# Laryngeal Trauma in Port Harcourt: A Review of 68 Cases

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**Abstract**

**Background:** Head and neck injuries with associated laryngeal trauma appear to be on the increase nowadays with most patients presenting with features of acute upper airway obstruction. This study determined the sources of laryngeal trauma, clinical profile, complications and management outcome.

**Patients and methods:** This was a retrospective study carried out in the University of Port Harcourt Teaching Hospital (UPTH). Case notes of patients that presented through the accident and emergency department with neck trauma involving the larynx and surrounding tissues between September 2004 and August 2009 were retrieved and used for this study. Out of 200 patients only 68 had neck trauma with laryngeal involvement. Patients who had laryngeal trauma from corrosives were excluded from this study. Demographic data, cause of injury, clinical features, complications and outcome of treatment were recorded and analyzed.

**Results**: Out of 200 patients with various neck traumas, 68 (34%) were noted to have laryngeal involvement. The age range of the patients was 15-65years. The younger age groups were mostly affected, especially males. Gunshot wounds and Road Traffic Accident (RTA) dominated (n=58, 85.30%) the picture and presenting with upper airway obstruction. Majority (n=60, 88.24%) of patients were successfully managed without complication. No mortality was recorded in our series but a few (n=8, 11.76%) had chronic laryngotracheal stenosis.

**Conclusion:** Trauma to the larynx arising from gunshot wounds to the neck due to violence was found to be a major problem among the youth in Port Harcourt. Government intervention with gainful employment and provision of infrastructure are strongly advised to reduce the incidence of laryngeal trauma.

***Key words:*** *Laryngeal trauma, Head and neck injuries, Upper airway obstruction, Port Harcourt*

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## Introduction

The larynx functions as an airway to the lungs, voice production, and fixation of the chest when lifting heavy objects and injuries to the larynx are rare but when it does occur it poses serious danger to the patient [1, 2]. When there is severe injury to the larynx, airway is usually compromised and the patient most times presents with features of acute upper

airway obstruction [1,3]. Speech even though it is affected does not present as an emergency and could be handled after settling the life threatening conditions. Acute Laryngeal trauma with its associated airway obstruction is an otolaryngological emergency requiring immediate intervention to prevent morbidity and mortality [4].

Laryngeal trauma has several classifications; it can either arise from penetrating or blunt injuries which can be further categorized as either high or low velocity [3]. Besides, it could be closed or open. Most commonly, trauma to the larynx occur as a result of road traffic accident (RTA) [5]. In open injuries the laryngeal cartilage can be visualized at close examination of the neck. Sharp objects like table knives, broken bottles and gun shots are notable causes of open laryngeal injuries [3]. Sometimes there are no obvious external injuries to the anterior neck. However, laryngeal edema and possible laryngeal cartilage fracture may become obvious with time [6,7]. This type of closed laryngeal injuries may arise from contact sports and blows.

Since there are different mechanisms of injuries, the clinical presentation may become unpredictable. Patients could present with any of the following: hoarseness, pain around the neck, dysphonia, dysphagia, aphonia and odynophagia [8]. Common signs include stridor, subcutaneous emphysema, hematoma, laryngeal tenderness and sometimes vocal cord immobility [8].

Some authors have suggested routine use of computed tomography (CT) scans for all laryngeal trauma [9, 10] because it gives better anatomical information and assists in preoperative planning. However, there are a number of authors who suggest selective use of CT scans because they believe that CT scans are irrelevant in cases where surgical intervention is clearly necessary, e.g. massive edema, exposed cartilage and displaced fracture [10].

There has been an alarming increase of violence in the Port Harcourt with reported cases of laryngeal trauma. Meanwhile, literature search revealed paucity of information in our environment; hence this study was carried out to determine the sources of laryngeal trauma, clinical profile, complications and management outcome. Besides, it will serve as a baseline for researchers to carry out further studies to improve on the already existing knowledge.

## Patients and methods

This is a 5 year retrospective study carried out in the University of Port Harcourt Teaching Hospital, Rivers State which serves as a referral center for the neighboring states of the Niger Delta Region. The study period was from September 2004 to September 2009. Patients used in the study were those involved in neck trauma associated with laryngeal injury. Those without laryngeal involvement were excluded, as well as those who had trauma from corrosives. All the patients first presented to the Accident and Emergency (A/E) department before referral to the Ear, Nose and Throat (ENT) surgery department. Records from the ENT surgery department and theatre records were retrieved to augment the data.

Out of 200 neck trauma cases that presented to A/E. Sixty eight patients had laryngeal injuries. The case notes of these patients were retrieved. The age, sex, source of injury, nature

of injury, clinical presentation, treatment modalities and complications as well as radiological investigation were properly recorded. Simple statistical tables were used to illustrate the data. Categorical data were expressed as mean, mode and standard deviation. Data analysis was done using SPSS for windows 15.

## Results

Out of 200 patients with various neck traumas, 68 (34%) had laryngeal involvement including soft tissue around the larynx. The age range of the patients was 11-65 years with a mean of 31.59 ± 10.71 years. There were 45 males and 23 females with a male: female ratio of 1.9:1. The younger age groups were mostly affected. The age range 21-30years has the highest (n=30, 44.12%) incident (Table 1). Gunshot injuries accounted for the highest (n=42, 61.76%) incidence. Out of 42 patients with gunshot injuries, 35 of them sustained laryngeal trauma as a result of youth restiveness while the remaining 7 were victims of armed robbery attack.

