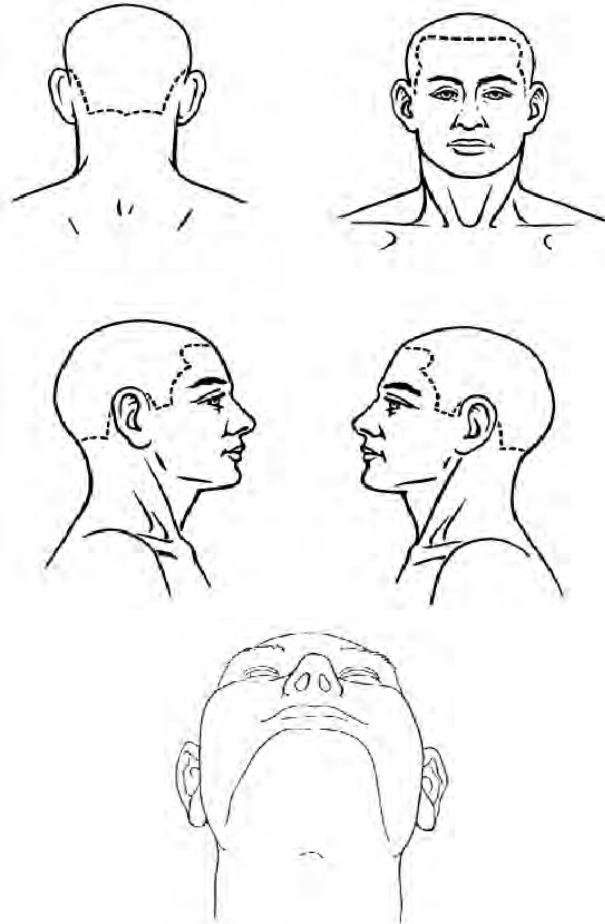
Please mark all that apply:

- ☐ Loss of consciousness
- ☐ Involuntary urination/defecation during event
- ☐ Difficulty/pain with swallowing
- ☐ Loss of memory
- ☐ Loss of voice or voice changes
- ☐ Coughing
- ☐ Drooling
- ☐ Persistent throat pain
- ☐ Breathing difficulties
- ☐ Nausea/Vomiting
- ☐ Headache

Physical Exam:

Please mark all that apply:

- ☐ Pain/tenderness
- ☐ Swelling/edema
- ☐ Coughing
- ☐ Drooling
- ☐ Loss of voice or voice changes
- ☐ Combativeness/irritability/restlessness
- ☐ Uncontrolled shaking
- ☐ Hyperventilation
- ☐ Dyspnea/apnea
- ☐ Petechiae
- ☐ Bruising
- ☐ Crepitus
- ☐ Abnormal carotid pulse



Estimated length of time strangulation occurred: _____

Number of times patient was strangled during incident: _____

Number of different methods used for strangulation during incident: _____

Method of strangulation:

- ☐ One hand
- ☐ Two hands
- ☐ Ligature (describe) _____
- ☐ Approached from front
- ☐ Approached from behind
- ☐ Other (please describe) ex. knee/foot _____

Checklist:

- ☐ Abuse Assessment
- ☐ Photograph patient demonstrating (but not physically touching) the strangulation event
- ☐ Examine scalp, eyelids, conjunctiva, chin, jaw, shoulders, and chest
- ☐ Safety plan

Description of strangling event: _____

Adapted with permission from a multi-media presentation by Dr. George McClane, emergency medicine specialist, and Assistant San Diego City Attorney Gael B. Strack. Copyright 2001, San Diego City Attorney's Office. All rights reserved.

nal injuries that are life threatening. Even in homicidal strangulation there may be few or no external signs of trauma (Spitz, 1993). It is imperative these patients receive a thorough evaluation as to the description of the event, signs, and symptoms, along with written and photodocumentation of any visible injuries. George McClane, MD, and Assistant City Attorney Gael Strack developed a strangulation documentation form for the San Diego City Attorney's Office. This tool has been adapted for use in the emergency department setting (see Figure 3).

