STRANGULATION INJURY: PERSPECTIVES FROM A CANADIAN EMERGENCY DEPARTMENT

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I respectfully acknowledge that I am on the traditional lands of Australia’s First Peoples
Disclosures:

- I have no real or perceived conflicts of interest
  - Vancouver City Jail
  - Medical Legal Society of BC
  - BC Women’s Hospital
  - Vancouver Coastal Health

- I have no affiliation with industry

- “A career? A life? Isn’t that a conflict of interest?”
Objectives

• Brief stats on strangulation injury presenting to ER

• Why a designated protocol for investigating strangulation injury was necessary

• Negotiating “Buy-in” from consultants and knowledge translation to associated agencies
Definintion – why language matters

• **STRANGULATION** – Asphyxia by closure of the blood vessels and/or air passages of the neck as a result of external pressure on the neck

• (CHOKING – object in upper airway that impedes oxygenation; SUFFOCATION – obstruction of the airway at nose /mouth)

• **Ligature strangulation** – constricting band tightened by force other than body weight

• **Manual strangulation** – external pressure by hands, forearms or other limbs

• **Hanging** – constricting band tightened by gravitational weight
Why is strangulation injury important?

- Potentially lethal immediate and/or delayed sequelae

- Victims of prior attempted strangulation are **7 times** more likely to become homicide victims
  - Strack G. On the edge of homicide: Strangulation as a Prelude. Criminal Justice. 2011; 26(3)

- Strangulation injury often under recognized
For the purposes of this discussion

- Non-fatal strangulation injury
- Inflicted
- Patients > 13 years of age
Vancouver General Hospital

- Approx. 100,000 ED visits/year
- Level 1 Trauma centre
- Provincial referral centre
- Adults only

(Sexual Assault Service)
Sexual Assault Service at VGH

- Approx. 350 pts / yr
- MD and Nurse Examiners (SANE)
- Offer SA Medical care and Forensic evaluation

*Consultant role with bad injuries → care handed back to Emergency doctor
What about Strangulation Injury?

• As an Emergency Triage chief complaint, “strangulation” is exceedingly rare

• However….  
  • Up to 30% of sexual assault victims, and up to 80% of domestic violence survivors presenting to our SA Service disclose being strangled
There was a Disconnect…

- SAS team was identifying a subset of ER patients that had potentially life threatening / life altering injuries.

- The Emergency doctors were not seeing these patients often enough to fully appreciate the potential consequences of the mechanism of injury, AND,

- there were not standardized protocols for workup for strangulation.
PSYCHOLOGICAL INJURY

PTSD, depression, suicidal ideation, memory problems, nightmares, anxiety, severe stress reaction, amnesia, and psychosis.

DELAYED FATALITY

Death can occur days or weeks after the attack due to carotid artery dissection and respiratory complications such as pneumonia, ARDS and the risk of blood clots traveling to the brain (embolization).

Today, 38 States have legislation AGAINST STRANGULATION.

VAWA 2013 added strangulation and suffocation to FEDERAL LAW.
**RECOMMENDATIONS for the MEDICAL/RADIOGRAPHIC EVALUATION of ACUTE ADULT, NON-FATAL STRANGULATION**

Prepared by Bill Smock, MD and Sally Sturgevin, DMR, RANSE A
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Endorsed by the National Medical Advisory Committee. Bill Smock, MD, Chair; Cathy Baldwin, MD, Dean Hawley, MD;
Ralph Pinheiro, MD; Heather Reuss, MD; Steve Raczynski, MD; Ellen Tkalchew, MD; Michael Vescera, MD

**GOALS:**
1. Evaluate carotid and vertebral arteries for injuries
2. Evaluate bony/cartilaginous and soft tissue neck structures
3. Evaluate brain for anoxic injury

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**Strangulation patient presents to the Emergency Department**

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**History of and/or physical exam with ANY of the following:**

- Loss of Consciousness (anoxic brain injury)
- Visual changes: “spsps,” “flashing light,” “tunnel vision”
- Facial, intraoral or conjunctival petechial hemorrhage
- Ligature mark or neck contusions
- Soft tissue neck injury/swelling of the neck/cartoid tenderness
- Incontinence (bladder and/or bowel from anoxic injury)
- Neurological signs or symptoms (LOC, seizures, mental status changes, amnesia, visual changes, cortical blindness, movement disorders, stroke-like symptoms)
- Dysphonia/Aphonia (hematoma, laryngeal fracture, soft tissue swelling, recurrent laryngeal nerve injury)
- Dyspnea (hematoma, laryngeal fractures, soft tissue swelling, phrenic nerve injury)
- Subcutaneous emphysema (trachea/laryngeal rupture)

