

Original Research Article

A study of incidence, causes and management of cut throat injuries

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ABSTRACT

Background: Cut throat injuries is trauma that needs prolonged hospitalization, high cost of health care and reduced quality of life and above all death. The aim of the study was to study on cut throat of injuries including its incidence factors provoked and management.

Methods: it is prospective study conducted for a period of 2 years. A total of 30 cases of cut throat injuries were included in the study of patients from age group 5-70 yrs.

Results: Male to female ratio was (9:1). Cut throat injury was more common in males who came from rural area. Most of them were unemployed and of low socioeconomic group and of low education level. Cut throat injuries were common in Hindu religion followed by Muslims. The most common cause of cut throat injury in our study was homicidal 17 (56.6%) followed by suicidal 9 (30%) and accidental 4 (13.3%). In our study 11 (36.6%) cut throats were superficial and 19 (63.33%) were deep. 19 (63.33) cases sustained grievous injury with 7 patients were dead. In all the cases (100%) skin, soft tissue and small vessels were severed. The laryngotracheal injury was present in 12 cases. The majority of patients reached the hospital between 6-10 hours. Simple wound closure was done in 17 cases. 30 patients 23 patients had improved in follow up with no complaint of alteration in voice. 12 (40%) patients had stay of around 0-10 days and with only 10 (33.33%).

Conclusions: with the advent of newer diagnostic modalities management of cut throat injuries which allow more precise and better management of cut throat injuries. The management of cut throat injuries require a multidisciplinary approach requiring the close collaboration of the otolaryngologist, the anaesthetist and the psychiatrist.

Keywords: Cut throat injury, Otolaryngologist, Diagnostic modalities

INTRODUCTION

Cut throat injuries are potentially dangerous, if not treated in time may lead to death of the patient due to asphyxia and haemorrhage. Neck being unprotected anatomic region it is a common site of injuries that are potentially dangerous and require immediate management.¹ Cut throat injuries may be open or incised or incised looking in the neck. Penetrating trauma into neck involved by sharp object through skin and violating the platysma layer of the neck. These injuries can be with

stabbing, gunshot wounds and puncture injuries. It can be suicidal, homicidal and accidental. Throat injuries comprises major methods adopted to kill, presence of vital blood vessels, nerves and wind pipe, so any damage to this structure invites fatality as death is inevitable.

Over all cut throat injuries account for 5% to 10% approximately of all traumatic injuries with multiple structures being injured in 30% of patients.¹⁻³ However, in developing countries the incidence is increasing at a fast rate partly because of poor socioeconomic status,

poverty, limited resources, unemployment, easy access to firearms, alcohol and substance misuse and increased crime rates.^{5,6}

However in developing countries the incidence is increasing at a fast rate partly because of increasing conflict over limited resources, poor socioeconomic status, poverty, unemployment, easy access to firearms, alcohol and substance misuse and increased crime rates. These factors provoked us to conduct a study on incidence, causes and management of cut throat of injuries in government general hospital Guntur.

METHODS

The study is a prospective study conducted at government general hospital, Guntur, Andhra Pradesh, India, from December 2015 to December 2017. A total of 30 cases of cut throat injuries were included in the study.

Inclusion criteria

Patients from age group 5-70 yrs are taken into the study. The consent was obtained from the patient or from their parents or guardian in case of a minor.

Exclusion criteria

All unconscious patients, patients who refused to give consent, patients with associated head injury.

Data was categorized according to name, age, sex, locality, Mechanism of injury, cause of injury, site of injury, extent of injury, sociodemographic pattern, hospital arrival delay, duration of hospital stay, treatment given and the final outcome of the patient. The data is represented in the form of tables and charts. The results obtained were expressed as percentage of the total cases included in the study.

The evaluation of a patient with cut throat injury should start with advanced trauma life support (ATLS), which begins with a primary survey giving importance to the airway, breathing, circulation, disability and exposure. Primary survey is followed by secondary survey which includes head to foot examination of the patient. Further investigations are required in stable patients to plan the management of a cut throat injury

Evaluation of a patient with cut throat injury

Primary survey

The primary survey is an initial assessment of factors that cause early death in a patient with cut throat injury. It focuses on factors such as hypoxia, hypovolaemia secondary to haemorrhage, shock, airway obstruction, tension pneumothorax and associated head injury.