Lethality

The lethality of strangulation may alter prosecution from a misdemeanor to felonious assault or attempted homicide under certain jurisdictions. Understanding the lethality of strangulation may help health care providers diagnose and treat these patients as well as prevent delayed deaths. It may also provide law enforcement professionals with the tools necessary to hold the perpetrators accountable for their actions. Kris Karcher, RN, Chief Deputy Medical Examiner for Coos County, OR, helped write a bill at the state level elevating strangulation to a separate crime, not just a sub-heading under the label of assault. This bill became effective in 2004, and another bill will soon be introduced to make strangulation a felony crime (Kris Karcher, personal communication, July 30, 2003).

Conclusion

Further research is needed to qualify and quantify strangulation injuries, and more educational opportunities on the dynamics of strangulation must be made available for health care providers as well as law enforcement. Only then will we be able to respond effectively to the particular needs of these victims of violence, and hold the perpetrators accountable for their actions.

References

- Baden, M. (2003, April). *Asphyxial deaths. Medicolegal investigation of death*. Symposium conducted at the Wayne State University School of Medicine, Detroit, MI.
- Bockholdt, B., & Maxeiner, H. (2002). Hemorrhages of the tongue in the postmortem diagnostics of strangulation. *Forensic Science International*, 126(3), 214-220.
- Ely, S.F., & Hirsch, C.S. (2000). Asphyxial deaths and petechiae: A review. *Journal of Forensic Science*, 45(6), 1274-1277.
- Funk, M., & Schuppel, J., (2003). Strangulation injuries. *Wisconsin Medical Journal*, 102(3), 41-45.
- Hawley, D.A., (2002, June). *Death by strangulation*. Paper presented at the conference: How to Improve Your Investigation and Prosecution of Domestic Violence and Strangulation Cases. Delaware, OH.
- Hawley, D.A., McClane, G.E., & Strack, G. (2001). A review of 300 attempted strangulation cases part III: Injuries in fatal cases. *Journal of Emergency Medicine*, 21(3), 317-322.
- Kaki, A., Crosbe, E.T., Lui, A. (1997). Airway and respiratory management following non-lethal hanging. *Canadian Journal of Anesthesia*, 44(4), 445-450.
- Maxeiner, H. (1998). "Hidden" laryngeal injuries in homicidal strangulation: How to detect and interpret these findings. *Journal of Forensic Science*, 43(4), 784-791.
- McClane, G.E., Strack, G.B., & Hawley, D. (2001). A review of 300 attempted strangulation cases part II: Clinical evaluation of the surviving victim. *Journal of Emergency Medicine*, 21(3), 311-315.

- Olshaker, J.S., Jackson, M.C., Smock, W.S. (2001). Forensic examination of victims and perpetrators of sexual assault. *Forensic Emergency Medicine* (pp. 85-117). Philadelphia, PA: Lippincott Williams & Wilkins.
- Pollanen, M.S. (2000). A triad of laryngeal hemorrhages in strangulation: A report of eight cases. *Journal of Forensic Science*, 45(3), 614-618.
- Pollanen, M.S., Bulger, B., & Chiasson, D.A. (1995). The location of hyoid fractures in strangulation revealed by Xeroradiography. *Journal of Forensic Science*, 40(2), 303-305.
- Pollanen, M.S., & Chiasson, D.A. (1996). Fracture of the hyoid bone in strangulation: comparison of fractured and unfractured hyoids from victims of strangulation. *Journal of Forensic Science*, 41(1), 110-113.
- Pollanen, M.S., & McAuliffe, D.N., (1998). Intra-cartilaginous laryngeal haemorrhages and strangulation. *Forensic Science International*, 93(1), 13-20.
- Pollanen, M.S., & Ubelaker, D.H. (1997). Forensic significance of the polymorphism of hyoid bone shape. *Journal of Forensic Science*, 42(5), 890-892.
- Smith, D.J., Mills, T., & Taliaferro, E.H. (2001). Frequency and relationship of reported symptomology in victims of intimate partner violence: The effect of multiple strangulation attacks. *Journal of Emergency Medicine*, 21(3), 323-329.
- Spitz, W.U., & Fisher, R.S. (Spitz). (1993). *Medicolegal investigation of death: Guidelines for the application of pathology to crime investigation* (pp. 444-84). Springfield, IL: Charles C. Thomas.
- Strack, G.B., McClane, G.E., & Hawley, D. (2001). A review of 300 attempted strangulation cases part I: Criminal legal issues. *Journal of Emergency Medicine*, 21(2), 303-309.
- Wilbur, L., Hugley, M., Hatfield, J., Surprenant, Z., Taliaferro, E., Smith, J., & Paolo, A., (2001). Survey results of women who have been strangled while in an abusive relationship. *Journal of Emergency Medicine*, 21(3), 297-302.



