

LARYNGOTRACHEAL TRAUMA MANAGEMENT AND ASSOCIATED MORBIDITY AND MORTALITY: 4-YEAR EXPERIENCE AT A TERTIARY CARE CENTER

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ABSTRACT

Objective: Cut throat injuries pose a great therapeutic challenge due to the multiple vital structures that are vulnerable to injuries in a small, confined unprotected area. In this study, we describe the site and depth of the injury, etiology, management, and prognosis.

Methods: This was a retrospective study of 18 laryngotracheal trauma patients treated at the department of ENT in MDM hospital between April 2017 and January 2020.

Results: Out of 176 cases of penetrating neck injury, 18 patients presented with a breach in the laryngotracheal framework. Male: female ratio was 17:1. The peak age of incidence is in the 2nd and 4th decade of life. Accidental cut throat injury was the most common mode of injury (83%), followed by homicidal (11%) and then suicidal (5%). Endotracheal intubation (where possible) or emergency tracheostomy was done to secure the airway in all the cases, followed by surgical debridement and laryngeal/hypopharynx repair. Post-operative endoscopy is useful to identify complications. Wound dehiscence was the most common complication.

Conclusion: Cut throat injuries are one of the common ENT surgical emergency. Timely intervention is paramount, because it may otherwise cause death of the patient. Securing the airway, control of hemorrhage, and fluid and blood replacement is the mainstay to prevent complications such as shock, sepsis, laryngeal stenosis, or fistula formation.

Keywords: Cut throat, Emergency, Laryngotracheal trauma.

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INTRODUCTION

Neck injuries are classified either as blunt or penetrating trauma; blunt trauma cases involve tissue disruption, while tissue loss occurs in penetrating injuries. Since the location of the injury can be helpful in calculating the risk and the line of management, it is important to know that the neck can be divided into three major zones; zone 1-below cricoids to thoracic inlet, zone 2-from cricoids to the angle of mandible, and zone 3-above the angle of mandible. According to the Schaefer Fuhrman's classification, injury to the larynx may range from minor mucosal edema/hematoma to complete laryngotracheal separation. Penetrating neck trauma that involves the laryngeal framework is one of the most emergency conditions managed by the ENT surgeons. Cut throat injuries are an unparalleled form of suffering which is associated with not only physical trauma but mostly also with inconspicuous emotional and mental instability and hence financial burden on the community resources. The etiology of cut throat injuries can be suicidal, homicidal, and accidental [1,2].

Accidental causes are mostly related to the road traffic accidents, fall from height, wire fencing, and animal hit [3]. Homicidal cases are mostly due to political and religious conflicts, land disputes, or as a consequence of lover's quarrel. Suicidal attempts stem from familial problems, psychiatric illness, or unrequited love. Cut throat injuries are to be dealt with a multidisciplinary approach as various structures are at risk including important vessels and nerves, laryngeal framework, trachea, and hypopharynx. Timely intervention is mandatory to prevent death of the patient [4]. Prevention of these complications requires securing the airway by tracheostomy or endotracheal intubation, control of hemorrhage, and blood replacement [5]. Tracheostomy should be performed immediately when airway obstruction or chances of aspiration of blood exists [6,7].

Exploration under G.A. is the preferred surgical approach especially if there is injury to the laryngeal framework suspected. Although the sole role in identifying airway emergencies and securing the airway patency is of the otolaryngologist, the post-operative morbidity is greatly influenced by a psychiatrist. This study was conducted in our local setting to describe our own experience in the management of cut throat injuries, outlining the etiology, patterns, and treatment outcome of these injuries.

METHODS

The study involved 18 patients of cut throat injury admitted from between April 2017 and January 2020 at the Department of Otorhinolaryngology, M.D.M. Hospital, Jodhpur. This is a prospective/retrospective cohort study of all cut throat injury patients who presented at ENT emergency in MDM hospital of Dr. S.N. Medical College, Jodhpur. A total 18 consecutive cases were included in the study who were admitted in ENT ward. The details of patients including age, sex, mode of injury, anatomical sites, zones of injury, structures injured, treatment provided, and complications, were recorded systematically. Patients with cut throat injury were included in the study. Patients with blunt neck trauma, superficial penetrating neck injuries, and patients with major trauma in other parts of the body needing hospitalization were excluded from the study. The investigations such as X-ray soft-tissue neck lateral and AP view, X-ray chest PA view, and CT scan neck were done to detect any major injuries. All routine hematological investigations were done. All patients were initially managed on the basis of advanced trauma life support guidelines. Endotracheal intubation wherever possible was done otherwise an emergency tracheostomy was done below the level of injury. Once resuscitated patients were shifted to the operation theater.