Airway and cervical spine protection

The patient is examined for the evidence of airway obstruction which may present as stridor and use of accessory muscles of respiration. Associated facial fractures such as mandibular fractures and large cervical haematomas may compromise the airway.

Endotracheal intubation is done to protect the airway in patients with GCS <8. An endotracheal tube may sometimes be inserted directly into the trachea through the site of a penetrating cut throat injury.

Breathing

Tension pneumothorax presents with hypoxia, restlessness, hyper-resonance to percussion, decreased air entry, contralateral tracheal shift and elevated jugular venous pressure. It is decompressed by needle thoracocentesis with a large wide bore needle placed through the second intercostal space in the midclavicular line followed by insertion of a drain. Haemothorax is identified by dullness on percussion and decreased air entry.

Circulation and perfusion

Two high-flow lines with 14 gauge cannulae are inserted in the antecubital fossae. The line should not be inserted on the side of massive bleeding. In case of a shock patient, start with 2L of crystalloid and proceed to emergency blood transfusion. Active bleeding from a cervical wound may be controlled with compressive dressing or digital pressure.

Disability: The GCS and the pupil size are recorded and the power in the limbs assessed.

Exposure: All clothes are removed in order to avoid missing associated injuries and the patient is kept warm.

Adjuncts to primary survey: ECG monitoring, pulse oximetry, blood pressure monitoring, arterial blood gas analysis, haemoglobin level, blood sugar levels and chest X-ray– to rule out haemothorax or pneumothorax, pneumomediastinum (tracheal or oesophageal injury) and widened mediastinum should be ruled out X-ray neck lateral view– to exclude cervical spinal column injury and prevertebral air (pharyngeal or oesophageal injury).

Management of a patient with cut throat injury

The diagnostic studies do not have 100% sensitivity to detect oesophageal and vascular injuries, low morbidity associated with negative exploration, additional time and effort associated with expectant observation increases the mortality rate associated with cut throat injuries. Hence most of the centers advocate emergency surgical

exploration in a patient with cut throat injury and repair

of the vascular and aerodigestive tract injuries.

