Strangulation

Presented to Monroe County Coalition Against Domestic Violence

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Forensic Nurse Examiner
Credit to My Mentor

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Pathologist, Retired

Part of the presentation slides are from his many numerous lectures
Definitions: Medical and Legal
Asphyxiation

- Venous obstruction, > cerebral stagnation > hypoxia > unconsciousness > produces loss of muscle tone and final arterial and airway obstruction
- Arterial spasm due to carotid pressure > leading to low cerebral blood flow and collapse
- Vagal collapse > caused by pressure to the carotid sinuses and increased parasympathetic tone
- Death ultimately occurs from cerebral hypoxia and ischemic neuronal death
Indiana’s Legal Definition

Strangulation
IC 35-42-2-9

Sec. 9. (a) This section does not apply to a medical procedure.
(b) As used in this section, "torso" means any part of the upper body from the collarbone to the hips.
(c) A person who, in a rude, angry, or insolent manner, knowingly or intentionally:
(1) applies pressure to the throat or neck of another person;
(2) obstructs the nose or mouth of the another person; or
(3) applies pressure to the torso of another person;
in a manner that impedes the normal breathing or the blood circulation of the other person commits strangulation, a Level 6 felony.
(d) However, the offense under subsection (c) is a Level 5 felony if:
(1) the offense is committed against a pregnant woman; and
(2) the person who committed the offense knew the victim was pregnant at the time of the offense.

Basic Information

- Definition – external force is applied to the neck that results in a depressed or completed loss of conscious (Stapczynski, 2010)
- Asphyxia - Functioning cells of the body, particularly the brain – deprived of oxygen
- External force – Hands (manual), ligature (cord-like) or gravity (hanging)
- Estimation of force – generally not possible or probably useful
Neck Anatomy

- **Carotid Artery**
- **Jugular Vein**
- **Hyoid Bone**
- **Thyroid Cartilage** (with fracture shown)
- **Tracheal Rings**
Obstruction of Vessels

Temporary obstruction of the carotid arteries, or the jugular veins (strangulation), or the airway (suffocation) will produce ASPHYXIATION - an interruption of oxygenation.
STRANGULATION

- Pressure placed upon the neck
- Resulting in reduction of blood flow through the brain
- If this persists, then oxygen delivery to the brain is impaired, and the brain cells become hypoxic, then anoxic, then dead
- This type of serious bodily injury is called ASPHYXIA, and it occurs first at the cellular level, then throughout the body
Suffocation

- Obstructing oxygen from getting into the lungs
- Sealing off the mouth and nose by manual compression
- Duct tape over face
- Head inside plastic bag
- Pillow over mouth and nose
- Sitting on chest
Timing

ASPHYXIATION

• If asphyxiation persists for long enough, the victim becomes unconscious, and then dies
• The rate of development of asphyxiation depends primarily on the circulation of blood through the brain, and to a much lesser extent it depends on the victim’s ability to breath through the airway -- airway obstruction is rarely a factor in fatal strangulation assault, but death may be accelerated if suffocation occurs simultaneously with the strangulation assault.
Effect of Strangulation and Suffocation

STRANGULATION AND SUFCCOATION

• With complete and sustained obstruction of both jugular veins:
  – 20-30 seconds causes petechiae above the point of constriction
  – 2 minutes to full unconsciousness
  – another 2 minutes of sustained unconsciousness until death

• With complete obstruction of the mouth and nose by suffocation, you get the same approximate time interval, but the petechiae become generalized throughout the body, rather than just isolated to the head.

These are just approximate times. The presence of certain predisposing conditions can accelerate the process of irreversible asphyxiation -- the duration of sustained compression required to reach the “point of no return.”
Factors Involved Determine Risk of Death

How do we know if there has been serious bodily injury, or a significant risk of death?