During wound repair, first the wound was washed with normal saline thoroughly, looked out for bleeders, and then repaired in layers. In patients with involvement of thyroid cartilage or cricothyroid membrane injury, repair was done by approximating the cut ends with 3-0 prolene. In patients with cricoid cartilage injury, approximation of the cut ends was done by suturing the perichondrium with 3-0 prolene. In cases of transected trachea, it was sutured circumferentially with interrupted 3-0 prolene at an interval of 3-4 mm. Fascia, muscles, and subcutaneous tissue of the neck were sutured with 3-0 vicryl in layers. Skin was closed with 3-0 silk and a vacuum suction drain was inserted. Postoperatively, patients were strictly advised not to extend the neck, as it may result in wound dehiscence. Broad spectrum given to prevent infection. Regular dressings were done. Sutures were removed after 7 days. After discharge of the patients, follow-up was done for 6 months, along with endoscopic examination of the air.

Study was conducted after obtaining the permission from the Ethical Committee. Collected data were entered in the Microsoft Excel spreadsheet, coded appropriately, and later cleaned for any possible errors. The statistical analysis was carried out using appropriate statistical software.

RESULTS

Among 18 patients, there were 17 male and one female (Fig. 1). The peak age of incidence was in the 2nd and 4th decade of life (27.8%) (Fig. 2). Accidental (83.3%) cut throat injury was the most common mode of injury followed by homicidal injury (11.1%) (Table 1). Accidental fence injury came out to be the most common cause. Fifteen out of 18 patients belonged to rural areas. Most of the patients were able to reach tertiary referral center within 8 h of injury. Only 3 patients presented late after 8 h. About 65.3% of cases had injuries in the Zone II and most of them had laryngeal trauma (57.1%) (Table 2 and Fig. 3). During presentation, the majority of victims presented with open wounds (93.9%) and active bleeding (82.6%) (Table 3). Respiratory distress was seen in 12%. Laryngeal/hypopharynx repair and tracheostomy were the most common surgical procedures performed accounting for 88% (Fig. 4). Blood transfusion was needed in. Decanulation within 1 month was possible in 77%. Patients developed 64 complications of which surgical site infections (44%) was the most common complication (Fig. 5).

DISCUSSION

According to the World Health Organization (WHO), every year over 5 million people around the world die as a result of cut throat injury (Ref.). As per the WHO, it is estimated that for every death, 10-20 patients get hospitalized and 50-100 patients receive emergency care [4,8]. Management of cut throat injury is a challenging task. The most important structures such as larynx, trachea, pharynx, carotids, and nerves are present in a small confined area in the neck [9]. In this study, most of the patients were male in their second and fourth decades of life, a finding which agrees with the literature [1,2].

Aich *et al.* [4] studied 67 cut throat injuries; 47 were male and 20 were female. The majority of victims (61.19%) were young adults between 21 and 30 years of age. In our study, the most common inciting/etiological factor behind cutthroat injury was accidental. This is in contradiction to the observation of Modi and Pandey [8]. Where they observed, suicidal cut throat injuries are rare in India. In contrast, suicidal cut throat injuries were the most common cause in the western population [10]. As reported by others, majority of patients in our study presented with open wounds and active bleeding [1,2]. Iseh and Obembe [11] suggested that pharyngeal, hypopharyngeal, and laryngeal mucosal lacerations should ideally be repaired early within 24 h.

The chance of wound infection and pharyngocutaneous fistula rises with delayed repair. The worth of tracheostomy in the management of cut throat injury has been highlighted in the literature [7,8]. In our study, all victims required tracheostomy. Regarding treatment outcome some patients are living normal life after treatment, some patients are

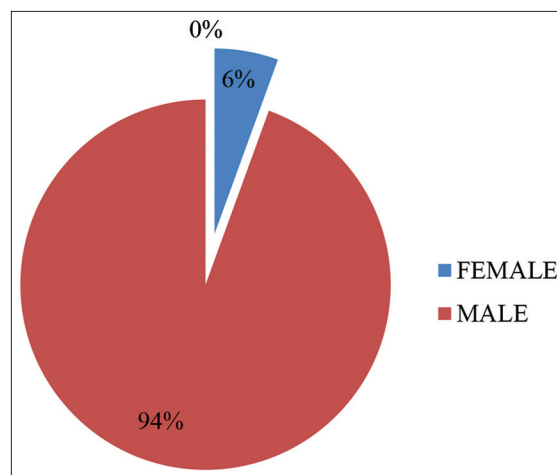


Fig. 1: Distribution of patients according to sex (n=18)

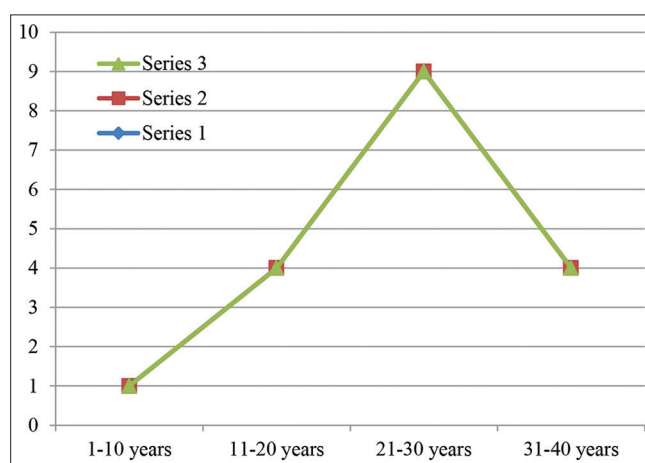


Fig. 2: Distribution of patients according to age (n=18)