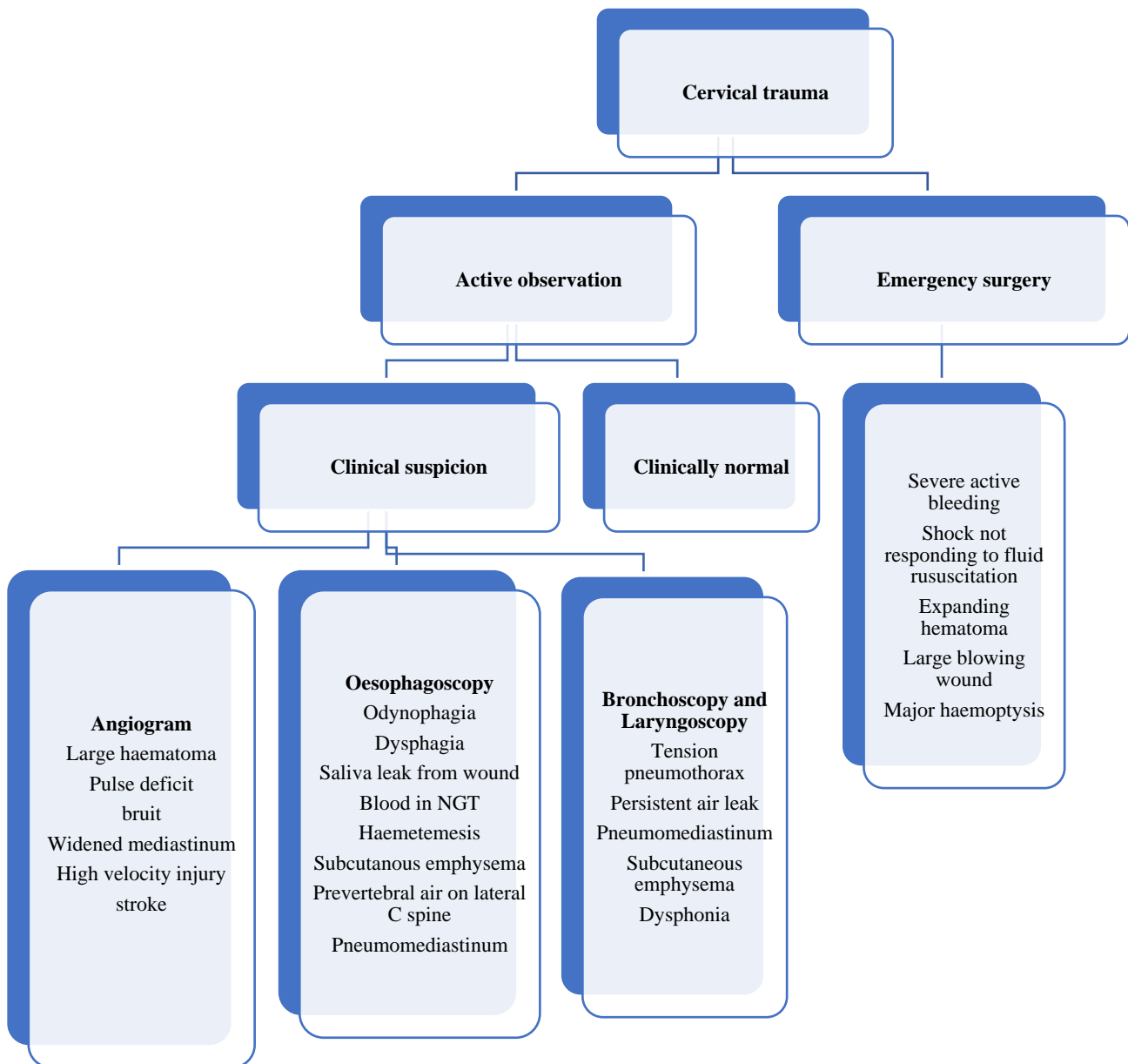


Figure 1: Selective surgical exploration algorithm.

Investigation for cut throat injury [CTI] are chest X-ray, cervical spine X-ray, direct pharyngoscopy, flexible nasopharyngopharyngoscopy, oesophagoscopy, barium swallow, direct laryngoscopy, tracheobronchoscopy, angiogram, colour flow doppler (CFD), computed tomography (CT)

Patients with superficial injuries involving only the skin and subcutaneous tissue are repaired in the minor operation theatre under local anaesthesia by infiltrating the margins with 2% lignocaine with adrenaline, the airway is anaesthetized with 10% lignocaine spray.

Superficial cut throats were managed with the simple layered closure of wound 2-0 or 3-0 vicryl suturing under aseptic conditions.

All patients were given tetanus toxoid and antibiotics. Dirty wounds were cleaned first with a lot of saline followed by diluted betadine and antibiotic solution. After thorough cleaning the injury is properly examined for any pharyngeal, oesophageal, laryngeal, tracheal injuries. Care must be taken to examine for any vascular injury. Any vascular or aerodigestive tract injuries should be repaired in an operation theatre under general

anaesthesia either through endotracheal intubation or through the tracheostomy site.

RESULTS

Table 1: Demographic distribution of cut throat injuries.

	Frequency	Percentages (%)
Age of the patient		
5-15 years	1	3.33
16-30 years	14	46.66
31-45 years	10	33.33
45-70 years	5	16.6
Sex		
Males	27	90
Females	3	10
Depth of injury		
Superficial	11	36.66
Deep	19	63.33
Religion		
Hindu	15	50
Muslim	11	36.6
Christian	4	13.3

A total of 30 patients with cut throat injury were included in the study, in which males were 27 (90%), females were 3 (10%). Male to female ratio was 9:1. Age ranged from 5-70 years (mean age 29.9 years). Most of the patients were Hindu 15 (50%) by religion followed by Muslims 11 (36.6%).

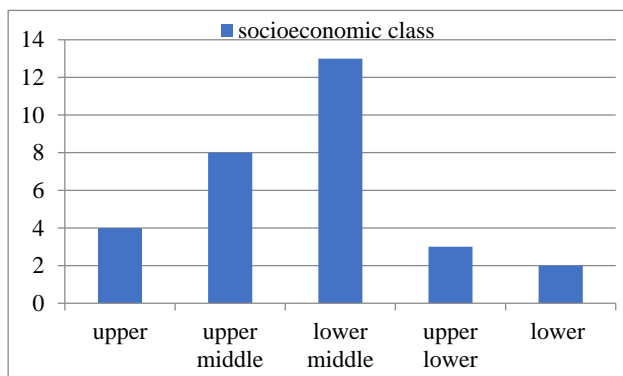


Figure 2: Socioeconomic class.

