ORIGINAL RESEARCH PAPER

Otorhinolaryngology

THE PATTERN OF CUT THROAT INJURIES, EARLY MANAGEMENT AND OUTCOME-A PROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL

KEY WORDS: Cut Throat Injury, Tracheostomy, pharyngo-cutaneous fistula, videolaryngoscopy

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ABSTRACT

Objective: To analyze pattern, sex and age ratio, common causes, the most common site and extent of the injury in the patients with cut throat injury at our hospital. To compare the same with previous similar studies conducted at other centers in different parts of the world. Also to note the early management and outcome in our study. **Setting:** Department of ENT and Head and Neck Surgery, Gauhati Medical college and Hospital, Guwahati, from January 2022 to January 2023. **Methods:** A total of 60 cases of cut throat injury were included in our study. Proforma was prepared to collect data. **Results:** 60 cases of cut throat injury patients were included in the study. Out of 60 cases 51 were males and 9 were females. Simple primary wound closure was done in 58 cases and 2 required secondary wound repair. In 20 patients, tracheostomy with primary repair was done. 32 patients needed psychiatric consultation. **Conclusion:** In our study, majority were males between 20 years to 40 years from lower middle socioeconomic status. Early and improved management will reduce the mortality and morbidity.

INTRODUCTION

Cut throat injuries are one of the emergency conditions widely managed by ENT specialists.[1] These are incised injuries or those resembling incised injuries in neck inflicted by sharp objects such as razor, knives or broken bottle pieces and glass.[2-4] These injuries can occur from an accident, homicide, and suicide.[5] The homicidal being the most common. Its motives include political conflict, land related disputes, dacoity (robbery), sex-related crimes, familial disharmony etc[6] Accidental causes include fall on sharp objects, road traffic accidents, workplace machine injuries, sports injury etc.[5,10,11] Suicidal causes include mental illness, familial disharmony substance abuse, poverty, unemployment and love affair related matters especially in the context of our country.[8]

The throat is the anterior part of the neck, in front of the vertebral column. It consists of larynx, trachea, pharynx, vital blood vessels – carotid and jugular, esophagus, cricoid, thyroid and hyoid bone. The presentation of injuries could range from being asymptomatic to hoarseness, laryngeal stridor, or dyspnea secondary to airway compression or aspiration of blood. Injury to the great vessels may follow the cut throat injury and the patient typically present with visible external blood loss, neck hematoma formation, and in varying degrees of shock.[7] According to Roon and Christensen's classification, injuries of the neck are divided into three anatomic zones.[9] Zone I injuries occur at the thoracic outlet, which extends from the level of the cricoid cartilage to the clavicles. Zone II is superior to zone I injuries occur in the area between the cricoid and the angle of the mandible. Injuries here are the easiest to expose and evaluate. Zone III injuries are between the angle of the mandible and the base of the skull.[9] Although zones I and III are protected by bones and the vital structures in zone II are not protected by bone, so the risk of injury is different in three zones. Zone II has comparatively easy access for clinical examination and surgical exploration. Zone I and III have a higher risk for occult vascular injury. Thus the management of neck trauma is challenging and overwhelming. It is important to acknowledge the fact that neck contains a lot of important structures including vessels, nerves, lymphatics, aerodigestive tract. So injury to the neck should be dealt with atmost caution. In this study we will focus on pattern, cause and outcome of cut neck injuries.[9]

MATERIAL AND METHODS

This is a prospective study of all cases of anterior neck injuries presenting as cut throat emergencies that were admitted and managed over one year period from January 2022 to January 2023 in the Department of ENT in Gauhati Medical college and Hospital, Guwahati. The study was pre-approved by the Institutional Ethics Committee. A total of 60 cases of cut neck injury who came to ENT emergency and admitted were evaluated and registered for the study. Patients of all age groups and sexes were included in the study with exception of patients with serious systemic illness. The consent was obtained from the patient or the next kin in case of a minor.

From the moment that injury is sustained, every aspect of decision making and management is essential in terms of survival of victim. The initial assessment of trauma patient, besides clinical examination should include analysis of interaction between the patient, the mechanism of injury and the extend of injury sustained. The 'timeline concept' is an essential component, both assessment and response should take place in the time window prior to irreversible damage or death. The ATLS(Advanced Trauma Life Support) that is airway, breathing, circulation and disability. This hierarchy of priorities is instituted at the time of attending.

A: Airway with cervical spine control -all patients should be given cervical spine immobilization, wound should be thoroughly examined and an immediate assessment of airway is done, a compromised airway due to cut and exposed larynx/pharynx were shifted to emergency operation room. Emergency tracheostomy with repair of wound was done after obtaining consent for the same.

B: breathing and ventilation -assessement of oxygen saturation is done and high flow oxygen is given when required.