Table 1: Distribution of patients according to mode of injury

Mode of injury	Number	Percentage
Suicidal	1	5
Homicidal	2	11.1
Accidental	15	83.3

Table 2: Distribution of patients according to site of injury

Site of injury	Number	Percentage
Supraglottic	6	33.3
Glottic	7	38.9
Subglottic	5	27.8

Table 3: Structures involved and presentation

Variables	Response	Percentage
Structures involved	Larynx	38
	Thyroid gland and cartilage	23
	Trachea	14
	Jugular vessels	8
Presentation	Active bleeding	82
	Hemorrhagic shock	16
	Respiratory distress	12

living with minor disability like change of voice and mild dysphagia. Laryngeal stenosis, pharyngeal stenosis, and pharyngocutaneous fistula

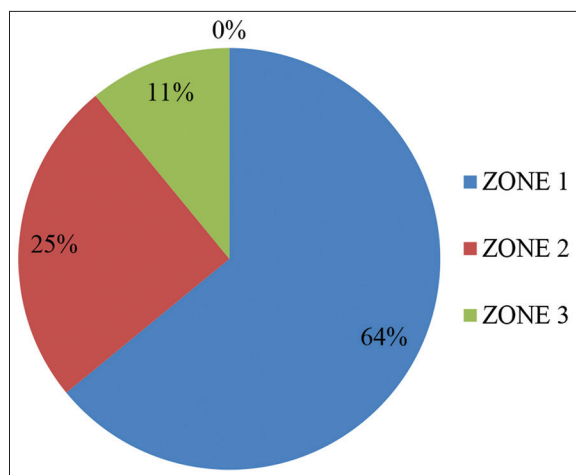


Fig. 3: Anatomical site zones

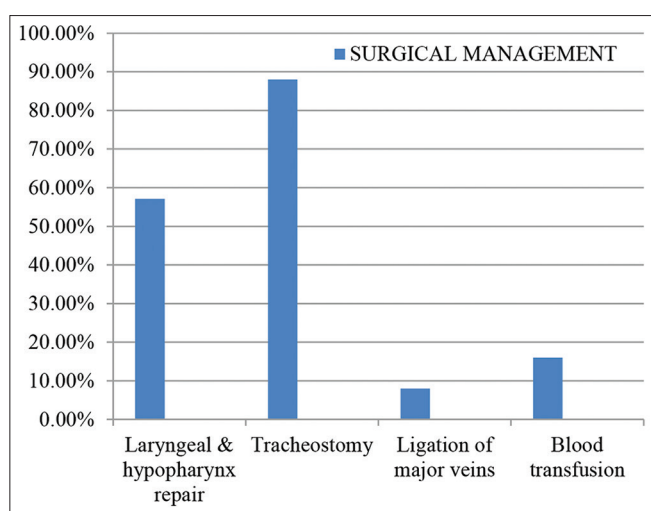


Fig. 4: Surgical management

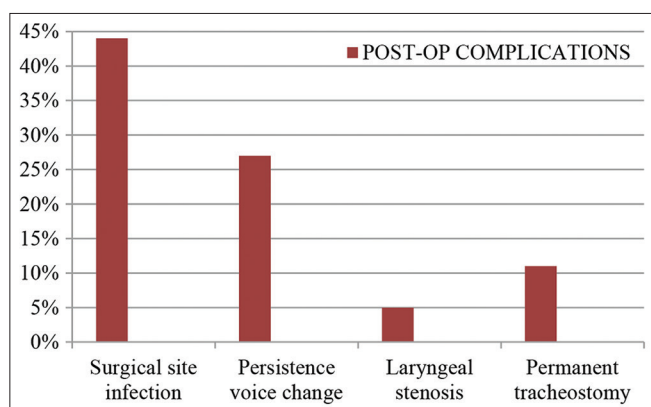


Fig. 5: Post-operative complications

are the worst complications [12]. In our study, one patient had tracheal stenosis. Pharyngocutaneous fistulae can be avoided by meticulous suturing of tissue layers, avoiding overlapping of suture lines, and choosing correct suture material. They can be prevented by Ryle's tube feeding and avoiding oral feeds, in the post-operative period [13].

CONCLUSION

Incidence of cut throat injuries and thereby the associated morbidities and mortalities are increasing in a fast rate in our society. The timely and correct management know how is essential for a successful outcome. Those patients presenting with injury involving the larynx or upper trachea need preliminary tracheostomy. This will enable the surgeon to undertake primary closure of the wound and in addition the actual site of wound gets rest necessary for early healing. The patient's alimentary needs are better managed with Ryle's tube feeding. Post-operative endoscopy is useful to identify any tracheal stenosis. Morbidity and mortality among injured patients could be reduced by increasing the emergency health care services, ambulance system, and pre-hospital care.

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AUTHORS' CONTRIBUTIONS

All the authors have contributed equally.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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