

## Anterior Neck Injuries Presenting as Cut Throat Emergencies in a Tertiary Health Institution in North Western Nigeria

1. Iseh K.R. FWACS, 2. Obembe A. FWACP

Departments of 1.Ent, and 2. Psychiatry  
Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto.

### ABSTRACT

**BACKGROUND:** Anterior neck injuries vary in pattern and aetiology and may pose management challenges if not fatal.

**AIMS AND OBJECTIVES:** To describe patterns of anterior neck injuries in a tertiary hospital north western Nigeria.

**MATERIALS AND METHODS:** This is a prospective study of all cases of anterior neck injuries presenting as cut throat emergencies that were referred from accident and emergency department to the department of otorhinolaryngology over a nine year period (September 1999 to August 2008).

**RESULTS:** A total number of 19 cases were seen. All were males whose age range was from 5 years to 60 years with a mean age of 21.2 years. About 78.9% of the patients were within the 2<sup>nd</sup> to 4<sup>th</sup> decades of life with a peak at the 4<sup>th</sup> decade (31.6%). Ten (52.6%) patients were cases of attempted suicide with known background of psychiatric illness, Five (26.3%) were homicidal (3 under the influence of illicit drugs), two (10.5%) were from animal assault while one was as a result of road traffic accident and another one from fall on sharp object. Patients with attempted suicide had deep open wounds exposing the pharynx, larynx or both with horizontally positioned incision wounds while homicidal cases had obliquely positioned incision wounds. Restoration of normal neck, pharyngeal and laryngeal architecture was carried out through meticulous surgical repair of various tissue layers with nasogastric tube in situ for 7-9 days. Psychiatric evaluation and treatment were carried out concurrently with patients who attempted suicide and homicide. Two patients required tracheostomy to prevent upper airway obstruction from severe laryngeal trauma.

**CONCLUSION:** Significant proportion of emergencies from anterior neck cut throat injuries in this study were from suicidal attempts (52.6%) by people with a background history of psychiatric illness, followed by attempted homicide (26.3%) and animal assault (10.5%). Prompt surgical repair and concurrent psychiatric evaluation in attempted suicide and homicide is required.

**KEY WORDS:** Anterior neck injury, Cut throat, surgical repair, Psychiatric evaluation

### INTRODUCTION

Anterior neck injuries are varied in extent, depth and causes. They may be intentional or accidental<sup>1,2</sup>. The injuries may be penetrating or non penetrating blunt trauma involving the soft tissues, cartilage, bones and neurovascular bundles or in combinations depending on the extent of the injury and force of impact. The wound may be superficial or deep and the causes are varied such as road traffic accident, industrial accident, domestic accidents, sports, suicides or homicides using different objects. Approximately 5% to 10% of all traumas involves penetrating neck trauma, with multiple structures being injured in 30% of patients<sup>3-5</sup>. Compounding difficulties in evaluation and management is the complicated anatomy of the area, in which a dense concentration of vital vascular, aerodigestive, and nervous system structures are located within a very small space. Thorough knowledge of the anatomy of the neck, physical assessment, and expeditious decision making often is required to prevent catastrophic airway, vascular, or neurologic sequelae<sup>3-5</sup>. Overall mortality because of penetrating neck trauma is as high as 11%<sup>3-5</sup>. Injury to certain anatomic structures (e.g., the carotid or subclavian vessels) may be fatal in two thirds of cases<sup>3-5</sup>.

The management of injuries to the neck that penetrate the platysma is dependent upon the anatomic level of injury<sup>4,6</sup>. Anatomically, the neck can be divided into three major zones in order to aid in the decision making for diagnostic tests and timing of surgery<sup>4,6</sup>. Zone I is below the cricoid including the thoracic inlet, is treated as an upper thoracic injury and represents a dangerous area because the vascular structures in this zone are in close proximity to the thorax. Zone I has a fairly high mortality rate of 12%<sup>4</sup>. Zone II is between Zones I and III, is the area of controversy. Because of the density of vital structures in this zone, multiple injuries are common. It is the most frequently involved region (60% to 75%). Zone III is located above the angle of the mandible and is usually treated as head injury. This paper highlights pattern of anterior neck injuries presenting predominantly as cut throat emergencies to the department of otorhinolaryngology of a tertiary teaching hospital that was mainly in zone II in north western Nigeria and compares this pattern with other parts of the world.

## MATERIALS AND METHOD

This is a prospective study of all cases of anterior neck injuries presenting as cut throat emergencies that were admitted and managed over a nine year period from september 1999 to August 2008. They were analysed for age, sex, cause of injury, type of injury and surgical methods of management and for complications. The patients were admitted through the accident and emergency unit where preliminary assessment and basic resuscitative measures were carried out including tetanus prophylaxis.