C: circulation and hemorrhage -For patients presenting with shock, two IV lines with 14-gauge cannulae inserted and Normal saline and colloids were infused. In patients with haemorrhagic shock, blood transfusion was done after crossmatching. Inj Tranexamic acid is given in all cases.

D- neurological deficit is assessed and managed.

After the stabilization of the patient, a complete history was taken and thorough physical examination and wound examination was done for exposed hypopharynx, larynx,

trachea, other inuries like hesitation cuts are looked for. Primary repairment of the wound in layers was done under LA in emergency room in most of the cases. In the patients who presented with airway compromise due to cut and exposed larynx/pharynx were shifted to emergency operation room. Emergency tracheostomy with repair of wound was done under GA after obtaining consent for the same. Initially Cuffed Tracheostomy tube was inserted which was changed to Uncuffed after 48hours. Ryle's tube was inserted in patients with pharyngeal mucosal injury. Nasogastric tube is deferred in suspected or proven case of skull base injury as this may result in inadvertent cranial injury.Tube insertion is done after ruling out cervical spine injury and defining laryngeal anatomy properly if possible with fibreoptic laryngoscopey. Direct visualization of larynx while introducing NG tube helps in all settings. Hemodynamically stable patients were shifted to ENT ward after repair of wound and patients with deteriorating vitals were shifted to ICU for proper care.

Routine blood investigations like CBC, Viral markers, S.Creatinine, RBS, LFT etc. were carried out. In patients with history of substance abuse(alcohol), LFT with GGT were checked. Patients were started on IV antibiotics (ceftriaxone). Regular dressing of wound and regular suction of tracheostomy tube were carried out. of X-ray soft tissue neck was done to check any surgical emphysema. CECT neck was done in patients to check injury to any other vital structures and complications. Video laryngoscopy was done regularly to check healing of mucosal injury, vocal cord mobility, laryngo-tracheal narrowing. In the patients presenting with suicidal injuries, physical assault and history of substance abuse, Psychiatry opinion were sought. Anti-psychotics, anti-depressive drugs were started for the patients depending on diagnosis like Schizophrenia, substance abuse psychosis, depression etc.

Stitch removal was done on 10^{th} day. Decannulation of tracheostomy tube was done after the patient was stable at around 10^{th} -14^{th} day which was followed by closure of the stoma. Video laryngoscopy was done before discharge. Ryle's tube was removed after patient was able to take oral feed at around 7^{th}-10^{th} day.

One patient developed wound dehiscence with pharyngo-cutaneous fistula. Patient was given injection glycopyrrolate for 7days along with IV antibiotics, parenteral and nasogastric tube feed, nil orally and regular dressing. Secondary wound repair was done under GA after 2weeks. Other patient who presented lately but otherwise hemodynamically stable, regular dressing and wound debridement was done followed by secondary repair.

Data was categorised according to name, age, sex, address, mechanism of injury, cause of injury, site of injury, extent of the injury, socio-demographic pattern, hospital arrival delay, duration of hospital stay, treatment given and the final outcome of the patient.

RESULTS

In our study 60 patients were included, out of which 51(85%) were males and 9(15%) were females. Male to female ratio was 6:1. Age ranged from 5 years to 79 years (mean age 26.4). The majority of the patients were young adults between 20-40 years. Only 1 patient was below 10yrs (1.6%) due to accidental injury due to fall from tree. Out of 60 cases, 42(70%) were from rural areas and 18(30%) were from urban areas. The most common cause of cut throat was accidental 28(46.6%) followed by suicidal 20(33.3%) and homicidal 12(20%).

According to anatomical classification, 12(20%) cases had zone I injury, 40(66.7%) patients had zone II injury whereas 8(13%) cases had zone III injury. In all cases, skin, soft tissue and small vessels were severed. The laryngopharyngeal injury was present in 25 cases. Tracheal injury was present in 7 cases. Internal jugular vein injury was present in 2 cases. Thyroid gland and vessels were injured in 9 cases. No case had carotid artery injury.

Simple primary wound closure was done in 58 cases and 2 required secondary wound repair for late presentation and pharyngocutaneous fistula. In 20 patients, tracheostomy with primary repair was done. Out of 60 patients,10 patients required ICU care post wound closure and 2 patients expired. Decannulation and repair of tracheostomy was done for 17 patients before discharge. Out of 20 patients, 3 patients who were discharged with tracheostomy tube in situ, 1 patient came for cannulation after 1week and the other 2 cases were lost to follow up. Out of 60 patients, 3 patients had recurrent laryngeal nerve injury and required speech therapy. Psychiatrist consultation was required for 32 cases which included both suicidal and homicidal cases.

