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AIRWAY EMERGENCIES IN ENT: A RETROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL

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Abstract

Background: Airway emergencies are common in ENT practice. Given the urgent nature of airway emergencies, the knowledge of the prevalence of these emergencies helps in prompt and proper management of these cases to reduce the high rate of mortality and morbidity associated with them.

Method and methodology: A retrospective analysis of all patients who presented with airway emergencies to the ENT department of Tertiary Care Hospital of Sikkim as well as to the Emergency department from August 2014 to August 2020 was done, with a total duration of 6 years. The case files of the patient ward records and the operating theatre records were the source of the data. The data collected were analysed for age, sex, presentation, diagnosis, management and outcome.

Results: Out of 35 patients who presented with airway emergencies, 32 patients fitting the inclusion criteria were studied, with the male-female ratio being 1:1.1. The age group ranged from 9 months to 80 years. Acute infections, which included retropharyngeal abscess, acute epiglottitis and peritonsillar abscess were the most common presentation (34.4%), traumatic neck injuries were the next most common presentation (31.25%), closely followed by laryngeal malignancies in the stridor (25%); and children with foreign body bronchus (9.3%). There were 2 cases of mortality recorded.

Conclusion: Airway emergencies are common in ENT practice. Patients may present with varied pathologies in any age group, and their management requires multidisciplinary and holistic approaches. Quick thinking, prompt decision, and immediate management helps decrease the high rate of mortality and morbidity associated with it.

Keywords: ENT; airway emergency; cut throat; retropharyngeal abscess; airway foreign body.

Introduction:

Airway emergencies are common in day today ENT practice. Given its urgent nature, early diagnosis and prompt management results in a reduction of morbidity and mortality.[1] Moreover, ENT emergencies require sound anatomical knowledge and special instruments for their management. With the increasing mean age of survival, people constantly being under stress due to

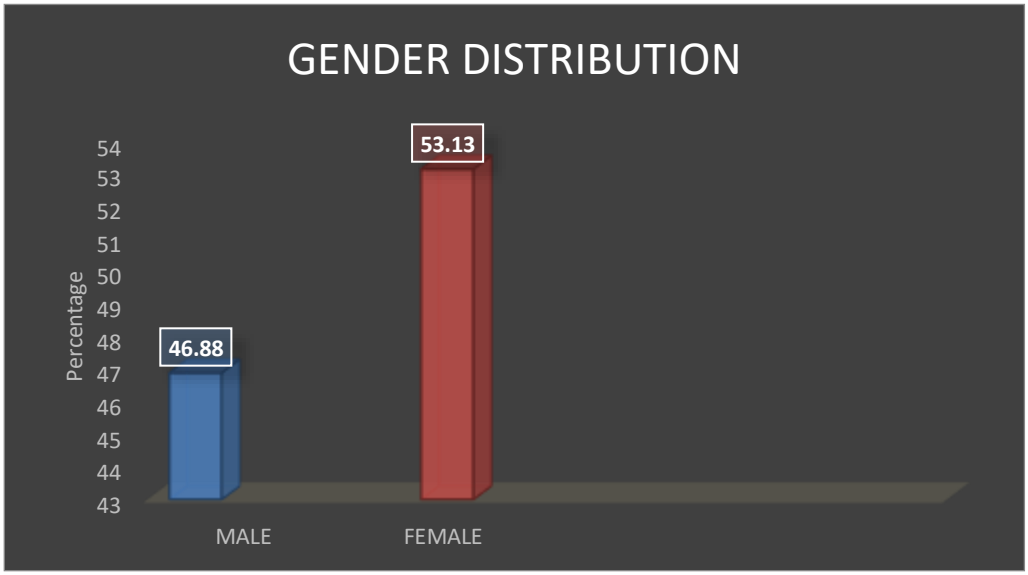
today's lifestyle, and the increasing incidence of road traffic accidents, ENT and head and neck emergencies are on the rise which poses a challenge to the attending ENT surgeon.[2]
Of all the ENT emergency, airway emergencies are the most critical and potentially life-threatening, requiring prompt management. [3][4]
Foreign body airway being the commonest especially in extremes of ages.[5][6] Other forms of emergencies include traumatic injuries like cut throat and blunt and penetrating neck injuries.[7][8]
Laryngeal malignancy can present with stridor and prompt relief of airway obstruction is essential without interference with future definitive treatment.[9]
Infective or inflammatory causes like retropharyngeal abscess, though rare, are a definitive cause of upper airway obstruction, especially in children.[10][11] Similarly, acute epiglottitis or supraglottitis possess danger due to airway obstruction.[12][13]
Hanging causes central cerebral hypoxia and death. Neck stabilisation and intubation are the first measure to be taken with tracheostomy if long term ventilatory support is needed.[14]
There is a paucity of such studies in our state of Sikkim; hence, the aim of the study is to determine the profile of these emergencies, the challenges faced, and the management required to decrease high morbidity and mortality of these conditions.

