

# **Traumatic Gastric Injury: A 10 year Experience in University Teaching Hospital Jos**

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## **Abstract**

**Background:** Traumatic gastric injury is a lethal form of hollow viscera injury following trauma.

**Objective:** To determine the pattern, management modalities and treatment outcome of traumatic gastric injury in Jos, Nigeria.

**Methods:** A retrospective study of patients who presented to our hospital following trauma with operative findings of gastric injury, from November, 2010, to December, 2020.

**Results:** Of the 55 patients that presented over the 10-year period, 48(87.3%) were males and 7(12.7%) females. Age ranged from 6-40 years, with a mean of 25.6 years. There were 31(56.4%) from gunshots, 18(32.7%) stabs and 6(10.9%) from RTA. Injuries to the stomach alone were 18(32.7%) while the remaining had injuries to other abdominal organs as well, the highest being the small intestine (23.6%). Duration of hospital stay ranged from 3 hours to 52 days with a mean of 19.4 days. More than half of the 30(54.6%) complications were infective. There were 3(5.5%) mortalities, all of which presented more than 24 hours after the trauma.

**Conclusion:** Traumatic gastric injury commonly involves young adult males, and commonly from penetrating mechanism mainly from firearms. Morbidity and mortality are highly dependent on delayed presentation.

**Keywords:** Gastric injury, Trauma, Jos University Teaching Hospital

## **Introduction**

Traumatic gastric injury is the most lethal of hollow visceral injury following trauma to the abdomen [1]. This is because injury to the stomach is usually associated with other injuries and the resultant haemodynamic instability and septic complications.

The stomach occupies the left upper quadrant of the abdomen. Its position can be variable, the non distended one, especially in a supine individual is located largely in the intrathoracic abdomen where though offered some protection by the lower ribs, is at risk of injury in chest trauma. In the erect individual it may extend into the lower abdomen especially when distended with food or liquid [2].

Traumatic gastric injury can occur from either blunt or penetrating abdominal or lower chest injuries. Most diagnosis is at laparotomy as clinical diagnosis is usually peritonitis from hollow viscera injury, and yield from investigation is poor.

The operative repair of gastric injury is relatively straight forward. The key to a successful management is prompt recognition and treatment, to decrease the occurrence of abdominal septic complications, anastomotic breakdown, fistulae and

death.

This study provides insight into the aetiology, operative management and outcome, including mortality of traumatic gastric injury in Jos University Teaching Hospital.

## **Patients, Materials and Method**

This is a prospective analysis of patients treated for traumatic gastric injuries at Jos University Teaching Hospital (JUTH), Jos, Nigeria which is a major trauma referral centre in North Central Nigeria, from November, 2010, to December, 2020. All patients presenting with injuries which alone or in combination require admission were recruited into our Trauma Registry at the point of presentation in the accident and emergency and followed up till discharge or death. Patients with abdominal injuries, alone or in combination with other injuries were resuscitated following Advanced Trauma Life Support (ATLS) protocol, operated upon, and followed up until discharge or death. All the abdominal surgeries were via the open approach, through a midline incision. Repair of the stomach is in two layers using absorbable sutures (polyglactin 910). All patient data were initially collected on a two-page trauma data sheet

Table 1: Age distribution.

Age (years)	Frequency	Percentage
1-9	1	1.8
10-19	8	14.6
20-29	30	54.6
30-39	14	25.5
40-49	2	3.6
<b>Total</b>	<b>55</b>	<b>100</b>

Table 3: A etiology.

	Frequency	Percentage
Gunshot	31	56.4
Stab	18	32.7
RTA	6	10.9
<b>Total</b>	<b>55</b>	<b>100</b>

Table 5: Complications.

Complications	Frequency	Percentage
Non	25	
Surgical site infection	21	
Burst abdomen	1	
Diaphragmatic hernia	1	
Fistula	2	
Empyema	1	
Death	3	
others	2	

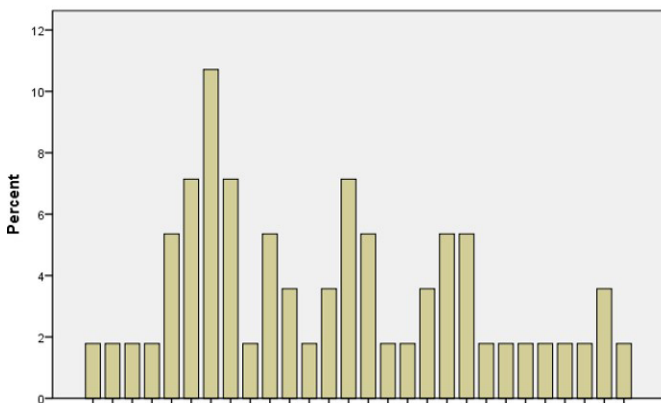


Figure 2: Duration of hospital stay

and updated until discharge or death. Information collected included patient demographics, description of injury and management as well as outcome of care. The data obtained were transferred into Excel spreadsheet and analyzed using SPSS version 23. Results are presented in tables, with frequencies and percentages, means and charts.