Suicidal attempt recorded the least (n=1, 1.47%) number of patients (Table 2). Most (n=40, 58.82%) of the patients presented with upper airway obstruction and exposed laryngeal cartilage (Table 3). Open neck injury

*Table 1: Age distribution of patients*

| Age range | Number of patients | Percentage (%) |
|---|---|---|
| 11-20 | 5 | 7.35 |
| 21-30 | 30 | 44.12 |
| 31-40 | 20 | 29.41 |
| 41-50 | 8 | 11.77 |
| 51-60 | 4 | 5.88 |
| 61-70 | 1 | 1.47 |

*n=68*

*Table 2: Patients source of injury*

| Source of injury | Number of patients | Percentage (%) |
|---|---|---|
| Knife cut | 8 | 11.76 |
| Gun shot | 42 | 61.77 |
| RTA | 17 | 25.00 |
| Suicidal attempt | 1 | 1.47 |

*n=68*

**Table 3:** *Clinical presentation of patients*

| Clinical presentation | Number of patients | Percentage (%) |
|---|---|---|
| Open neck injury with exposure of the laryngeal skeleton, stridor | 40 | 58.82 |
| Neck swelling with stridor | 12 | 17.65 |
| Open neck injury no stridor | 10 | 14.71 |
| Open neck injury, neck swelling with stridor | 6 | 8.82 |

*n=68*

*Table 4: Modalities of patient's treatment*

| Treatment | Number of patients | Percentage (%) |
|---|---|---|
| Tracheostomy, neck exploration and wound closure | 25 | 36.76 |
| Neck exploration and wound closure | 15 | 22.06 |
| Tracheostomy alone | 18 | 26.47 |
| Wound closure alone | 10 | 14.71 |

*n=68*

with exposure of laryngeal cartilage and airway obstruction accounted for 58.82% patients. Most (n=40, 63.24%) patients had tracheostomy (Table 4). The commonest (n=25, 36.76%) mode of treatment was tracheostomy, neck wound exploration and wound closure (Table 4). All the patients had plain radiographs of the neck and chest but only a few (n=12, 17.65%) had remarkable findings in plain Radiograph of the anterior and lateral aspect of the neck. The findings were suggestive of subcutaneous emphysema and soft tissue swelling. Most (n=60, 88.24%) patients were discharged home without sequelae while a few (n= 8, 11.76%) developed laryngotracheal stenosis.

## Discussion

Young individuals especially males were found in our study to be mostly involved in laryngeal trauma. Gunshot injuries were found to be the commonest cause of laryngeal trauma. This could be ascribed to their greater participation in youth restiveness as they demand for better infrastructures and means of livelihood. On the other hand, Shabbir and Sohail [11] in their study revealed that young individuals especially males with laryngeal injuries were mainly associated with road traffic accidents. Another study in Singapore also identified RTA as a major source of laryngeal trauma [12].

Furthermore, our study revealed a male predominance which agrees with several studies done in the past [2, 3]. The commonest clinical presentation in our study was open neck injury with exposure of laryngeal cartilage and stridor. This has also been documented by other researchers [13-15]. These patients had tracheostomy, wound exploration, repair of tissues and wound closure.

There has been controversy over the use of tracheostomy prior to surgical treatment. Some researchers prefer endotracheal intubation while others will insist on tracheostomy before neck exploration and wound closure [8, 15-17]. In airway management usually endotracheal intubation is used as a first line of action before considering tracheostomy [1, 18-19]. If it fails then one can carry out an emergency tracheostomy [20]. Conversely, some researchers have argued that endotracheal intubation in patients with laryngeal trauma could be hazardous [3, 16, 18]. In this study an initial tracheostomy was very safe especially in the cases where the larynx were exposed. We are aware of other methods of initial airway management such as laryngeal mask and cricothyroidotomy [1] however; we did not make use of them. None of our patients did CT scan of the neck because of lack of funds. However; a few did radiographs of the neck anterior and lateral views which showed evidence of emphysema and soft tissue shadow that obscured the laryngeal inlet. There was no need to do initial radiographs for the patients that presented with open wounds exposing the laryngeal frame work.

The majority (n=60, 88.24%) of our patients recovered without complications however, a few (n=8, 11.76%) had chronic laryngotracheal stenosis. Two of them had it while on admission and the other 6 had it four weeks after discharge. Unfortunately, they could not be weaned off the tracheostomy tubes. It is common knowledge that chronic laryngotracheal stenosis more often than not complicates laryngeal injuries and most of the patients end up carrying the tracheostomy tubes for life except when they undergo further surgeries to manage the stenosis [1, 4]. Our patients that have complications were referred to other centers for further expert management due to lack of appropriate facilities.

## Conclusion

Trauma to the larynx arising from gunshot wounds to the neck due to violence was found to be a major problem among the youth in Port Harcourt with majority of them presenting with life threatening complications. Furthermore, unsuccessfully managed cases may lead to laryngotracheal stenosis with its associated challenges in management. Therefore, early presentation to the hospital and prompt intervention by the otolaryngologist will certainly help to reduce the complications associated with laryngeal trauma. Besides, government intervention with gainful employment and provision of infrastructure are strongly advised to curb the incidence of laryngeal trauma in our environment.

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