Table 1: Distribution according to cause of injury

Distribution According To Cause Of Injury		
Variables	Frequency	%
Homicidal	12	20
Accidental	28	46.6
Suicidal	20	33.3
Total	60	100

Table 2: distribution based on zone of injury

Distribution Based On Zone Of Injury			
Zone Of Injury	Zone I	Zone Ii	Zone Iii
	12	40	8
	20%	66.6%	13%

Table 3: distribution based on type of wound

Distribution on the basis of type of wound		
variable	frequency	Percentage
Incised wound	21	35%
lacerated	25	41.6%
Stab	4	6.7%
abrasion	8	13%
Sutured wound	2	8.3%

Table 4:Distribution based on depth of structural involvement.

Distribution according to depth of structural involvement		
variables	frequency	Percentage
Cricoid cartilage	2	3.3
Thyroid cartilage	20	33.3
Hyoid bone	2	3.3
Thyrohyoid membrane	9	15
Cricothyroid membrane	9	15
Trachea	1	1.6
Thyroid and vessels	9	15
Internal jugular vein injury	2	3.3
pharynx	9	15
Vocal cord paralysis	3	5

Fig 1: suicidal cut neck injury with hesitation cuts.
Fig 2: primary repair of the injury.

Table 5:Distribution according to treatment provided

Distribution According to treatment provided		
Primary repair only	58	96.6%
Secondary repair	2	3.3%
Tracheostomy with primary repair	20	33.33%
Blood transfusion	18	30%
Psychiatry consultation	32	53.3%
ICU care	5	8.3%

Fig 3 :homicidal cut neck injury showing injury of laryngopharynx (thyroid cartilage)

DISCUSSION

Cut neck injury is an acute life threatening condition and may lead to many comorbidities depending on structures involved.

In our study total 60 patients were included with male to female ratio being 6:1. Majority of patients were between 20-40 years of age and youngest being 6years of age due to accidental fall from tree. Our result is similar to many studies.[7,8,12,13,17-19]

The cause of cut neck injury in our study was mainly Accidental followed by suicidal and homicidal.The number of homicidal cut neck injuries accounts to the fact that interpersonal conflict is increasing in the current generation. There is also an increase in number of psychiatric illness leading to an increasing number of suicidal cut neck injuries. The causes in our study were Depressive illness, followed by Substance abuse psychosis and Schizophrenia.

During primary survey all patients are assessed applying the principles of Advanced trauma life Support(ATLS) to rapidly identify and treat life threatening injuries.It is done concurrently and sequentially. Management protocol to be followed:

- Proper assessment of wound.
- priority is given for airway management-tracheostomy or intubation.
- control of external haemorrhage,
- observe for circulatory collapse if present should be corrected by fluid resuscitation and blood transfusion.
- After stabilization of patient repair of wound is done.

The concept of damage control surgery(DCS) has been expanded to include faciomaxillary and neck injury, idea being severely traumatised patients with impaired physiology have poor outcomes. patient is adequately resuscitated and physiologically optimised from lengthy and complex reconstructive procedures. Consequently, surgical intervention in trauma patients with physiological abnormality is limited to life saving procedures like control of haemorrhage, removal of contamination,revascularisation of ischemic organs.definitive reconstructive procedures are performed once

All patient with injury to the anterior part of neck should be carefully evaluated for the presence of laryngeal trauma.Symptoms and signs to be looked for include

- pain elevated by phonation and deglutition
- cough and expectoration
- dyspnoea of varying degree due to edema of soft tissue,blood in trachea
- hemoptysis
- stridor/hoarseness of voice
- dysphagia suggestive of endolaryngeal trauma/ esophageal/hypopharyngeal injury
- tenderness and swelling of neck may be associated with loss of laryngeal landmarks
- emphysema of neck suggestive of perforation of viscous e.g,larynx,hypopharynx
- crepitation of neck
- ecchymosis of skin
- in severe injuries compromised airway due to compression/asphyxiation may occur.

Patient with thyroid cartilage injury would present with symptoms like neck pain, voice change, pain while swallowing, shortness of breath and signs including ecchymosis, tenderness of neck, subcutaneous emphysema, loss of prominence of thyroid cartilage, tracheal deviation/stridor.

Once the patient is stabilized /if the patients condition permits indirect laryngoscopy/direct laryngoscopy should be perfoermed this reveals important information regarding degreeof edema, hematoma ,mucosal lacerations, posterior displacement of epiglottis, exposed fragments of cartilage. Fibreoptic laryngoscopy gives improved visualization. Xray soft tissue neck is useful to assess subcutaneous emphysema, displacement of epiglottis, fracture or displacements of hyoid bone, change in configuration of air column.

CT scan of neck is important to assess laryngeal injuries.

