

Guideline

Subject: **Clinical Forensic Assessment and Management of Non-Fatal Strangulation**

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Purpose

To provide guidelines for forensic medical practitioners who see assault victims who give a history of non-fatal strangulation.

Definition

Strangulation is external compression to the neck that can cause consequences that may be fatal as a result of compression of, and injury to, the vital structures in the neck such as the airways, blood vessels and nerves of the neck.

Serious injury or death from Strangulation may occur in the following ways:

- Cerebral injury caused by arterial obstruction with resultant anoxia
- Cerebral hypoxaemia provoked by congestion of the brain vessels due to obstruction of venous return, resulting from compressive pressure applied to the jugular veins
- Asphyxia due to pressure on the larynx and/or trachea
- Cardiac dysrhythmia by pressure on the carotid node nerve causing cardiac arrest. This is the most uncommon cause of death and requires pressure to be applied over a very specific area of the body and sustained.
- Damage to the spinal column can result in permanent irreversible damage to the nerves supplying the body below the site of compression.

Serious injury may occur without visible signs of external injury. Symptoms of strangulation may include:

- Soft tissue:
 - Neck pain
 - Difficulty swallowing
 - Coughing
 - Hoarse voice (sometimes described as a 'hot potato voice')
- Neurological:
 - Bladder and or bowel incontinence
 - Feeling light headed/ dizziness/ headache
 - Loss of consciousness including a gap in memory
 - Auditory changes
 - Visual changes
 - Seizures
- Respiratory:
 - Difficulty breathing
 - Shortness of breath

Signs of strangulation include:

- Sub-conjunctival haemorrhage (this finding is not specific to strangulation)
- Petechial bruising above site of application of force; that is, on the face, around eyes/eyelids, on the oral mucosa and palate
- Swelling of face/ tongue
- Red marks on the neck
- Bruises and or abrasions to the neck
- Abrasions caused by fingernails of perpetrator or victim attempting to remove force/pressure
- Ligature marks may be evident; may be patterned relevant to ligature
- Petechial haemorrhages may be seen in the conjunctival mucous membranes and the skin proximal to the occlusion when venous pressure rises

Further notes:

- It is important to examine behind ears and back of neck/hairline for injuries that may be hidden.
- Serious consequences as a result of attempted strangulation may not be immediately apparent; swelling within the neck can be delayed after the infliction of force.
- Patient/victim may have discarded wet or soiled underwear after the event; may be forensically useful to retrieve.
- Not all patients/victims reporting non-fatal manual strangulation will have observable injuries.
- Injury photography should include posterior and lateral neck views; anterior neck images should include with chin raised.

Procedures for Assessment of Strangulation

History

A protocol for strangulation assessment documentation is found in Annexure A. A full history should be taken from the patient including details of the relative positions of victim and perpetrator, use of one or both hands, or arm or ligature or other object. The history should include review of possible symptoms and signs of strangulation.

Significant Alert

If the patient is referred directly to the forensic clinician the following historical red flags must be assessed:

- strangled with a ligature (may be more likely to produce a vascular injury)
- loss of consciousness
- loss of control of bowel or bladder
- difficulty swallowing
- voice change
- difficulty breathing
- the presence of neck pain

Assessment

- Vital signs
 - Pulse, blood pressure, oximetry, respiratory rate, level of consciousness

- Ear, nose and throat assessment:
 - stridor
 - dyspnoea
 - hoarse voice
 - swollen tongue
 - tender laryngeal / cricopharyngeal cartilage
 - subcutaneous emphysema
 - loss of laryngeal crepitus (the normal clicking sensation felt when the laryngeal cartilages are moved laterally. If there is no clicking it implies swelling between the laryngeal cartilage and vocal cords).
 - findings on oral examination
 - Carotid examination (auscultation of bruit; absence of bruit may indicate obstruction)