Methods and methodology:
A retrospective analysis of all patients who presented with airway emergencies to the ENT department and the casualty department of Tertiary Care Hospital of Sikkim from August 2014 to August 2020, with a total duration of 6 years, was done. The case files of patients, ward records and the operating theatre records were the source of data so collected.

Inclusion criteria: All airway emergency cases who presented to the ENT OPD as well as to the emergency department of a tertiary care hospital in Sikkim.

Exclusion criteria:
1. Patients who presented with cardiopulmonary cause of airway distress like Asthma, COPD etc.
2. Patients with incomplete records.

Results:
Out of 35 patients presenting with acute airway emergencies, a retrospective analysis of 32 patients fitting the inclusion and exclusion criteria was done.
The sex distribution is male 15(46.88%) and females 17(53.13%), with a male-female ratio of 1:1.1. Fig 1



The age group ranged from 9 months to 80 years. 0-10 years and 21-30 years are the most frequently affected. The details of age distributions are given in Table 1.

Table 1: Age wise distribution

Age (Years)	Number	Percentage
0 -10	07	21.9
11 -20	02	06.3
21 –30	07	21.9
31 -40	05	15.6
41- 50	01	03.1
51- 60	02	06.3
61-70	06	18.8
71 -80	02	06.3
Total	32	100

Among the various conditions that patients presented with infection or inflammatory (34.38%), the most common included conditions like retropharyngeal abscess (18.75%), supraglottitis (6.2%), epiglottitis (3.1%), peritonsillar abscess (3.1%), and post craniotomy patient with aspiration (3.1%). Second most common was trauma (31.25%). The various traumatic condition with which the patient presented in order of frequency were as follows: suicidal cut throat (12.5%), followed by suicidal hanging (12.5%), and penetrating injury of the neck (3.1%).
Laryngeal malignancy was the third common condition amounting to 25% followed by foreign body bronchus (9.38%). Fig 2