After assessing patient,those who can be taken up for conservative management is advised voice rest,observed for respiratory distress,humidification of inspired air is done,steroid therapy to resolve edema and hematoma and prevent scarring and stenosis to a particular extend. Antibiotics are given to prevent perichondritis and cartilage necrosis.

Emergency tracheostomy may be required in cases of patients with laryngeal injury with respiratory difficult where intubation may be difficult.hemostasis is achieved primary repair is done,wound is re-explored once patient is stabilized.Surgical management is done taking care of exposed cartilage,large mucosal laceration,laceration with involvement of free edge of vocal cord,vocal cord immobility, displaced cartilage fracture,dislocated aretynoid cartilages and airway obstruction. In our study there was only one case of thyroid cartilage injury which was superficial and primary repair was done.cut edges of the prelaryngeal/ pretracheal muscles are identified and sutured to strengthen the gap between the cartilages.

In our study out of 60 patients 20 patients required tracheostomy. Ladapo[3] did tracheostomy in all his patients. Okoye[15] in his study,carried out tracheostomy in all 3 cases and advised routine use of tracheostomy in all patients. Ezeanolue et al[16] also carried out tracheostomy in all patient.. Bhattachargee et al[11] did tracheostomy in 15 out of 26 cases.In our study, 3 of tracheostomised patients survived on giving proper post-op care. Only 2 patients expired even after proper ICU care due to sepsis and hypovolemic shock.

Only 1 patient developed pharyngo-cutaneous fistula. It can be prevented while carrying out pharyngo-hypopharyngeal repair by meticulous approximation of tissues, use of Ryle's tube and nil oral feeding for a minimum of 7 -9days.[14] Should

there be a pharyngo- cutaneous fistula, Nasogastric tube feeding must continue for as long as possible until the fistula closes. If the fistula persists for more than 6weeks, malnutrition, faulty surgical technique, presence of foreign body or underlying malignancy especially in elderly must be excluded. Flap closure using local, regional or distant flaps after excision of fistula may be needed in extreme cases.[14]

In cases of upper airway damage pressure necrosis of nasal ala may occur owing to the placement of an oversized nasogastric tube or prolonged placement.There is a chance of false tract formation,mucosal injury,ulceration in post cricoid region.

Only 1 patient developed moderate subglottic stenosis, presented with respiratory distress 2 months post tracheostomy. patient was evaluated using bronchoscopy and cect scan of neck.

On an average hospital stay for the patients were approximately 4wks. Similarly in the study by Manilal et al patients (73.13%) were discharged within 14 days. During the stay psychiatric evaluation was done for patients with suicidal or homicidal cut neck injuries and antipsychotic and depressive drugs were prescribed. Psychological counselling and rehabilitation were done. Videolaryngoscopy was done for all patients. Speech therapy was given to patients with RLN involvement. Patients were followed up after discharge.

Despite improvement in emergency medical service, improper management of airway injuries have high mortality rate 26.8% - 30%.Failure to achieve airway patency can become fatal.

CONCLUSION

Cut neck injuries are serious injuries and are almost fatal because of presence of a lot of vital structures in neck, but with immediate medical care and performing emergency procedures like tracheostomy can reduce the morbidity and mortality to a great extent. Social commitment and political motivation, uplifting the socioeconomic condition, individual awareness, increase in economic growth, and literacy rate will prevent the cut throat injuries. Proper awareness about psychiatric disorders and mental health education needs to be provided. People should be motivated to seek psychiatric consultation when they are in need. Regular follow up and checkups should be provided.

Table 6:Comparison with different studies.

Studies	Gender	Age	Cause	Zone	injury	tracheostomy	Psychiatric illness
Our study	Male (51 out of 60)	young adults	Accidental (46.6%)	Zone II	Laryngeal injury (41.6%)	20	20
Alam et al[12]	Male (32 out of 35)	young adults (60%)	suicidal 77.14%	Zone II	-	-	8
Vishwanatha et al[13]	Male (34 out of 42)	32 years	Homicide (73.8%)	Zone II (80.9%)	Laryngeal injury (42.8%)	40(95%)	-
Parajuli et al[8]	Male (14 out of 20)	young adult	homicidal (60%)	zone II (60%)	Laryngeal (50%)	14(70%)	3(15%)
Kumar et al[7]	Male (27 out of 30)	young adults	accidental 11(37%)	zone II (86.6%)	Larynx/pharynx (50%)	15 out of 30(50%)	10 out of 30
Jain et al[17]	Male 10 out of 30	Young adults	Suicidal 13(43.3%)	-	-	Not done	13
Gilyoma et al[18]	Male 69 out of 98	Young adults	Homicidal 54(55.1%)	Zone II(65.3%)	Laryngeal (57.1%)	70.4%	16
Panchappa et al[19]	Male 43 out of 51	Young adults	Homicidal(50.98%)	-	-	16(33.33%)	-

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