The psychiatrist reviewed all patients with history of attempted suicide and homicide and gave clearance for surgery to be carried out in order to avoid undue violent behaviours. Thereafter with informed consent, patients were taken to the operating theatre where the neck injuries were explored and repaired accordingly. One was repaired under general anaesthesia while others were carried out under mild sedation with local infiltration with xylocaine/adrenaline preparation.

Nasogastric tube(NGT) was passed intraoperatively and postoperatively patients were placed on nil by mouth for 7days , but were commenced onNGT feeding after 24 hours . Liquid milk was given orally around the tube on the 9<sup>th</sup> post operative day and if there was no evidence of leakage through the operation site for 24 hours, patients were extubated and commenced on graded fluid and semisolid diet for another week. Psychiatric treatment was carried out in known psychiatric cases before and after discharge. All patients were discharged within 10 days of operation once oral feeding was established with no evidence of pharyngo-cutaneous fistula.

## RESULTS

A total number of 19 cases of anterior neck injuries from cut throat were seen over the period of review. All were males with age range from 5 to 60 years with a mean of 21.2years. The bulk of the patients were from the 2<sup>nd</sup> to 4<sup>th</sup> decades (78.9%) of life with a peak at the 4<sup>th</sup> decade

(31.6%)Table 1 .

**Aetiology:** Ten (52.6%) injuries were as a result of attempted suicide with a background history of psychiatric disorder on irregular treatment,5 (26.3%) were due to human assault who attempted homicide(three of whom were under the influence of cannabis),2(10.5%) were from animal assault while the remaining 2 were as a result of road traffic accident and fall on sharp object(table 2).Sharp knife(68.4%) was used in all cases of attempted suicide and 4 cases of human assault, while cow horn was the object involved in animal assault. Bullet from gun shot was the object used in one case while fall on a sharp pointed object was responsible for the only paediatric case(5years old).Table 2.

**Type and site of wounds:** All patients in this study had open wounds in zone 11 exposing either the hypopharynx, larynx or both (figures 1,2,3). Suicidal patients had horizontally positioned anterior incisional wounds which were deeper when compared to others. Homicidal cases had obliquely positioned incisional wounds that were more laterally placed with multiple wounds implying that the victim had engaged the assailant in self defence.

Restoration of normal pharyngeal and laryngeal architecture without compromise of food passage and airway was carried out through meticulous surgical repair of various tissue layers.

Psychiatric evaluation and treatment where necessary, were offered concurrently. Only two required a tracheostomy to prevent upper airway obstruction from severe laryngeal trauma. Only one case was repaired under general anaesthesia while all others were repaired under sedation and infiltration with local anaesthesia.

**Outcome:** Two (10.5%) patients died in this series. One had associated cervical spine injury from road traffic accident while the other had hypovolemic shock due to

Table 1: Showing age range

Age Range(years)	No (%)
0-10	1 (5.3%)
11-20	4 (21.0%)
21-30	5 (26.3%)
31-40	6 (31.6%)
41-50	2 (10.5%)
51-60	1 (5.3%)
TOTAL	19(100.0%)

Table 2: Showing Aetiology, age range & object used

AETIOLOGY	NO (%)	AGE RANGE (YRS)	MEAN AGE (YRS)	OBJECT INVOLVED
Attempted Suicide	10(52.6%)	20-60	33.9	Knife (10)
Human Assault	5(26.3%)	18-35	25.8	Knife(4) Gun (1)
Animal Assault	2(10.5%)	30-35	32.5	Cow horn
Road traffic accident	1(5.3%)	35	35	vehicle
Fall on sharp object	1(5.3%)	5	5	sharp object
<b>Total</b>	19(100.0%)			

severe haemorrhage. All others had excellent wound healing and restoration of normal anatomical structures without pharyngeal or laryngeal stenosis.

## DISCUSSION

Anterior neck injuries presenting as cut throat emergencies may be fatal if major blood vessels of the neck are involved, resulting in haemorrhage and hypovolaemic shock or if there is aspiration of blood or severe airway obstruction from edema and fractured laryngeal skeleton<sup>1-5</sup>. One patient in this study died of haemorrhagic shock while the second who died was as a result of cervical spine injury. If a cervical spine injury is suspected, neck stabilization and immobilisation is required.