The majority of these patients were young adults ranged between 16-30 years of age (46.6%) followed by middle age 31-45 years of age (33.3%). Only 1 was below 15 years of age and only 5 were above 45 years. 20 (66.6%) were from rural areas and 10 (33.33) were from urban areas.

In our study 11 (36.6%) cut throats were superficial and 19 (63.33%) were deep. Out of 30 patients only 5 patients were tracheostomized. Out of 5 patients, 3 were taken off the tracheostomy tube and discharged without it. 20

patients were mentally sound and 10 patients were found to have some mental illness.

Table 2: Distribution of cut throat injury.

	Frequency	Percentage (%)
Severity of injury		
Simple	11	36.66
Grievous	19	63.33
Zone of injury		
Zone I	4	13.3
Zone II	26	86.6
Zone III	0	0
Mental status		
Mentally sound	21	70
Psychotic symptoms	9	30

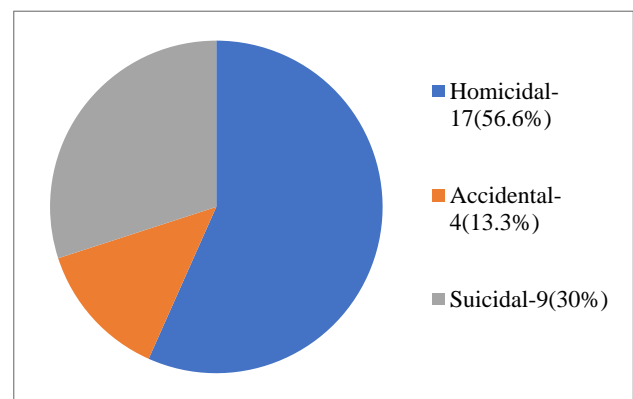


Figure 3: Cause of injury.

The most common cause of cut throat was homicidal 17 (56.6%) followed by suicidal 9 (30%) and accidental 4 (13.3%). Incised and laryngotracheal injury were most common.

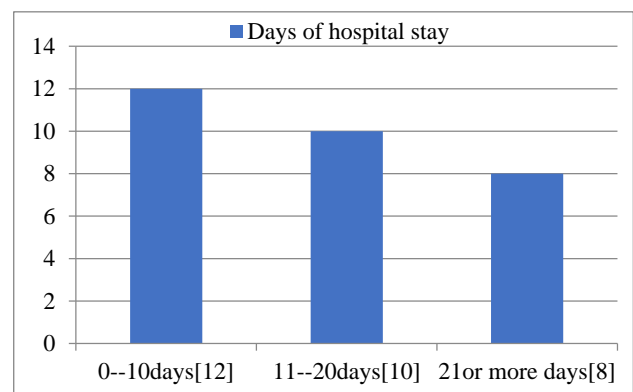


Figure 4: Hospital stay of patients in study.

The hospital stay on an average was less than 3 weeks. In our study 12 (40%) patients had stay of around 0-10 days and with only 10 (33.33%) patients staying for 10-21 days 8 (26.66%) stayed more than 21 days. Common causes of morbidity included a change in voice, wound

infections, change in voice, neck mobility limitation, dysphagia and tracheal stenosis.

Table 3: Distribution of cut throat injuries on the basis of type and site of wound.

Type of wound	Frequency	Percentage (%)
Incised	18	60
Lacerated	7	23.3
Stab injury	3	10
Sutured wound	2	6.6
Gunshot	0	0
Site of wound		
Skin and soft tissue	9	30.00
Laryngotracheal injury	12	40.00
Isolated pharyngeal injury	2	6.66
Laryngopharyngeal injury	1	3.33
Carotid injury	1	3.33
IJV injury	2	6.66
Thyroid injury	1	3.33



Figure 5: Cases in study; A= Case 1; B=Case 2.

Case 1

35 yr old male Muslim patient with a suicidal cut throat injury by a blade over the anterior aspect of the neck, superficial injury with sparing of major vessels and aerodigestive tract.

Case 2

5 yr old male Hindu patient with homicidal cut throat injury with a knife, associated with injury to the trachea with a blood clot over the wound.