- Duration of Applied Force
- Quantity of Applied Force
- Surface Area Of Applied Force

Lethality risk is linked to several simultaneous factors, including pre-existing natural disease, and intoxicants.
Signs-Symptoms-Injuries
## Recognition

### Signs and Symptoms

#### What to Look and Listen for

<table>
<thead>
<tr>
<th>Breathing Changes</th>
<th>Voice Changes</th>
<th>Swallowing Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty Breathing</td>
<td>Raspy voice</td>
<td>Trouble swallowing</td>
</tr>
<tr>
<td>Hyperventilation</td>
<td>Hoarse voice</td>
<td>Painful to swallow</td>
</tr>
<tr>
<td>Unable to breath</td>
<td>Coughing</td>
<td>Neck Pain</td>
</tr>
<tr>
<td>Labored or loud breathing (hissing sound)</td>
<td>Unable to speak</td>
<td>Nausea/vomiting/drooling</td>
</tr>
</tbody>
</table>

#### Additional Important signs and Symptoms

<table>
<thead>
<tr>
<th>Loss of bowel and bladder</th>
<th>Skin abrasions</th>
<th>Red linear ligature marks/bruising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconsciousness</td>
<td>Lip incised abrasions</td>
<td>Light-headed or head rush</td>
</tr>
<tr>
<td>Petechiae</td>
<td>Bite marks inside of mouth/tongue</td>
<td>subconjunctival hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Patches of hair loss</td>
<td>swelling of tongue</td>
</tr>
</tbody>
</table>
SIGNS (WHAT YOU MAY SEE OR HEAR):

- Blood Red Eyes
- Neck Swelling
- Bruising
- Red Spots
- Scratches
- Rope Burns
INJURY DURING STRANGULATION OR SUFFOCATION ASSAULT

• Possible to touch the neck or cover the mouth and nose without causing strangulation or suffocation injury or posing a risk of serious injury or death

• Touching the neck becomes strangulation if there is sufficient pressure to cause internal injuries that promote asphyxiation
Multiple Strangulation attacks= increase in neuropyschological symptoms (> 5 events - D Smith et al)

- Nightmares
- Personality changes
- Depression
- Insomnia
- Suicidal ideation
- Anxiety
- Memory Loss
- Dizziness
- Tinnitus
- PTSD/other symptoms >>> anoxic encephalopathy, psychosis, seizures, amnesia
- CVA and progressive dementia
- Abused women in general have more headaches, back pain, STI, vaginal bleeding, vaginal infections, pelvic pain, painful intercourse, UTI, appetite loss, abdominal pain and digestive problems than never abused women
Mental Health and Behavioral Changes

- Due to brain cells deprived of oxygen
- If interruption brief, symptoms and signs are temporary and generally resolve.
- If longer, findings may be permanent and not resolve.
- Memory loss-brain cells that affect memory die first/
  Cells that stimulate breathing/control bowel and bladder >>>> cells last to die>>>>near death
Complications
Potentially Fatal Medical Complications of Strangulation Assault

Aspiration of gastric contents with pneumonitis

Fracture of trachea or larynx with air leak

Swelling of the glottis or larynx with airway obstruction (complicated by intoxication)

Carotid artery dissection or thrombosis with stroke

In one case, persistent pain on swallowing apparently caused the victim to become dehydrated in a hot residence, and death was by dehydration.
## Long Term Effects of Strangulation


