ORIGINAL RESEARCH PAPER

Volume-8 | Issue-8 | August - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CARE OF PATIENT WITH LARYNGEOTRACHEAL INJURY (BULL GORE INJURY)- A CASE REPORT

Nursing

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ABSTRACT

Laryngotracheal injuries are not very common, but these injuries are fatal and life threatening.

It is usually found in patients with multiple traumas. Most often laryngotracheal injuries are unrecognized because of the subtle nature of the presenting complaints, which does not usually correspond with the severity of the illness. The management of these injuries is diverse and composite, as these patients present with different and unforeseeable symptoms. The emergent nursing management includes maintenance of a stable airway. Once the airway is secured, the patients are required to be prepared for surgical repair and management to ameliorate the long term functional disabilities in terms of breathing, speech and swallowing.

KEYWORDS

INTRODUCTION

The incidence of laryngotracheal trauma is 1 in 30,000 admissions to emergency departments (Thevasagayam MS & Pracy P., 2005). Neck wounds that extend deep to the platysma are considered penetrating injuries. Penetrating neck injuries comprises 5–10% of all trauma cases that present to the emergency department and result in significant mortality (Gupta B et al., 2011, Luntz M et al., 1993). Among penetrating neck injuries external injuries to the larynx threaten quality functioning of life (Trone T H et al., 1980) hence its management requires a logical approach with quick assessment of the adequacy of airway and circulation.

Specific patterns and mechanisms of laryngotracheal injuries

Although the spectrum of injury from blunt or penetrating trauma to the neck is broad, several identifiable patterns exist which correspond to specific mechanisms of injury.

Strangulation

Strangulation injuries, such as from assault or hanging, are associated with characteristic findings that result primarily from crush injuries to the anterior neck against the rigid cervical vertebral bodies.

Hyperextension injury

Hyperextension injuries result from shear and tensile forces acting on the aerodigestive structures fixed against the cervical vertebral bodies. Characteristic injuries include tracheal tears, vertical laryngeal fractures and, in rare cases, complete laryngotracheal separation. Laryngotracheal separation often occurs at the level of the cricoid cartilage, as the airway is comparatively immobile at this location.

Rapid acceleration and blunt impact (hit from behind)

The so called "padded dashboard" constellation of injuries, results from neck hyperextension during rapid acceleration followed by blunt impact of the anterior neck on the car dashboard or steering wheel. This is seen in unrestrained passengers or drivers hit from behind. The injury pattern is that of hyperextension shearing injuries accompanied by crush injuries to the anterior neck.

Pressure against a closed glottis

Rapid increase in intrathoracic or intratracheal pressure against a closed glottis during blunt chest or lower neck impact can result in laryngotracheal rupture. Any component of the subglottic airway can be affected, depending on the level of impact. The prototypical example would be tracheal rupture after rapid deceleration with inappropriately high seat belt position across the lower neck/chest. (Aaron and Anil, 2016)

Patients with Laryngotracheal trauma may present with the following signs:

- Dyspnea
- Stridor: The type of stridor may indicate the location of injury. Inspiratory stridor implies a supraglottic obstruction that may be caused by edema or a hematoma. Expiratory stridor generally results from a subglottic source, such as a tracheal injury. Biphasic stridor (inspiratory and expiratory) implies an injury at the level of the glottis.
- Hemoptysis.
- Ecchymosis of overlying cervical skin.
- Subcutaneous emphysema.
- Loss of normal thyroid prominence.
- Deviation of larynx.
- Loss of laryngeal crepitus—A "click" is generally palpated when the larynx is palpated and moved laterally. The loss of this "click" may occur due to laryngeal fixation or an injured larynx.(www.entnet.org)

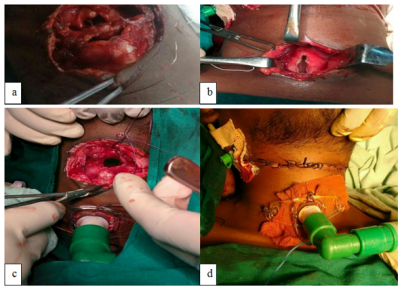

Figure 1: Larngotracheal trauma with thyroid cartilage defect
Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5376825/

Classification of laryngeotracheal injuries

The classification of larngotracheal injuries is based on the severity of injuries as given in the table 1.