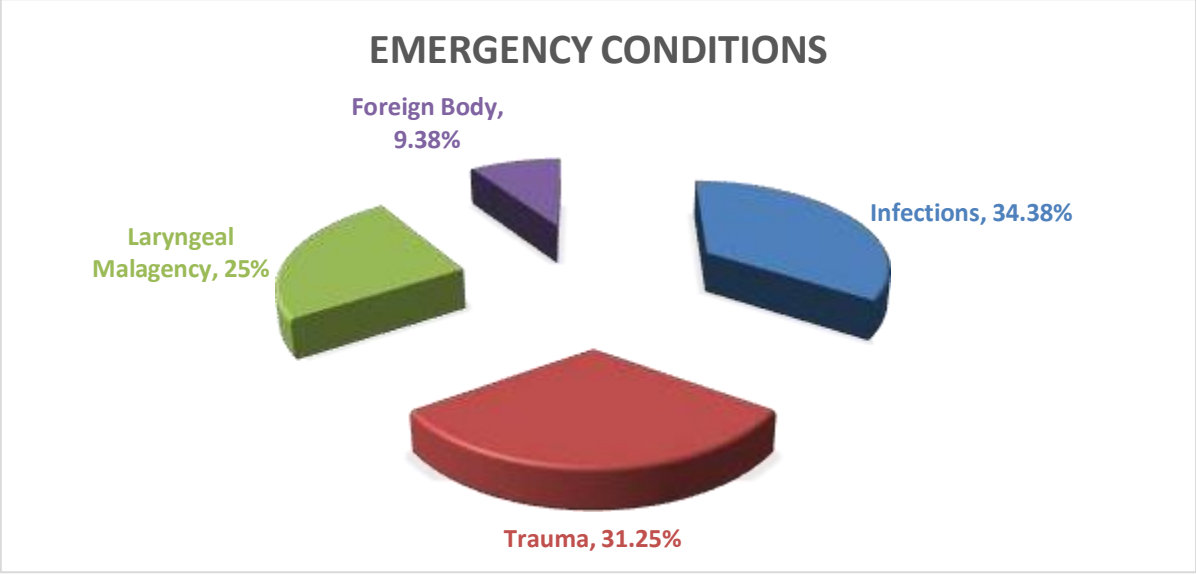


Table 2: Age distribution of the emergencies

Emergency	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total	%
Laryngeal malignancy:	0	0	1	0	1	1	3	2	8	25.0
Infectious causes:										
Retropharyngeal Abscess	4	0	0	0	0	1	1	0	6	18.7
Peritonsillar abscess	0	0	1	0	0	0	0	0	1	03.1
Acute Epiglottitis	1	0	0	0	0	0	0	0	1	03.1
Acute Supraglottitis	0	0	1	0	0	0	1	0	2	06.2
Aspiration	0	0	1	0	0	0	0	0	1	03.1
FB Bronchus:	2	1	0	0	0	0	0	0	3	09.3
Trauma:										
Penetrating injury	0	0	0	0	0	0	1	0	1	03.1
Suicidal Hanging	0	1	2	1	0	0	0	0	4	12.5
Suicidal Cut throat	0	0	2	3	0	0	0	0	5	15.6
									32	100

Children from 0 to 10 years were the ones who mostly presented with infectious or inflammatory condition, the most common being retropharyngeal abscess (12.5%).
Laryngeal malignancy is commonly seen in the elderly, i.e., in the age group 61-70 years (9.3%) and 71 -80 years (6.2%).
Traumatic injury, including suicidal cut throat and suicidal hanging, is common in the second and third decade, i.e., in the age group 21-30 and 31-40 years, respectively.

Table 3

Gender wise preponderance of ENT emergencies	**MALE**	**FEMALE**
Infectious cause	02	09
Laryngeal malignancy	05	03
Trauma	06	04
Foreign body bronchus	02	02
Total	15	17

The gender-wise distribution of different pathology is shown in Table3. Laryngeal malignancy and traumatic causes are more common in males, and infective conditions are more common in females. Emergency management of all cases were done accordingly, as depicted in Table 4. Out of 32 patients with airway emergencies, 29 patients (90.6%) underwent active surgical intervention, and 3

patients (9.3%) were managed conservatively. The 3 patients who were managed conservatively had an airway emergency of infective or inflammatory aetiology.

Table 4: Management of emergencies

Types	No. of patients
Conservative	03
Intervention	29
Tracheostomy	15
Rigid Bronchoscopy and FB removal	03
Intubation	04
Incision and Drainage	07

An emergency tracheostomy was done for all patients with laryngeal or hypopharyngeal malignancy, for patient with penetrating neck injuries, and for one post-decompressive craniotomy with aspiration.
All five patients with suicidal cut throat were managed with emergency tracheostomy and primary repair. Patients with suicidal hanging were managed by intubating the patient to secure the airway and were put on mechanical ventilation. The three foreign body bronchus who presented underwent rigid bronchoscopy and foreign body removal under general anaesthesia.
All six patients with retropharyngeal abscesses underwent intraoral incision and drainage under general anaesthesia.