Evaluation of the airway should be the first priority for all patients. If the airway is unstable, and there is significant bleeding or edema in the oral cavity or pharynx, the patient should undergo cricothyroidotomy or urgent tracheotomy. Only two patients out of the nineteen patients in this study had tracheostomy carried out on them. Ezeanolue carried out tracheostomy in all 4 patients with cut throat injuries reported<sup>7</sup>. Okoye carried out tracheostomy in all 3 cases he reported in his study and advocated the routine use of tracheostomy in all patients<sup>2</sup>. Ladapo also did tracheostomy in all his patients<sup>1</sup>. Bhattacharjee et al reported that tracheostomy was carried out in 15 out of the 26 cases in their study<sup>8</sup>.

We do not consent to routine use of tracheostomy in all patients with cut throat anterior neck injuries. Every case should be assessed based on the extent of the injury, the expertise of the surgeon and the resources available to handle airway problems. Modern advances in timely reconstructive surgery based on adequate knowledge of the anatomy of the region and several flap options, can bring about satisfactory closure of such wounds primarily. Similarly advances in fiberoptic intubation and airway management has reduced considerably the need for routine tracheostomy for patients with airway problems since tracheostomy has its own attendant complications if not properly managed<sup>9</sup>.

Exposure of the hypopharynx, larynx and trachea from cut throat injuries requires timely and meticulous surgical layer by layer repair to restore the continuity of the aerodigestive tract without complications. Appropriate surgical technique becomes necessary to ensure that airway, laryngeal function (voice and protection of the lower airway) and food passages are adequately preserved. Pharyngeal, hypopharyngeal and Laryngeal mucosal lacerations should ideally be repaired early (within 24 hours)<sup>10-11</sup>. According to Leopold, the time elapsed before repair of laryngeal mucosa lacerations has an effect on both airway stenosis and on voice<sup>10</sup>. Significant glottic and supraglottic lacerations and displaced cartilage fractures need

surgical approximation<sup>10-11</sup>. Ezeanolue reported significant laryngotracheal stenosis as a long term morbidity suffered by two of the patients in his study<sup>7</sup>. In severe penetrating neck injuries from gun shots, endoscopy and computerised tomographic (CT) scan if available will differentiate between the patients that need only observation (small laceration, shallow laceration, nondisplaced fracture) and those that require a thyrotomy or open fracture reduction and mucosal approximation<sup>12</sup>. A soft laryngeal stent may be needed for badly macerated mucosa.

Pharyngo cutaneous fistula must be prevented as much as possible while carrying out pharyngo-hypopharyngeal repair. This requires meticulous approximation of the tissues, use of NG tube and nil oral feeding for a minimum of 7-9 days. Should there be a pharyngo-cutaneous fistula, NG tube feeding must continue for as long as possible until the fistula closes as a conservative approach to management. If the fistula persists for more than 6 weeks, one must exclude the possibility of presence of a foreign body, wrong surgical technique, malnutrition or a concomitant underlying concealed malignancy especially in the elderly. Such extreme cases may need flap closure using local, regional or distant flaps after excision of the fistula.

Continuous psychiatric monitoring is essential in all cases of attempted suicide and homicide otherwise a repeat incidence may reoccur which may be fatal. Ladapo reported a case who was ready to commit suicide again if given another opportunity. Bhattacharjee et al. mentioned family troubles, psychiatric illness and poverty as the triggering factors in suicidal attempts<sup>8</sup>. All cases of suicidal attempts in this study were known psychiatric patients who were on irregular medications. Three cases of attempted homicides were under the influence of cannabis highlighting the negative effects posed by continuous use of illicit drugs in our society requiring surgical intervention. According to Harrison et al, cannabis is known (often at small dose levels), however to impair memory function, distort perception, impede judgement and reduce motor skills<sup>13</sup>. Such effects are most often likely to manifest their negative consequences upon the young. Shedler et al in a longitudinal survey of adolescents reported that adolescents who used illicit drugs (cannabis) frequently were maladjusted, showing distinct personality syndrome marked by interpersonal alienation, poor impulse control, and manifest emotional distress<sup>14</sup>. Spunt et al reported that marijuana (cannabis) was the most common illicit drug (86%) used by a sample of 268 murderers incarcerated in New York state correctional facilities for homicides that occurred in 1984<sup>15</sup>. About one-third of the prisoners (33%) had used marijuana in the 24-hour period before the homicide and that almost three-quarters (70%) of those respondents were

experiencing some type of effect from the drug when the homicide occurred. Eighteen respondents (7% of the total sample) said the homicide was related to their marijuana use<sup>15</sup>.

Animal attack with cow horn occurred in 2 patients with significant damage to the anterior neck requiring surgical repair in this study may be under reported because our centre is a tertiary health institution which receives only apparently difficult cases being referred to the centre. Cattle is widely used both for domestic and commercial purposes in this environment and animal injuries sustained from cattle is a common feature in many rural areas that may not be brought to our centre except very severe. Gun shot which was used to settle political scuffle was reported in one case in this study while the only child in this study (5years) with cut throat injury fell on a sharp object.