<table>
<thead>
<tr>
<th>Symptom</th>
<th>Yes (n)</th>
<th>Valid percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td>23/41</td>
<td>63</td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td>7/41</td>
<td>17</td>
</tr>
<tr>
<td><strong>ENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vision change</td>
<td>11/40</td>
<td>28</td>
</tr>
<tr>
<td>Ringing in ears (tinnitus)</td>
<td>14/49</td>
<td>36</td>
</tr>
<tr>
<td>Sore throat</td>
<td>24/41</td>
<td>59</td>
</tr>
<tr>
<td>Voice change</td>
<td>18/40</td>
<td>45</td>
</tr>
<tr>
<td>Difficulty swallowing (dysphagia)</td>
<td>17/39</td>
<td>44</td>
</tr>
<tr>
<td>Neck pain</td>
<td>28/41</td>
<td>68</td>
</tr>
<tr>
<td>Neck swelling</td>
<td>14/40</td>
<td>35</td>
</tr>
<tr>
<td>Nose bleed</td>
<td>4/41</td>
<td>10</td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult breathing</td>
<td>34/40</td>
<td>85</td>
</tr>
<tr>
<td><strong>Gastrointestinal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heartburn/acid reflux</td>
<td>10/34</td>
<td>30</td>
</tr>
<tr>
<td><strong>Genitourinary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscarriage</td>
<td>4/38</td>
<td>11</td>
</tr>
<tr>
<td>Involuntary urination (incontinence)</td>
<td>4/38</td>
<td>11</td>
</tr>
<tr>
<td><strong>Skin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scratches on neck</td>
<td>18/41</td>
<td>44</td>
</tr>
<tr>
<td>Tiny red spots (petechiae)</td>
<td>22/41</td>
<td>54</td>
</tr>
<tr>
<td>Red linear marks</td>
<td>26/41</td>
<td>63</td>
</tr>
<tr>
<td>Rope or cord burns</td>
<td>3/40</td>
<td>8</td>
</tr>
<tr>
<td><strong>Neurological</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye lid droop (ptosis)</td>
<td>8/40</td>
<td>20</td>
</tr>
<tr>
<td>Facial droop</td>
<td>4/39</td>
<td>10</td>
</tr>
<tr>
<td>L or R sided weakness</td>
<td>7/30</td>
<td>18</td>
</tr>
<tr>
<td>Paralysis</td>
<td>2/40</td>
<td>5</td>
</tr>
<tr>
<td>Loss of sensation</td>
<td>12/39</td>
<td>31</td>
</tr>
<tr>
<td><strong>Psychiatric</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory problems</td>
<td>12/39</td>
<td>31</td>
</tr>
<tr>
<td>Depression</td>
<td>30/37</td>
<td>81</td>
</tr>
<tr>
<td>Suicidal ideation</td>
<td>12/39</td>
<td>31</td>
</tr>
<tr>
<td>Insomnia</td>
<td>26/39</td>
<td>67</td>
</tr>
<tr>
<td>Nightmares</td>
<td>27/39</td>
<td>70</td>
</tr>
</tbody>
</table>
Lethality
Lethality of Strangulation

• CAN LEAD TO DEATH IN MINUTES, SOMETIMES SECONDS
• 50% of our DV homicides involve an incident of strangulation within the year prior
• Life long effects even with no visible injury
• Symptoms can disappear rapidly
• Prior non-fatal strangulation was associated with greater than 6x odds of becoming an attempted homicide
• Victims of prior attempted strangulation are 7x more likely of becoming a homicide victim.
• (Glass, et al, 2008).
Strangulation is a Red Flag...

- When battered women were asked what made them believe they were in danger or not -- the majority of women perceiving a great amount of danger in both a shelter & a hospital study mentioned “choking” as a tactic used against them that made them believe their partner might kill them.
  - Stuart & Campbell, 1989
Violence: Recognition, Management and Prevention

NON-FATAL STRANGULATION IS AN IMPORTANT RISK FACTOR FOR HOMICIDE OF WOMEN

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Reprint Address: Nancy Glass, PhD, MPH, RN. School of Nursing, Johns Hopkins University, 525 N. Wolfe Street, Room 439, Baltimore,
MD 21205

Abstract—The purpose of this study was to examine non-fatal strangulation by an intimate partner as a risk factor for major assault, or attempted or completed homicide of women. A case control design was used to describe non-fatal strangulation among complete homicides and attempted homicides (n = 506) and abused controls (n = 427). Interviews of proxy respondents and survivors of attempted

INTRODUCTION

The 1993 National Mortality Followback Survey of Adults (NCFSA) included 12,000 adult and elderly deaths.

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