

**Penetrating abdominal injury: our experience in a rural tertiary care centre**Naveen. P<sup>1</sup>, A.Bhaskaran<sup>2</sup>, Pavan.BK<sup>3</sup>,

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Email: [drpnaveenc@gmail.com](mailto:drpnaveenc@gmail.com)**Abstract:**

**Purpose:** To evaluate the causes, pattern and outcome of management of penetrating abdominal trauma. **Methods:** A retrospective analysis of 26 patients with penetrating abdominal injuries was done from 2012-2014. **Results:** The most common age group was 3<sup>rd</sup> decade of life with 10(38.5%) patients, with all 26 patients included in the study being males. Most common cause documented was stab injury (69.2%) followed by accidents (11.5%), suicidal (11.5%) and road traffic accidents (7.7%). Four (15.4%) patients had other associated injuries. Laparotomy was the mode of management in 24(92.3%) cases whereas 2(7.7%) cases were conservatively managed. Jejunum (23.1%) was the most common hollow viscous organ injured and mesenteric injury (42.3%) was the most common solid organ injured. 3(12.5%) patients had negative laparotomy. Two (7.7%) patients were discharged against medical advice. Mortality rate observed was 11.5% with hypovolemia (7.6%) being the most common cause followed by septicemia (3.8%). **Conclusion:** In this study, 23.07 % negative laparotomies associated with its morbidity and mortality determines the fact that laparotomy is not mandatory in all penetrating abdominal injuries, rather careful meticulous examination, selective conservative approach in management and usage of newer diagnostic tools will avoid a negative laparotomy.

**Keywords:** Penetrating abdominal trauma, trauma**Introduction:**

Trauma continues to be the most frequent cause of death in the first four decades of life [1]. Today, trauma is a major public health problem in our country. Abdominal trauma is on a rise as a result of increasing sophistication, vehicular traffic and social violence making it a significant cause of morbidity and mortality [2]. Penetrating injuries have been projected by WHO studies as a determinant for steady increase in deaths by the year 2020 [3]. However little is known about their epidemiological characteristics in our country. There are a large number of patients with penetrating abdominal injuries who have normal vital signs and negative abdominal examinations when referred to trauma centers. A great deal of controversies plague authorities regarding screening of these patients for emergency laparotomy. Although the presence of classic indications such as shock, visceral evisceration and peritoneal irritation suggests laparotomy after abdominal stab wounds, the trend has shifted in the past two decades from mandatory exploration to selective approach [4]. Mandatory

laparotomy used to be carried out by most of the surgeons until Shafston in 1960 introduced the idea of selective conservatism following which the rates of negative laparotomy have progressively decreased [5].

**Materials and Methods:**

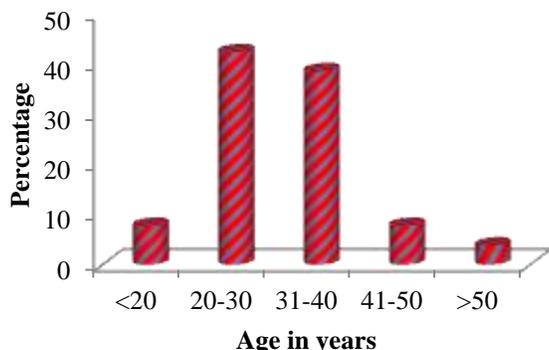
A retrospective clinical study of penetrating abdominal injuries was conducted in RL Jalappa Hospital, Kolar. Patients who presented within a 2-year duration i.e., November 2012 – November 2014 were considered. Patients aged less than 15 years and bull gore injuries were excluded.

All the patients' data were obtained from the inpatient files and from the operation theatre records for analysis. Following parameters were noted on a pre-designed proforma, including bio data of patient, reporting time, mode of injury, laparotomy findings, procedure employed and the post-operative complications and morbidity and mortality.