Complications of Anterior neck injuries could be classified as immediate, intermediate and delayed<sup>1,3-5,12</sup>. Immediate complications include:

1. Respiratory obstruction from:
  - a) Fractured hyoid bone, thyroid, cricoids or tracheal cartilages pushed posteriorly.
  - b) Slit base of tongue falling over the laryngeal inlet.
  - c) edema or haematoma in or around the larynx.
  - d) Flooding of the air passages and patient drowning in his blood.
2. Air aspiration into the neck veins and embolisation
3. Profuse haemorrhage and hypovolaemic shock.

Intermediate complications include:

1. Respiratory obstruction due to surgical emphysema
2. Non-specific infections like cervical cellulitis, perichondritis and mediastinitis.
3. Tetanus and gas gangrene in contaminated wounds.
4. Aspiration pneumonitis due to loss of laryngeal afferents or motor control in the protective cough reflex or tracheo-esophageal fistula
5. Pharyngo-cutaneous or trachea-esophageal fistula.
6. Chyle or lymph fistula.

Delayed complications include:

1. Aphonia, dysphonia or hoarseness
2. Stenosis of the aerodigestive tract
3. Aneurysmal formation or arterio-venous fistula
4. Hypertrophic neck scar
5. Psychological trauma

In conclusion, Anterior neck injuries presenting as cut throat emergencies vary in aetiology, extent, and depth. All were males who were predominantly young people with significant proportion due to attempted suicide in known psychiatric patients (52.6%) and influence of cannabis (15.8%). Concurrent psychiatric assessment along with prompt meticulous layer by layer surgical repair within 24 hours of the injury and stepwise post operative management with NG tube is advocated to

avoid long term complications of pharyngo-cutaneous fistula, aerodigestive tract stenosis which will require series of long term reconstructive measures to restore normal functions of the aerodigestive tract and closure of the fistula.

## REFERENCES

1. Ladapo AA: Open injuries of anterior aspect of the neck. *Ghana Med Journal* 1979;4:182-6
2. Okoye BC, Oteri AJ. Cut throat injuries in PortHarcourt. *Sahel Med Journ* 2001;4:207-209.
3. Kendall JL, Anglin D, Demetriades D. Penetrating neck trauma. *Emergency Medicine Clinics of North America* 1998; 16:85-105.
4. Biff WL, Moore EE, Rehse DH, Offner PJ, Franciose RJ, Burch JM. Selective management of penetrating neck trauma based on cervical level of injury. *American Journal of Surgery* 1997;174:678-82.
5. Demetriades D, Asensio JA, Velmahos G, Thal E. Complex problems in penetrating neck trauma. *Surgical Clinics of North America* 1996;76:661-83.
6. Bumpous JM, Whitt PD, Ganzel TM, McClane SD. Penetrating injuries of the visceral compartment of the neck. *American Journal of Otolaryngology*. 2000;21:190-194.
7. Ezeanolue BC. Management of the upper airway in severe cut throat injuries. *African Journal of medicine and medical sciences* 2001;30:233-5.
8. Bhattacharjee N, Arefin SM, Mazumder SM, Khan MK. Cut throat injury : a retrospective study of 26 cases. *Banladesh Med Res councl. Bull* 1997;23:87-90.
9. Davies JR. The fiberoptic laryngoscope in the management of cut throat injuries. *British journal of Anaesthesia* 1978;50:511-514.
10. Leopold DA: Laryngeal trauma, *Arch Otolaryngol* 1983; 109:106-109.
11. Cherian TA, Rupa V, Raman R. External laryngeal trauma: analysis of 30 cases. *JLO* 1993;107:920-923.
12. Naaeder SB. The neck. In: Badoe EA, Archampong EQ and da Rocha-Afodu JT eds. *Principles and Practice of surgery including Pathology in the Tropics*, 3<sup>rd</sup> edition. Tema, Ghana: Ghana Publishing Corporation Publishers 2000;339.
13. Harrison LD, Backenheimer M, Inciardi JA, Cannabis use in the United States: Implications for policy. In: Cohen P & Sas A (eds). *Cannabisbeleid in Duitsland, Frankrijk en de Verenigde Staten*. Amsterd Centrum voor Drugsonderzoek, Universiteit van Amsterdam 1996:198-205.
14. Shedler J, Block J. Adolescent drug use and psychological health: A longitudinal inquiry. *American Psychologist* 1990;45(5):612-630.
15. Spunt B, Goldstein P, Brownstein H, Fendrick M. The role of marijuana in homicide. *International Journal of the Addictions* 1994;29(2):195-213.