Outcome: Out of 32 patients, 29 (90.6%) were successfully managed. Two deaths were noted (6.2%), one being a patient with a traumatic neck injury and the other being a case of suicidal hanging.
One patient with a retropharyngeal abscess, who, despite incision and drainage under general anaesthesia, developed complications, went home against medical advice, and his outcome could not be assessed.

Discussion:
In this study, there were total of 32 airway emergencies that required urgent attention. Out which, 3 cases (9.3%) were managed conservatively, and the rest, 29 cases (90.6%), required urgent intervention.
This study shows a slight female preponderance, unlike study conducted by Farneti P et al., which showed male preponderance.[15]
Infants and children 0 to 10 years were found to be mostly affected by infectious or inflammatory cause; trauma was most common in the age group 21 to 40 years, and laryngeal malignancy in the elderly, i.e., the age group of 60 to 80 years.
Infections and inflammatory conditions were the major cause of airway emergencies in this study, similar to other study conducted by Andrade JS et.al and Futado PL et.al., which showed similar results, whereas another study done by Hqanq SE et al. found it to be the third most common ENT emergency, first and second being epistaxis and foreign bodies of throat.[16][17][18] The main burden of infectious causes for airway emergencies in this study comprised of retropharyngeal abscess (18.7 %).
In today's scenario, due to good antibiotic coverage, the incidence of retropharyngeal abscess is uncommon; however, in our study, it was the most common cause amongst the infective and inflammatory conditions, especially in cases of children, which could be due to the fact the all these cases presented late as they were treated previously at the peripheral centres for upper respiratory tract infections and enlarged cervical lymphadenopathy. Other studies conducted by Ameh EA et al. and M.S Hari et al. came to similar conclusions. Ameh E A et al., in their study, which was a retrospective study done over a period of ten years, found retropharyngeal abscess to be more

common in children and that they presented with respiratory obstruction and had to undergo drainage either via oral route or through external cervical incision under general anaesthesia.[10][11] All the pus culture sent was sterile owing to prior administration of antibiotics either at home or at another centre from where the children were referred which corroborated with the findings of studies conducted by Ameh EA et al.[10][11]

Complications of retropharyngeal abscess, if not diagnosed early, can be devastating and can endanger the life of the patient, like respiratory obstruction, septicaemia, thrombosis of jugular vein, and mediastinum involvement, as seen in one of the patients in our study, despite intraoral incision and drainage and broad-spectrum antibiotics.

It can also lead to death of the patient from mycotic aneurysm of carotid artery and carotid blowout with massive haemorrhage. All 5 patients in our study presented late with complications of respiratory obstruction and were managed by intraoral drainage of abscess under general anaesthesia.

Other infectious causes included acute epiglottitis (3.1%) and acute supraglottitis (6.2%), which was managed conservatively with broad spectrum antibiotics, humidified oxygen, systemic steroids and other supportive measures to avert the need for intubation. Peritonsillar abscess (3.1%) was managed by incision and drainage and appropriate antibiotics with other supportive measures, and among the infectious causes, it was the least common, in contrast to a study by Timsit et al., which stated peritonsillar abscess was one of the common causes of emergency ENT admission.[15]

Traumatic injuries of the cervical region, which included suicidal cut throat (15.6%), suicidal hanging (12.5%), and penetrating neck injuries (3.1%), were the second most common presentation, and they not only presented with airway compromise but also with bleeding and vascular compromise, and they tested the expertise of the treating surgeon. Multimodality management is the norm in such cases. Cervical aerodigestive trauma is quite rare, and most centres have limited experience with its management, so a high degree of suspicion is required from the side of the treating surgeon.[7] Contradictory to a study by Vassiliu P et al. and by Grewal H et al., the most common cause of cervical region trauma causing airway compromise was gunshot wounds and stab wounds. In this study, no such cases were noted, and the most common traumatic cause being self-inflicted suicidal cut throat. The reason is that the state has one the lowest crime rates in the country.