Table 1: Classification of Laryngotracheal injuries

Groups	Severity of Injury in Ascending Order
Group 1	Minor endolaryngeal hematomas or lacerations without detectable fractures.
Group 2	More severe edema, hematoma, minor mucosal disruption without exposed cartilage, or nondisplaced fractures.
Group 3	Massive edema, large mucosal lacerations, exposed cartilage, displaced fractures, or vocal cord immobility.
Group 4	Same as group 3, but more severe, with disruption of anterior larynx, unstable fractures, two or more fractures lines, or severe mucosal injuries.
Group 5	Complete laryngotracheal separation.

Source: Schaefer Classification System.

Management of Laryngotracheal injuries

The management of laryngeal trauma varies according to level of injury. The aim of perioperative management of laryngeal trauma is to prevent progression of the injury and promote healing. The following are the important measures, the nurse must be able to perform

promptly:

1. Airway observation : Careful assessment of the airway needs to be done
2. Adjunct measures:
- Head of bed elevation
- Voice rest
- Cool humidified oxygen
- Systemic corticosteroids
- Anti-reflux medications
3. Speech therapy : This will definitely help patients regain speech

Case Report

A 50 year old Mr."A" presented to the casualty following bull gore injury to the neck. The incident allegedly occurred during a social occasion, a traditional sport (Taming of the bull - Jallikattu). On preliminary examination he was found to have an air leak via the neck laceration and was unable to phonate. Patient was conscious. On examination of the neck, lacerated contaminated wound of size 6 cm seen horizontally at the lower border of the thyroid cartilage. Soft tissues and laryngeal cartilages exposed. Air leak was present. On palpation, subcutaneous emphysema noted in the anterior aspect of the neck. Laryngeal defect palpated through the wound at the crico-tracheal level. No active bleeding was present.

Patient was taken for emergency tracheostomy, Direct Laryngoscopy, Oesophagoscopy and neck exploration with laryngotracheal reconstruction and stent placement. Postoperatively patient was on Naso Gastric Tube (NGT), corrugated rubber drain. He was started on IV antibiotics, Proton Pump Inhibitors and Analgesics. Daily wound dressing and tracheostomy tube care were done. On the 2nd post operative day, corrugated neck drain was removed; he was started on NGT feeding. On the 7th post operative day, he was switched to oral antibiotics and started on oral fluid intake along with NGT feeding. On the 8th post operative day, neck wound sutures were removed. On the 12th post operative day, Examination Under Anesthesia (EUA) larynx was done and the nasal stent was removed. Earlier on EUA larynx, airway was reduced to 4mm; fractured cricoid was seen protruding into the airway posteriorly at the subglottis.

Nursing care

Nursing management of Mr A with Laryngeotracheal injury (Bull gore injury) is presented using nursing process approach based on the problems/needs identified

1. **Nursing Assessment**:

On preliminary examination , he was found to have an air leak via the neck laceration. On palpation, subcutaneous emphysema noted in the anterior aspect of the neck.

Nursing Diagnosis:

Impaired breathing pattern related to Laryngotracheal injury leading to airway obstruction

Expected outcome:

Patient will have optimal breathing pattern as evidenced by normal respiratory rate, normal breath sounds

Interventions:

- Assessed the respiratory rate, oxygen saturation. Respiratory rate was 24 breaths/ minute and oxygen saturation was 95%
- Positioned in high fowler's
- Assisted with making of an emergency tracheostomy under local anesthesia
- Administered humidified oxygen via tracheostomy to prevent crust formation in the presence of mucosal damage and to limit transient ciliary paralysis

2. **Nursing Assessment**:

He was on portex tracheostomy tube size 7.5, needs q1h tracheal suctioning.

Nursing Diagnosis:

Ineffective airway clearance related to presence of tracheostomy tube, Laryngotracheal injury leading to airway obstruction (tracheal compression associated with edema)

Expected outcome:

Patient will maintain patent airway as evidenced by normal breath sounds, normal respiratory rate and depth of respirations

Interventions:

- Assessed the airway patency. He was tracheostomy tube size 7.5
- Performed additional measures to decrease risk of tube dislodgement: fastening tracheostomy ties, minimizing movement of outer cannula
- Monitored the oxygen saturation levels using pulse oximeter
- Provided tracheal suctioning every q1h and whenever needed to remove secretions
- Cleaned the inner tube every q4h and whenever needed
- Administered Salbutamol nebulization every q4h as per the order
- Nursed him in fowler's position to prevent tracheal compression and stress on the surgical site(Head end elevation may also help resolve laryngeal edema)

3. **Nursing Assessment**: He could not verbalize pain, had facial grimaces. Pain score was 6 out of 10.

