

Near-Hanging Injuries

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Case: A 15 yo boy is found in his bedroom hanging from a rope attached to a light fixture. His breathing is labored and he is responsive only to pain. He is periodically extremely agitated and combative.

AIRWAY

- C-spine protection is essential before, during and following endotracheal intubation
 - C-spine injury is less likely in incomplete hanging (see below) and suicide attempts.
- Indications for Intubation:
 - Signs of airway obstruction such as stridor.
 - Significant concern for impending airway compromise (eg, multiple fractures and subcutaneous emphysema).
 - Signs of pulmonary insult, such as respiratory distress, diffuse crackles, hypoxemia.



- Significant alteration of mental status.
 - GCS < 9, but also for agitation and combative behavior, which can be extremely dangerous.
- Standard RSI techniques should be employed, with a preference for hemodynamically neutral agents.
- Repeated unsuccessful attempts at endotracheal intubation should prompt surgical techniques.
 - Cricothyroidotomy should not be delayed when the patient is not receiving adequate ventilation and oxygen.
 - If children < 8 yo and when cricothyroidotomy is not possible due to anatomical distortion, percutaneous jet ventilation can be attempted.

BREATHING

- Look for signs of pulmonary edema/ARDS.
- Management is according to ARDSNet protocol (eg, low tidal volumes and permissive hypercapnia).

CIRCULATION

- Continuous cardiac monitoring is critical because patients may suffer unpredictable and sudden onset dysrhythmias, as well as sympathetic surges that may require immediate intervention.
- Near-hanging injuries are unlikely to result in hypotension without a concomitant traumatic injury or toxic ingestion/exposure.
- Use isotonic or hypertonic IV fluids to treat hypotension or shock
- Be judicious with fluids due to the risk of precipitating or exacerbating pulmonary and cerebral edema.

DISABILITY

- Elevate the head of the bed to 30 degrees.
- Avoid mannitol due to its possible association with pulmonary edema?

EXPOSURE

- Completely expose the patient, looking for other signs of trauma.
- Suicide notes, pill bottles, and other items may help direct further work-up and treatment.

Clinical Presentation

- Normal
- Odynophagia
- Dysphagia



- Dysphonia
- Stridor
- Dyspnea
- History
 - O When?
 - Timing is important. If it has been several hours, the risk of edema is less but the neurological prognosis is worse.
 - Complete and incomplete hanging? Strangulation?
 - Strangulation is defined as asphyxia due to external pressure on the airway and vascular structures of the neck.
 - Hanging is the suspension of the body, with compression due to the body's own weight.
 - Complete hanging refers to cases where the patient's feet do not touch the ground (eg, judicial hangings).
 - Complete hangings are associated with a greater incidence of c-spine and other fractures.
 - Suicide?
 - Notes at the scene or on/around the patient?
 - Suicide attempts are most commonly incomplete near-hangings.
 - Fractures are less likely
 - Consider co-morbid toxic ingestions/exposures.
- Physical Examination
 - Airway, lung and neurological examinations are key.
 - Ligature marks
 - Tardieu spots
 - Petechiae on mucous membranes
 - Subconjunctival hemorrhage

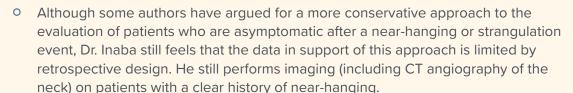
PITFALLS ◆

- The absence of physical examination findings does not rule out the need for further evaluation; a concerning history alone should prompt a diagnostic workup.
- Diagnostic Testing
 - Imaging



- CXR (for signs of edema and aspiration)
- CT head (if any alteration of mental status)
- CT angiogram of the neck
- Carotid artery ultrasound (an alternative for assessing the carotid arteries when CT angiogram is not performed).

PERSPECTIVES -



- Toxicology screen (especially acetaminophen and ASA)
- Treatment

PEARLS •

- Protocols that emphasize early attention to excellent supportive care have shown improvement of patient oriented outcomes.
- Steroids may be used for laryngeal edema.
- Antibiotics are not used routinely but may be used for patients with subcutaneous emphysema or aspiration.
- Anti-epileptic drugs may be used for patients with anoxic brain injury (eg, phenytoin)
- Prognosis

PEARLS •

- In patients that do not suffer cardiac arrest, the prognosis is better than one might expect based on initial presentation.
- Several series demonstrate that a significant proportion of patients who present with profound neurological and cardiopulmonary insults can improve to discharge with a good neurological outcome.
- The prognosis is poor in patients who suffer cardiac arrest.
- Disposition
 - Symptomatic patients are generally admitted to an intensive care setting.
 - Patients who are asymptomatic with normal imaging may be discharged. It is not otherwise known how long they should be observed.



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