In dealing with cut throat injuries in this study, all 5 cases were referred from Peripheral Health Centres in far-flung regions. The patients, when received in an emergency, were severely hemodynamically compromised. So, in addition to the difficult task of securing the airway, making the patients hemodynamically stable was a huge challenge that led to prolonged ICU stay for the patient. Complications seen were difficult decannulation, stenosis, loss of voice, laryngomalacia, etc.

In order to prevent the high rate of mortality in such cases, the referring unit needs to be strengthened. Emergency securing of airway and management of blood loss are the prime concerns in such cases and need to be done by the primary care physician who comes into first contact with the patient. The doctors so posted should be aware of the complications and should be well versed in emergency management of such conditions, for which they should be trained and updated time and again.

Laryngeal malignancy presenting in stridor comprised 25% of all cases and was mostly seen in the age group of 61 to 80 years, i.e., elderly population, with a male preponderance, as in another study conducted in India by Saurabh Bobdey et al., which showed similar results.[17]

Foreign body in the airway in this study were mostly seen in children, comprising 9.3% of emergencies, and had to be dealt with utmost urgency. Similar to a study conducted by HsuWc et al., which concluded that airway foreign bodies were most common in children, especially in the age group 1-3 years, they can also be frequently seen in older children as well. It can present with obscure history, and diagnosing a radiolucent foreign body can pose a challenge. In such cases, even radiological conclusion is not evident; hence, in suspected foreign body diagnostic bronchoscopy is warranted. Similarly, a sharp foreign body can test the skill of the surgeon during

removal. Rigid bronchoscopy with optical forceps, the gold standard technique for diagnostic and therapeutic management of such cases, as concluded by Hsu Wc, was also the management of choice in this study.[18]

The majority of patients were managed surgically. The various surgical interventions done, emergency tracheostomy and primary repair for suicidal cut throat , intubation for suicidal hanging, emergency tracheostomy to secure airway in case of penetrating neck injury ,incision and drainage with intubation for retropharyngeal abscess , incision and drainage for peritonsillar abscess, emergency tracheostomy as the initial step to secure the airway in cases of laryngeal malignancy prior to definitive treatment, rigid bronchoscopy and foreign body removal for foreign body trachea and bronchus.

Three cases (9.3%) of infectious origin, which included two cases of acute supraglottitis and one case of acute epiglottitis, were successfully managed conservatively.

There were 2 cases (6.2%) of mortality recorded. One being the case of penetrating neck injury following a fall. The patient underwent emergency tracheostomy to secure the airway but succumbed due to massive blood loss, causing hemodynamic compromise. Another was a case of suicidal hanging who was intubated but died due to respiratory failure as a result of cerebral hypoxia.

Infectious or inflammatory causes were found to be the most common aetiology presenting in children and young adults.[19][20] Followed by trauma as a cause of acute airway emergency in patients of second and third decade, with laryngeal malignancy causing stridor seen in elderly population. Foreign bodies of airway are more common in children.[21][22]