- Face
 - petechiae of face, eye, eyelids, palate, oral mucosa

- Neurological
 - Restlessness, confusion or irritation (indicating possible hypoxic brain injury)
 - Ataxia, limb weakness/ paraesthesia or other peripheral neurological signs including visual and/or auditory changes

Consider Ambulance Service transfer to the nearest hospital Emergency Department immediately. Specifically refer to the nearest emergency department immediately if any of the following are present:

History

- inability to swallow
- history of loss of consciousness
- history of incontinence

Examination

- stridor
- subcutaneous emphysema
- any voice change
- suspicion of hypoxic brain injury
- dyspnoeic
- dysphagia
- significant external bruising and / or tenderness of the neck
- loss of normal laryngeal crepitus

The patient should be handed over to the Emergency Department, to advise on referral to ENT for nasopharyngeal endoscopy / laryngoscopy, CT scanning of the brain, soft tissues and vascular structures (CT angiogram) of the neck as appropriate, and admission for observation.

At least six hours of observation is advised with late onset oedema reported to cause obstruction up to 36 hours after the incident.

Patients should not be discharged without instruction and accompanied by a responsible adult during the above time frame.

Evaluation

The patient should receive medical follow up if they report any change in condition or symptoms. This will be documented in clinical forensic medical notes. Appropriate medical referral should be made if review is required by another medical specialist. The documentation of clinical findings will be recorded in clinical forensic medical notes.

See annexure A for discharge instructions.

Key reference articles:

1. Strack GB. McClane GE. Hawley D. Violence: recognition, management and prevention. A review of 300 attempted strangulation cases part 1; criminal legal issues. Journal of emergency medicine vol 21; no3: pp 303-309. 2001.
2. McClane GE. Strack GB. Hawley d. A review of 300 attempted strangulation cases part ii: clinical evaluation of the surviving victim. Journal of emergency medicine. 21(3):311-5, 2001.
3. Hawley DA. McClane GE. Strack GB. A review of 300 attempted strangulation cases part iii: injuries in fatal cases. Journal of emergency medicine. 21(3):317-22, 2000.
4. Zilkens et al Non-fatal strangulation in sexual assault: a study of clinical and assault characteristics highlighting the role of intimate partner violence. J Forens Leg Med 2016 Oct: 43; pp1-7

Primary resources

1. Training Institute on Strangulation Prevention. See training institute website: www.strangulationtraininginstitute.com
2. Drop Box link: <https://goo.gl/rd9wdp>

Annexure A

Patients should be advised in writing upon discharge that if any of the below symptoms occur to return to the emergency department:

Neurological

- Increasing / severe headache, not relieved by pain medication
- Difficulty speaking or understanding speech
- Difficulty walking
- Numbness, paralysis, or weakness, usually on one side of the body
- Seizure
- Sudden confusion
- Sudden decrease in the level of consciousness
- Left or right-sided weakness, numbness, or tingling

Respiratory

- Difficulty breathing
- Difficulty breathing or shortness of breath
- Changes in voice or difficulty speaking
- Persistent cough or coughing up blood

Visual

- Drooping eyelid
- Sudden vision problems

Soft tissue

- Increasing neck pain
- Tongue swelling
- Swelling to throat or neck

General

- Dizziness or light-headedness
- Sudden loss of balance or coordination
- Vomiting
- Vaginal bleeding (if pregnant)
- Thoughts of suicide
- Thoughts of harming self or others
- Loss of consciousness or "passing out"
- Difficulty swallowing, lump in throat, or muscle spasms in throat or neck
- Prolonged nose bleeding (greater than ten minutes)
- Persistent vomiting or vomiting up blood
- Behavioural changes or memory loss

If the patient is seen immediately following strangulation some of the injuries may not yet be apparent. It must be advised that if any of the following develop or get worse in the next three days then further medical follow up is required.

- pinpoint red or purple dots on face or neck
- bruises on face, neck or body
- burst blood vessels in eyes
- swelling of face or neck