DISCUSSION

Cut throat injuries are scarcely reported in medical literature. Cut throat injuries and associated deaths are quite common but data on guidelines of management are lacking in the medical literature. Cut throat injuries constitute 5% to 10% of all the trauma cases.³ Amongst these 30% of the patients have multiple injuries in other parts of the body. According to the World Health

Organization, every year over 5 million people around the world die as a result of injury.^{2,6}

In our study of cut throat injuries in a tertiary care hospital, 30 consecutive cases of cut throat injuries were included. Male to female ratio was (9:1). Cut throat injury was more common in males who came from rural area. Most of them were unemployed and of low socioeconomic group and of low education level. The age group ranged from 5-70 years. Most of them were young between the ages of 20-40 years and belong to low socioeconomic group according to Kuppaswamy socioeconomic scale. Our results were similar to other previous studies. Adeyi et al studied 67 cut throat cases, 47 were males and 20 were females, between 7-73 years of age (mean 28.82 years).⁵ The majority of victims were young adults 41 (61.19%) between 21 and 30 years of age, 52 (77.61%) were from rural community and 53 (79.10%) belonged to low socioeconomic class.

In our study, on the basis of religion, cut throat injuries were common in Hindu religion followed by Muslims. This is because Hindus are more common in our region followed by Muslims. Results of our study correlated with previous study. In a study by Nason et al, 130 patients ranged in age from 4-74 years (mean 29 years) with males predominating (109 males, 21 females).⁷ Hindu patients outnumbered the patients from other religions.

The most common cause of cut throat injury in our study was homicidal 17 (56.6%) followed by suicidal 9 (30%) and accidental 4 (13.3%). The motive behind a homicidal injury include property disputes, fights and sexual offences. The most common cause of suicidal injuries are psychosocial stressors (familial disharmony) or psychiatric illness like depression, schizophrenia, bipolar disorder etc. psychiatric illness is the strongest predictor of suicide.³ Suicide occurs 20.4 times more frequently in individuals with psychiatric illness than the general population.⁶ The accidental causes include RTA, fall on sharp objects, kite string injuries, accidental strangulation, agriculture and household machine injuries.

Our results correlated well with previous studies. Adoga et al published a case series of three patients with Cut throat injuries, all three of these patients had attempted suicide.⁶ Mohanty et al studied 588 suicide victims, financial burden (37%) and marital disharmony (55%) were the principle reasons for suicide attempts.⁸

Mody and Pandey observed that in India, suicidal wounds of the throat are rare. In contrast, cut throat injuries were reported to be caused by suicide attempts in majority of cases in western countries.⁹⁻¹¹ But in developing countries, homicide is the most common cause of cut throat injury. Since, India is a developing country; homicide is the most common cause of cut throat injury

as observed in our study. Males dominated in both homicidal and suicidal cut throat injury.

Unemployment can act as a stressful life event leading to suicide with studies suggesting an increase in the suicide rates among unemployed individuals than in the general population. Socioeconomic improvement of otherwise normal individuals by provision of jobs for example and family planning education can eliminate the triggering factor of unemployment. Herzog et al mention in their study, in their study dividing the injuries of the around neck in to three anatomic zone for the purpose of case of assessment.¹²

In our study that 26 (86.6%) patients had cut throat in anatomical Zone II, 4 (13.3%) patients had an injury in Zone I, while none of the patients have injuries in Zone III. This is in accordance with other studies. In a study by Simpson et al, the most common zone in penetrating neck trauma was Zone II (64%) of cases.¹³ Accordingly, in a study Peralta et al, the location of injury was Zone I (lower neck) in 20 cases (15%), Zone II (midportion of neck) in 108 (81%) cases and Zone III (upper neck) in 5 (4%) cases.¹⁴

In our study most of the patients reached the hospital within 6-12 hours following injury. Very few were managed outside. A number of victims presented with an open wound and active bleeding. Isehk et al suggested that pharyngeal, hypopharyngeal and laryngeal mucosal lacerations should ideally be repaired early (within 24 hours), concluded that cut throat injuries require a multidisciplinary approach and can be managed with a better prognosis if patients present early to the hospital and receive prompt attention.⁴

In our study most of the patients presented with incised wounds 18 (60%) followed by lacerated wounds 7 (23.3%) and stab wounds 3 (10%), only 2 patients presented with sutured wounds with superficial cut throat injuries involving only the skin and soft tissues in 9 cases and deep injuries involving there skin, soft tissue larynx/pharynx, trachea in 19 cases.