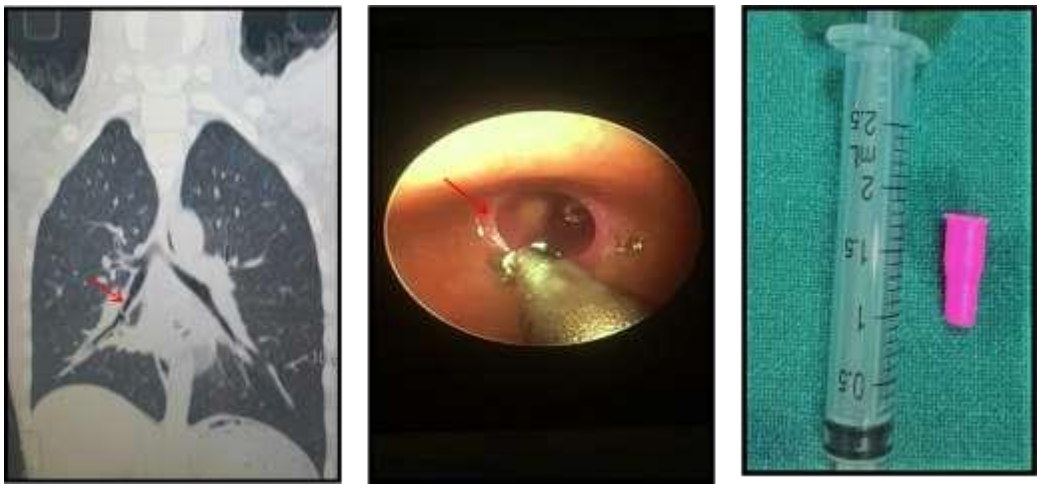


Fig 3: Foreign body right bronchus

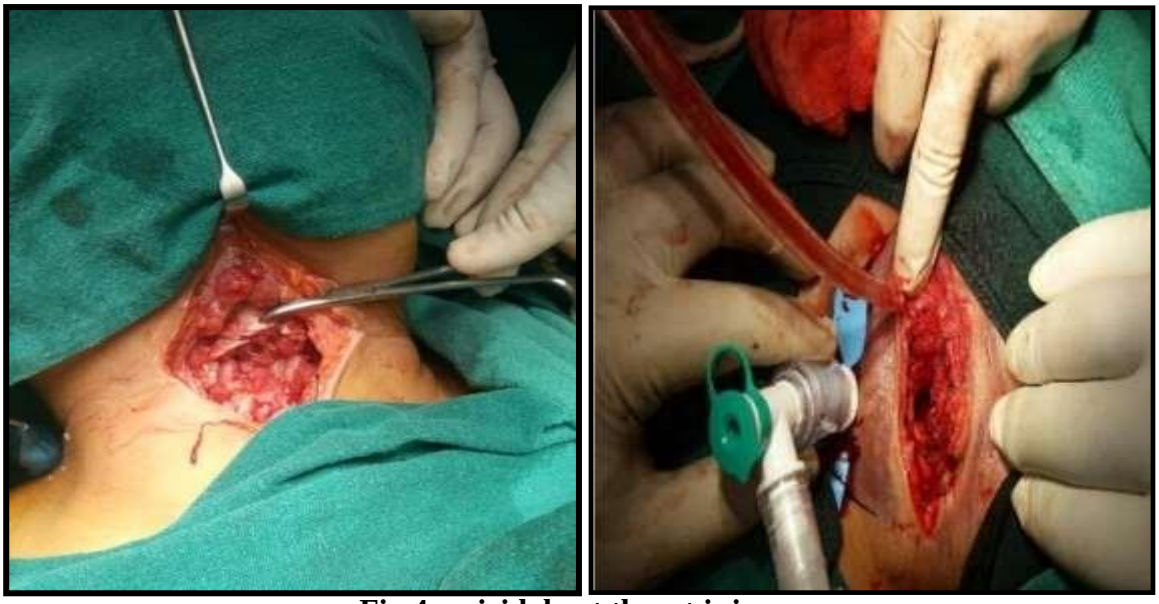


Fig 4: suicidal cut throat injury

Fig 5: Retropharyngeal abscess

Conclusion:

Airway emergencies are quite common in ENT practice, with patients presenting with varied pathologies and in any age group; hence, their management requires multidisciplinary and holistic approach as well as a good investigative support system and the expertise and competency of the treating surgeon. Quick thinking, prompt decisions, and immediate management helps decrease the high rate of mortality and morbidity associated with it. Knowledge of the prevalence of these emergencies further aids in management of such cases.

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Consent for publication Written and well-informed consent for the publication was obtained from all the participants

Competing Interests: None.

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