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For assistance, call the helpline:
(877) 819-SART

About IAFN's SAFE Technical Assistance Grant

Last fall, IAFN was awarded a SAFE Technical Assistance grant from the United States Department of Justice Office of Violence Against Women. The project is now operating successfully out of the IAFN home office in Arnold, MD.

Under the grant, IAFN will:

- Disseminate the National Protocol for Sexual Assault Medical Forensic Examinations of Adult and Adolescents
- Establish a 24-hour toll-free technical assistance help-line
- Launch an interactive Web site
- Provide assistance to communities who want to start or expand sexual assault response training initiatives

The help line number is 1-877-819-SART and is featured prominently on IAFN's Web site (www.iafn.org). Kim Day, RN, CFN, FNE is the new SAFE TA coordinator. She has been working at the IAFN Home Office since April and has already received over 200 requests for assistance. The help-line has

been accepting calls daily since IAFN redesigned and launched its Web site on June 2, 2006.

The estimated date of the new interactive SAFE TA Web site is mid-July 2006. Until then, Kim is assisting callers through the help-line and also via e-mail at kimday@iafn.org.



From the Editor

continued from page 2

ways we are cultivating excellence – there are many individuals who have daily impact – changing lives by simply being present and dedicated to the task at hand.

This is the second on-line issue of *On The Edge* and we are pleased to inform our readers that it has been very well received. Although some have still expressed disappointment in having only an online version, we hope over the next several months you will come to appreciate the absolute usability of the Internet as an effective tool that will only serve to enhance your work. Over the next several months, all articles published in *On The Edge* since 2000 will be conveniently indexed with associated hyperlinks allowing for quick reference to past authors and articles. The goal is to have this available by year's end – this is an exciting and necessary development, so stay tuned!

Excellence in Publication – A Special Note of Thanks

Since Fall 2000, I have had the extraordinary pleasure of working with Janet D'Alesandro, current managing editor for *On The Edge*. She exemplifies professional excellence and blessed with an infusing spirit, has been an unwavering supporter and mentor for me in my current role as editor-in-chief. Janet and I have been able to establish a mutual

respect and understanding for the seemingly insurmountable and demanding tasks surrounding publication. Each time a deadline arose, however, we met each other in the middle with a good word and heartfelt respect. The ability to laugh at ourselves has made the journey all the more special.

IAFN has transitioned to independent management, and part of that includes changes in the management of our publications. I will be assuming the managing editor role starting with the next issue and working closely with our new Web site manager, Greg Gantzer, of Gantzer Group, Inc. I am looking forward to new challenges, and will take the experience and dedication Janet has shared with me, as key in my professional toolbox. Janet, thank you – *for all you are*.

I'll close this column with an invitation to write. Your practice, case studies, research, and personal accounts have value and I hope you will consider *On The Edge* as the recipient of that information. No doubt it will have an impact for someone – somewhere, perhaps on the other side of the globe! *Share your excellence – write!*

Lynda D. Benak, MSN, RN, is Editor-in-Chief, *On The Edge*; Clinical Risk Manager, Central Maine Healthcare, Lewiston, ME; and a Forensic Nurse Specialist. She can be reached at 4n6ben@megalink.net.



ON THE EDGE

The Official Publication of the International Association of Forensic Nurses

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The International Association
of Forensic Nurses

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When you send us your article, please make sure to include your full name, credentials, professional title, name of work-place, city, and state, as we publish short biographies at the end of our features.

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