Our results were similar to a study conducted at Srinagar government hospital which reported 5 patients with superficial neck injuries and 19 patients with deep injuries and 1 patient with injury to major vessel (left common carotid and internal jugular vein). In a study conducted by Manilal et al, regarding the involvement of deep structures of neck, larynx 50 (74%), hypopharynx 37 (31%) and trachea 17 (91%) were the common organs involved.⁵ Most of the superficial cut throat injuries were managed at a peripheral health care centers, only deep cut throat injuries with injury to the aerodigestive tract and major vessels were referred to tertiary care hospital. Since our hospital is a tertiary care hospital, our study reported majority of deep cut throat injuries compared to superficial injuries.

In our study most of the patients presented with open wounds with bleeding, four patients presented with haemorrhagic shock. Two patients presented with sutured Cut throat wounds. Our results were similar to a study conducted at Guwahati which reported 55 (33.33%) cases with open wounds with bleeding and haemorrhagic shock in 4 (2.42%) cases.

In our study, laryngotracheal injury was reported in 12 cases, isolated pharyngeal injury in 2 cases, laryngopharyngeal in one case, in these patients airway is successfully managed either with intubation through an obvious airway defect or endotracheal/orotracheal intubation or tracheostomy. In our study, tracheostomy was done in 5 patients and orotracheal intubation is attempted in 14 patients with successful orotracheal intubation in 11 patients.

Peralta et al describes some of the problems encountered during general anesthesia in treating cut throat injuries are, intubation difficulties, intravenous induction agents producing hypotension which is undesirable for a bleeding patient and danger of vomiting and aspiration.¹⁴ Inhalation induction is also difficult, due to partial breathing through the neck uncertain control of airway. Sometimes it is difficult to predict the turn of events in some patients as initially they do not resent with signs of vascular injury and have patent airway, later on in these patients, as the sepsis sets in, may go into carotid blow out and may lead to death of the patient. In our study in spite of airway injuries, orotracheal intubations could be undertaken by manipulation of the neck. In a study done by Venkatachalam et al concluded that when the trachea itself is injured, it is preferable to conserve normal trachea by placing the tracheostomy tube through the damaged area.¹⁵ This will facilitate subsequent surgical repair of the trachea. In our study out of 5 tracheostomy patients, 3 were done through the damaged area.

Nonsurgical management of tracheal injuries have been reported in literature. These patients usually suffer from permanent airway or voice impairment and may have increased difficulties protecting the airway from aspiration of pharyngeal contents. Therefore the preferred technique in a patient with cut throat injury is awake intubation through the mouth by conventional method under topical analgesia.¹⁶

In our study investigations like cervical radiograph, CT scan, MRI, angiography was done in stable cases with suspected laryngeal, tracheal, oesophageal or vascular injury. Previous studies supported that radiography alone is not sufficient for diagnosing cervical airway trauma and the additional use of CT scan of the trachea and larynx and MRI can be very useful in discovering subtle previously undetected injuries. Gonzalez et al in a prospective blinded study, showed that dynamic CT scan in penetrating neck injury was sensitive in diagnosing associated injuries.¹⁷ They however concluded that the

majority of these injuries do not require identification or surgical intervention.

Either way, definitive airway management and emergency exploration should not be delayed by radiological investigations, since an apparently stable airway can rapidly progress into acute airway obstruction. As in our study we did not subject any patient to radiography or imaging prior to securing an airway and haemodynamically stabilizing the patient.

In our study after securing the airway, all deep cut throat injuries 19(63.33%) cases involving the larynx/ pharynx or trachea are considered for emergency exploration of the neck with repair of the injured tissues. Patients with vascular injury are considered for repair of vessels involved. Blood transfusion is given in 13 cases of cut throat injury. Four patients who presented with haemorrhagic shock are given plasma expanders like haemacel.

Patients with superficial cut throat injuries 9 cases (36.66%) involving the skin and soft tissues injury were managed in the minor OT with local infiltration with lignocaine and suturing of the wounds was done. Wound debridement was done in most of the cases presented more than 6 to 8 hrs from the time of injury. Exploration of the wound was done to identify vascular or neural damage and treated accordingly.