Nursing Diagnosis: Acute pain related to Laryngotracheal injury

Expected outcome: Pain will be minimized as evidenced by verbalization of absence/ reduction in pain and reduction in pain score

Interventions:

- Assessed the patient's characteristics of pain. He had insidious severe neck pain. Non-opioid Analgesics were administered round the clock to control pain which was evidenced by him verbalizing that pain has reduced.
- Additional stressors or sources of discomfort were removed. Lights were put off when not needed. Visitors control was implemented to reduce further stress. Peaceful and quiet environment was offered to facilitate rest.
- Positioned him in comfortable position with comfort devices such as pillows and neck rolls in order to reduce pain and increase comfort.
- Taught diversional therapy techniques such as music, talking to a family member, reading books etc.

4. **Nursing Assessment**:

He was not able to phonate. On EUA larynx, bilateral vocal cords were not abducting well and were in paramedian position

Nursing Diagnosis:

Impaired verbal communication related to laryngotracheal injury

Expected Outcome:

The patient will successfully communicate needs and desires

Interventions:

- Maintained a patient, calm approach; listened attentively and allowed ample time for communication
- Asked short questions that required short answers, eye blinks or nod of head
- Provided pad and pencil, picture board and also tried to ensure placement of intravenous line does not interfere with client's use of these communication aids
- Informed significant others and health care personnel of techniques being used to facilitate patient's ability to communicate. Stressed the importance of consistent use of these techniques.
- Provided a call bell which was accessible all the time
- Advice voice rest because it minimizes worsening of laryngeal edema

5. **Nursing Assessment**: Unexpected situation in life, new environment, new therapeutic regimen

Nursing Diagnosis: Deficient knowledge related to new experience, new interventions, and hospitalization secondary to lack of exposure

Expected outcome: Patients and caregivers demonstrates knowledge and appropriate skills

Interventions:

- Assessed their knowledge regarding home care (specially on tracheostomy care), follow up and medications
- Discussed with them the need of tracheostomy and its purpose

- Demonstrated on tracheostomy care and return demonstration was done by the wife and daughter
- Explained to them about the need for follow up and continuity of medications
- Also discussed on the various complications, it's signs and symptoms and their management, emphasizing when to seek medical help

Evaluation of care: Patient was discharged on the 10th post-operative day. He was started on oral feeding, his pain reduced, he maintained a patent airway with tracheostomy in situ, he slowly started phonating.

CONCLUSION

Laryngeal trauma or injuries are not a very common thing that is seen, yet it is a life threatening issue. Airway obstruction is a potential complication with these patients. Hence immediate management of the maintenance of a patent airway is very vital. Nurses play an important role in enhancing the quality of living of patients under their care. Nurses at all levels of care from emergency department admission till discharge have specific roles which need to be clearly executed for the good prognosis of the patient which include care of the tracheostomy tube, wound care, complications and rehabilitation. Hence, nurses and other health professionals need to be aware of the subtlety of the signs and symptoms of these injuries and act immediately.

REFERENCES:

1. Gupta B, Gulati A, Gupta D. A rare presentation of pellet injury in the neck. ISRN Surg. 2011;2011:306126.
2. Luntz M, Nusem S, Kronenberg J. Management of penetrating wounds of the neck. Eur Arch Otorhinolaryngol. 1993;250(7):369–74.
3. Miracle, A. C., & Uzelac, A. (2016). Imaging blunt and penetrating trauma to the neck: Clinical relevance and management. Appl Radiol, 45(7), 14-19.
4. Moonsamy, P., Sachdeva, U. M., & Morse, C. R. (2018). Management of laryngotracheal trauma. Annals of cardiothoracic surgery, 7(2), 210.
5. Thevasagayam MS, Pracy P. Laryngeal trauma: a systematic approach to management. Trauma. 2005;7:87.
6. Trone TH, Schaefer SD, Carder HM. Blunt and penetration laryngeal trauma: a 3 year review. Otolaryngol Head Neck Surg. 1980;88:257–61.
7. Ulrich, S. P., &Canale, S. W. (2005). Nursing care planning guides. Elsevier Saunders,.
8. www.entnet.org