**Results**

A total of fifty-five (55) patients presented with traumatic gastric injury, out of 735 abdominal trauma patients admitted through the accident and emergency over the 10-year period. This indicates an average of 5.5 patients per year with traumatic gastric injury. The demographic characteristics of the patients are as shown in tables 1 and 2, and figure 1, with 48(87.3%) being males while 7(12.7%) were females giving a male: female ratio of 6.9:1. Thirty (54.6%) were between the ages of 20-29 years and 14(25.5%) between 30-39 years accounting for the highest proportion. Mechanism of injury was predominately penetrating as shown in table 3, with gunshot injury alone accounting for 31(56.4%), and stab injury 18(32.7%). Two of

Table 2: Sex distribution.

Sex	Frequency	Percentage
Males	48	87.3
Females	7	12.7
<b>Total</b>	<b>55</b>	<b>100</b>

Table 4: Organs injured.

Organ injured	Frequency	Percentage
Stomach alone	18	32.7
Diaphragm	12	21.8
Spleen	5	9.1
Transverse colon	10	18.2
Small intestine	13	23.6
Liver	6	10.9
Others	3	5.5

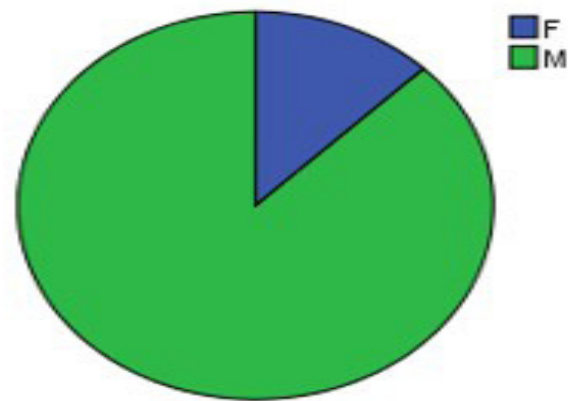


Figure 1: Sex distribution

the 6 road traffic accidents (RTA) were penetrating abdominal injuries. Only 18 patients (37.7%) had injury to the stomach alone, with the remaining 37(67.3%) having injuries to other abdominal viscera, the commonest of which is the small intestine as shown in table 4. The commonest complication is surgical site infection as shown in table 5, and the mortality rate is 5.5. All the mortalities occurred in patients that presented more than 24 hours post trauma. The duration of hospital stay is as shown in figure 2, with a mean of 19.4 days.

**Discussion**

Traumatic gastric injuries are relatively uncommon, occurring in 7-24% of abdominal trauma [3,4]. This is because of the relative mobility of the stomach and gastric mural thickness amongst other factors. In this study we found 55 out of a total of 735 abdominal trauma patients requiring hospital admission over a 10 year period, representing 7.5% of abdominal trauma. This shows an average of 5.5 patients per year, which is lower than 14.1% rate reported from Durban [5], and higher than the 6% from Uzbekistan [6].

The male preponderance of 87.3% is in keeping with the male pattern of predominance in trauma generally and was in line with the findings of other studies [7-9]. There were 44 (80%) patients between the ages of 20 -39 years. This supports the assertion that trauma is a disease of predominantly young adult males [10-12].

Penetrating abdominal injury was the predominant mechanism in this study, as gastric injury following blunt abdominal injury is rare [1, 13]. Gunshot injuries accounted for 56.4% of the patients, which is rather worrying in a civilian population dur-

ing peace time. We opine that this may be due to increasing proliferation of light arms in circulation in our city [14, 15]. However, the finding is in keeping with studies from South Africa and Spain [5, 16].

Isolated gastric injury occurred in 37.7%, the majority having injuries to other abdominal viscera as well. This is not unexpected as the stomach; especially the non distended one enjoys some protection by the lower ribs, and its relatively small size [2].

Complications occurred in 31(56.4%) of the patients, the commonest being wound infection in 21(38.2%). This can be explained by the fact that perforation of the stomach will necessarily cause peritonitis, and the mechanisms of the injuries makes all the wounds untidy by Rank and Wakefield classification, with a high infection rate [17]. Diaphragmatic hernia occurred in one of the 12 patients with associated diaphragmatic injury, which was repaired via the abdominal route. Another patient with diaphragmatic and lung parenchymal injury developed empyema thoraces, and had thoracotomy with decortication of the empyema. Eighteen of those that developed complications presented more than 6 hours post trauma.

The mortality is 5.5%, in keeping with findings from studies in Spain [16]. All mortalities occurred from septic complications. It is worthy to note that all the mortalities were recorded in patients who presented more than 24hours post trauma. Thus, we can infer from this study that delay in presentation is a major predictor of mortality in traumatic gastric injury.

### Conclusion

Traumatic gastric injury commonly involves young adult males, and commonly from penetrating mechanism mainly from firearms. Morbidity and mortality are highly dependent on delayed presentation.

### Conflict of Interest:

None

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