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**Recommended Radiographic Studies to Rule Out Life-Threatening Injuries** *(including delayed presentations of up to 6 months)*

- **CT Angio of carotid/vertebral arteries** *(GOLD STANDARD for evaluation of vessels and bony/cartilaginous structures, less sensitive for soft tissue trauma)* or
- **CT neck with contrast** *(less sensitive than CT Angio for vessels, good for bony/cartilaginous structures)* or
- **MRA of neck** *(less sensitive than CT Angio for vessels, best for soft tissue trauma)* or
- **MRI of neck** *(less sensitive than CT Angio for vessels and bony/cartilaginous structures, best study for soft tissue trauma)* or
- **MRI/MRA of brain** *(most sensitive for anoxic brain injury, stroke symptoms and intracerebral petechial hemorrhage)*
  - Carotid Doppler Ultrasound *(NOT RECOMMENDED, least sensitive study, unable to adequately evaluate vertebral arteries or proximal internal carotid)*

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**History of and/or physical exam with:**

- No LOC (anoxic brain injury)
- No visual changes: “spsps,” “flashing light,” “tunnel vision”
- No petechial hemorrhage
- No soft tissue trauma to the neck
- No dyspnea, dysphonia or odynophagia
- No neurological signs or symptoms (i.e., LOC, seizures, mental status changes, amnesia, visual changes, cortical blindness, movement disorder, stroke-like symptoms)
- And reliable home monitoring

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**Discharge home with detailed instructions to return to ED if:**
- neurological signs/symptoms, dyspnea, dysphonia or odynophagia develops or worsens

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**Continued ED/Hospital Observation** *(based on severity of symptoms and reliable home monitoring)*

- Consult Neurology/Neurosurgery/Trauma Surgery for admission
- Consider ENT consult for laryngeal trauma with dysphonia
REFERENCES
(Recommendations based upon case reports, case studies, and cited medical literature)

13. Sethi PK, Sethi NK, Torgovnick J, Arsura E, Delayed Left Anterior and Middle Cerebral Artery Hemorrhagic Infarctions After Attempted Strangulation, A case report; Am J Forensic Med Pathol 2012;33:105-108
BAD STUFF!
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*References on page 2
Care after Strangulation

We are providing you with these instructions because you have reported being choked or strangled. Being strangled is a very scary experience. It can also affect your immediate health. You seem to be doing well, and likely will recover completely, but please go to your nearest Emergency Department or call 911 immediately if you notice:

- Difficulty breathing or shortness of breath
- Loss of consciousness or “passing out”
- Changes in your voice or difficulty speaking
- Difficulty swallowing, lump in throat, or muscle spasms in throat or neck
- Tongue swelling
- Swelling to throat or neck
- Prolonged nose bleed (greater than ten minutes)
- Persistent cough or coughing up blood
- Persistent vomiting or vomiting up blood
- If pregnant, vaginal bleeding
- Left or right-sided weakness, numbness, or tingling
- Headache not relieved by pain medication (Tylenol or Motrin as directed on bottle)
- Seizures
- Behavioral changes or memory loss

It is important that a physician check out these symptoms.
How did we get buy-in?

- Emergency physician led discussion with Radiology dept.
  - Presented already established, peer-reviewed protocol
  - Stressed collaboration, but gave “ownership” to Radiology
What was helpful?

• Emergency physician initiated
• Forward-thinking colleagues; collaborative effort
• VGH is an Academic Trauma Centre
• Affiliated with UBC Medical School
• Socialized medicine
• Ongoing education
• Patient handout
Knowledge dissemination:

• Within Radiology – Dept. rounds
• Within Emergency Dept. – Dept. rounds locally and provincially (webcast)
• Sexual Assault Services – locally / provincially
• First Responders – Ambulance and Police
• Community service agencies – EVA BC; others
Take home points

• Non-fatal strangulation injury can be life-threatening
• ASK about strangulation – especially with your SA and DV patients
• Identify that strangulation injury in the context of IPV is a marker for a detailed risk assessment – e.g. Radiology/ Social work
• Work with your colleagues
• Become a lead / resource
Resources & ???

- Training Institute on Strangulation Prevention (google it)
- Local champions
- RCPA (?)

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