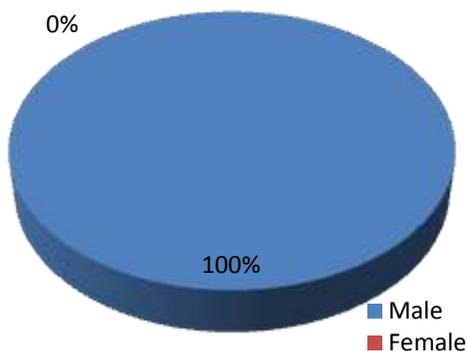
**Results:**

The most common age group was 3rd decade of life with 10(38.5%) patients, with all 26 patients included in the study being males (figure 1 and 2).

**Figure 1: Age distribution**



**Figure 2: Sex distribution**



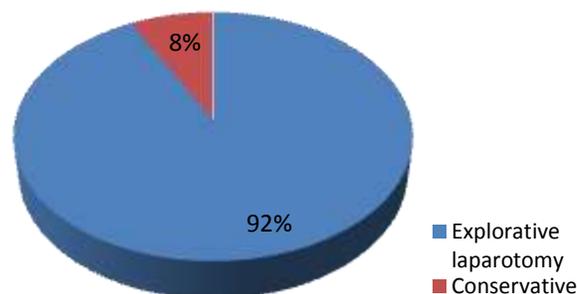
Most common cause documented was stab injury (69.2%) followed by accidents (11.5%), suicidal (11.5%) and road traffic accidents (7.7%) (figure 3).

**Figure 3: Cause of injury**



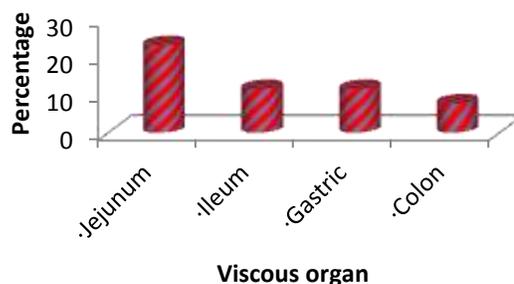
Four (15.4%) patients had other associated injuries. Laparotomy was the mode of management in 24(92.3%) cases whereas 2(7.7%) cases were conservatively managed (figure 4).

**Figure 4: Mode of management**

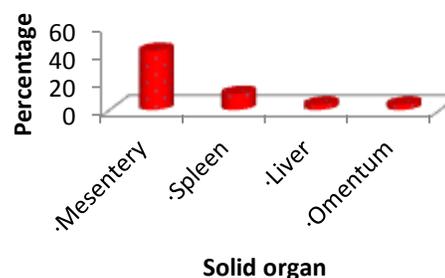


Jejunum (23.1%) was the most common hollow viscous organ injured and mesenteric injury (42.3%) was the most common solid organ injured (figure 5 and 6).

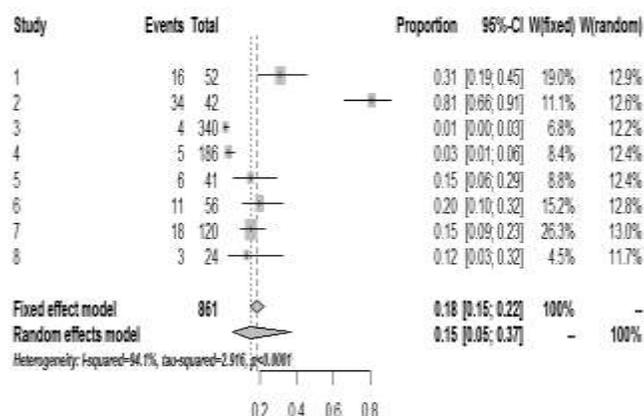
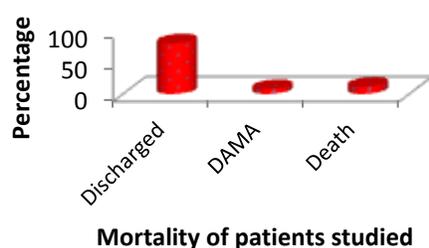
**Figure 5: Viscous organ injury**



**Figure 6: Solid organ injury**



Two (7.7%) patients were discharged against medical advice (figure 7). Mortality rate observed was 11.5% with hypovolemia (7.6%) being the most common cause followed by septicemia (3.8%). 3(12.5%) of patients had negative laparotomy. The meta-analysis results show that 15% had negative laparotomy and is closely related to the present study showing 12.5%.