Demetriades et al reported in a prospective study of 335 penetrating neck injuries that combination of clinical and selective investigations yielded a specificity of 85% and sensitivity of 100% to identify clinically significant vascular and aerodigestive tract injuries.¹⁷ They advocate emergency exploration for the absolute indications for neck exploration, which include shock not responding to resuscitation, minor active bleeding, haematoma, dyspnoea, subcutaneous emphysema, hoarseness, dysphagia or minor haemetemesis.

In our study, primary repair without tracheostomy was done in 25 cases, primary repair with tracheostomy was done in 5 cases and secondary repair was done in none of the cases. Our results were supported by other studies in which a study conducted at Srinagar government hospital in 26 patients, primary repair without tracheostomy done in 15 cases and primary repair with tracheostomy in 9 cases. In this study, simple repair, laryngeal/hypopharyngeal repair and tracheostomy were the most common surgical procedures performed, similar treatment options were reported by other authors.^{4,5}

In our study, after successful management of a cases of cut throat injuries by surgical exploration 20 patients attained full recovery without any defect, Full recovery with permanent defect is attained in 4 patients, death occurred in 4 patients, 3 of them with tracheostomy tube removal was done by 10-12 days. In our study, psychiatric consultation was obtained in all patients who

attempted suicide as suicide is a sign of underlying mental illness and there is a possibility of second attempt. A study reported 25% of patients as having made a second attempt after suicide. In a study done at Srinagar, 66% of attempted suicide cases had some form of psychiatric ailment, 33% had major depression. Two patients had schizophrenia which includes a patient with a history of 3 suicidal attempts. In our study also, most of suicide patients had psychiatric illness, hence referred to psychiatrist after management of cut throat injury. In our study one patient had attempted suicide the day after the repair of cut throat injury.

In our study in most of the patients with cut throat injury, the hospital stay was on an average less than 3 weeks. 12 (40%) patients had an average hospital stay of 10-12 days, 10 patients had an hospital stay of 12-20 days with only 8 patients had a hospital stay of more than 3 weeks. During the hospital stay, postoperative care of the patient was taken, broadspectrum antibiotics, Ryle's tube feeding for patients with laryngopharyngeal injury, regular suctioning and cleaning of the tracheobronchial secretions in tracheostomy, regular wound dressings. Suture removal was done 7-10 days after repair.

The length of hospital stay has been reported to be an important measure of morbidity among trauma patients. Prolonged hospitalization is associated with an unacceptable burden on resources for health and undermines the productive capacity of the population through time lost during hospitalization and disability.^{4,5} In our study hospitalization helped the patient to improve, help to diagnose any undetected vascular or aerodigestive tract injury, regular wound dressings, Ryle's tube feeding and helped in early recovery of the patient.

The role of imaging in blunt or penetrating laryngotracheal injuries is controversial; however in cases where uncertainty about the extent of injury, Failure to evaluate the endolarynx and trachea and history of significant trauma, to airway is present, Imaging can be considered and computed tomography remains a definitive modality. Patients were further observed during their management at hospital and morbidity was noted. Similarly in a study by Manilal et al, among 67 patients most of the patients (73.13%) were discharged within 14 days.⁵

In our study all cut throat injury patients were subjected to videolaryngoscopy and endoscopy after repair to detect any associated injury to the vocal cord or any undetected aerodigestive tract injury. Patient is discharged after suture removal, two patients were discharged with a tracheostomy tube and patients are advised follow up every biweekly.

CONCLUSION

According to the results of our study, it is supposed that early appropriate measures could save lives in vast

majority. Addressing the root causes of violence such as poverty, illiteracy, unemployment and substance abuse will reduce the incidence of cut throat injuries in our society. Providing the efficient emergency health care services for primary care and effective ambulance system for immediate transport of cut throat victims to hospital will decrease time delay in reaching the hospital.

In conclusion, even though cut throat injuries are not common, managing them successfully is often a challenge. With the advent of newer diagnostic modalities, further research is done in the management of cut throat injuries which allow more precise and better management of cut throat injuries. The management of cut throat injuries require a multidisciplinary approach requiring the close collaboration of the otolaryngologist, the anaesthetist and the psychiatrist.

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