**Figure 7: Mortality****Discussion:**

Penetrating abdominal trauma management is a topic of constant debate. The approach to a patient with penetrating abdominal trauma depends on various factors like cause of injury, health status of patient and time of presentation to the hospital, associated injuries and resources available at the treating hospital. Though obligatory exploration was the standard mode of management in most cases, the increasing number of negative laparotomies and the associated mortalities have led to the belief that expectant management of selected patients as a prudent alternative. Hence every institution must have an algorithm involving various diagnostic modalities to help chart out the appropriate mode of treatment.

In this retrospective clinical study of penetrating abdominal injuries conducted in RL Jalappa Hospital, Kolar, patients who presented within a 2-year duration i.e., November 2012 – November 2014 were considered. Patients aged less than 15 years and bull gore injuries were excluded. This study aimed at reporting the pattern of penetrating abdominal trauma in a rural tertiary care centre in Kolar, Karnataka, India. All 26 patients included in the study were males. Most common cause documented was stab injury

(69.2%) followed by accidents (11.5%), suicidal (11.5%) and road traffic accidents (7.7%). Four (15.4%) patients had other associated injuries. Circumstances of trauma were communal riots, family disputes and robbery which commonly infested male dominated society of Kolar, thus explaining the involvement of males more than females with penetrating abdominal trauma. The most common age group was 3rd decade of life which constitutes the most lucrative sector of the population and in accordance with the previous studies we believe this might cripple the economic outcome in the future [6].

Laparotomy was the mode of management in 24(92.3%) cases whereas 2(7.7%) cases were conservatively managed. We found that Jejunum (23.1%) was the most common hollow viscous organ injured and mesenteric injury(42.3%) was the most common solid organ injured.

Although liver is the most common solid organ injured in reported series [7,8], it ranked only third in our study.

The traditional approach of compulsory exploration of abdomen in penetrating abdominal trauma has taken a backseat following shafton et al reported in 1960 that a reduction in negative laparotomy rates was possible with selective conservative approach [5]. In our study 3(12.5%) patients had negative laparotomy. The meta-analysis shows the result of our study is closely related to the negative laparotomy percentage (15%) of previous studies [9-13].

In another study by Navasaria and colleague, they assessed 186 patients with abdominal stabs where seventy-four patients (39.8%) underwent emergency laparotomy. There were 5 negative laparotomies (6.8%). The remaining 112 patients (60.2%) were assigned for abdominal observation. One hundred (89.3%) of these patients were successfully managed non-operatively. The remaining 12 patients underwent delayed laparotomy, which was negative in two cases (16.7%). Non-operative management was successful in 53.8% of patients overall. The overall sensitivity and specificity of serial abdominal examination was 87.3% and 93.5%, respectively. They concluded that serial physical examination alone for asymptomatic or mildly symptomatic patients with abdominal stab wounds enables a significant reduction in unnecessary laparotomies [14].

Mortality rate observed in our study was 11.5% with hypovolemia (7.6%) being the most common cause followed by septicemia (3.8%) with two(7.7%) patients were discharged against medical advice.

Any negative laparotomy has a risk of morbidity between 12 and 22% [15-17], including wound infection, respiratory complications, adhesive obstruction and others. Some authors reported a morbidity rate of 6% following negative laparotomy. In this study, the morbidity rate was higher in patients who underwent therapeutic laparotomies for penetrating injuries (11.5%, compared with 0% in patients who underwent non-therapeutic laparotomies).

The low rate of mortality in this study should be interpreted with caution because of the fact that the dominant mechanism of PAT in our country is stab wound while in western countries firearm (gunshot or shotgun) wounds are more prevalent [18].

### Conclusion:

In spite of the introduction of selective conservative management, there was still a high rate of non-therapeutic laparotomies in this study (33.3%) compared with figures from other studies which ranged from zero to 10.5% [7]. This can be explained by the lack of protocols in our emergency departments. However, visceral evisceration remains an indication for exploratory laparotomy, as majority of the patients in our study had organ damage. More importantly it is noteworthy that peritoneal perforation is no longer considered as an indication for mandatory laparotomy and selective conservatism is adopted as a policy in many centers.

### Recommendations:

To conduct road safety awareness campaigns regularly to educate the public.

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