



# The management of penetrating abdominal stab wounds with organ or omentum evisceration: The results of a clinical trial

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## ABSTRACT

**Objective:** The therapeutic approach to abdominal penetrating stab injuries has changed over the years from routine laparotomy to non-operative treatment. In case of organ or omental evisceration, although the laparotomy need is greater, non-operative treatment may be applied in selected cases. The aim of our study was to assess the follow-up and treatment outcomes of patients with organ or omental evisceration due to penetrating abdominal injuries.

**Material and Methods:** Patients with organ or omental evisceration due to penetrating abdominal stab injuries were prospectively evaluated between April 2009 and July 2012. Emergent laparotomy was performed in cases that were hemodynamically unstable or had signs of organ evisceration or peritonitis, while other patients were managed conservatively. Patients' follow-up and treatment outcomes were assessed.

**Results:** A total of 18 patients with organ or omental evisceration were assessed. Six (33.3%) patients underwent emergent laparotomy, and 12 (66.7%) patients underwent conservative follow-up. Three patients in the emergent laparotomy group had signs of organ evisceration, and 3 had signs of peritonitis; five of these 6 patients underwent therapeutic laparotomy and 1 negative laparotomy. In the non-operative follow-up group, therapeutic laparotomy was carried out in a total of 7 patients, 4 being early and 3 late, due to development of peritonitis, whereas 5 (27.8%) patients were managed non-operatively.

**Conclusion:** Although organ or omental eviscerations due to penetrating abdominal stab injuries have a high rate of therapeutic laparotomy, selective conservative therapy is a safe method in selected cases.

**Key Words:** Organ evisceration, omentum evisceration, emergent surgery, non-operative management

## INTRODUCTION

Non-operative treatment has come forth instead of routine laparotomy due to higher rates of unnecessary laparotomy in penetrating abdominal stab injuries (1-5). Non-operative therapy is characterized by watchful waiting in patients with no emergent laparotomy indications. While organ evisceration is an indication for emergency laparotomy, omental evisceration is not an absolute indication, and non-operative therapy may be employed in selected cases (4, 6-9). The aim of our study was to analyze the follow-up and treatment results of patients with penetrating abdominal stab injuries characterized by omental or organ evisceration.

## MATERIAL AND METHODS

This study was done after obtaining approval of the local ethics committee of our hospital. All patients' consent forms were taken. Patients with penetrating abdominal stab injuries with omental or organ evisceration were prospectively evaluated in our general surgery clinic between April 2009 and July 2012.

Hemodynamic instability, peritonitis, and organ evisceration were considered as emergency laparotomy indications, whereas the rest of the patients were approached non-operatively. Hemodynamic instability was diagnosed when systemic blood pressure failed to elevate above 90 mm-Hg despite sufficient resuscitation. Patients were divided into 3 groups in terms of timing of laparotomy. The patients who were immediately operated on simultaneously with resuscitation were considered the emergency laparotomy group, those who were operated on within the first 8 hours were the early laparotomy group, and those who were operated on after 8 hours were considered as the late laparotomy group. The patients were also classified into 3 groups in terms of operative findings. Patients with no intra-abdominal pathology were grouped as negative laparotomy, those with solid organ or serosal injuries with no imminent danger to the patient's life or posing no hemodynamic instability were accepted as non-therapeutic laparotomy, and injuries that threatened life or deranged hemodynamic stability unless surgically managed were grouped into the therapeutic laparotomy group.

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In cases of pure omental evisceration, the omentum was cleaned with sterile isotonic saline solution and then reduced to the abdominal cavity. Thereafter, the fascia and skin incision was closed routinely and followed by non-operative monitoring, except for the emergent laparotomy indications.

Injuries passing beyond the posterior abdominal fascia in the local injury site exploration were accepted as penetrated to the abdomen and followed for 48 hours. Routine follow-up included monitorization of blood pressure, pulse rate, level of consciousness and body temperature, physical examination, hemogram, and upright plain abdominal roentgenogram, chest X-ray, urinalysis, C-reactive protein (CRP), amylase, computerized tomography (CT), ultrasonography, endoscopy, intravenous pyelography, and laparoscopic methods when needed. Physical examination to detect signs of peritonitis and vital signs were repeated every 2 hours for 48 hours, while routine laboratory tests were performed at hours 2, 4, 8, 16, and 24. All patients were administered tetanus vaccine and a single dose of prophylactic antibiotic (ampicillin + sulbactam); no analgesics were given.

In this study, age, gender, site of intra-abdominal injury, laparotomy modes, and mortality and morbidity data were assessed.

#### Statistical Analysis

Normally distributed continuous variables were expressed as mean±standard deviation; categorical variables were expressed as frequencies and percentages.

#### RESULTS

Eighteen patients with penetrating abdominal stab injuries with organ or omental evisceration were included. All patients were male, and mean age was 26.3 (15-46) years. Two patients had organ, 15 had omental, and 1 had both organ and omental evisceration.

After the first assessment, 6 patients underwent emergency laparotomy. Laparotomy indications were hemodynamic instability in 1 patient, signs of peritonitis in 2, and organ evisceration in 3. The patient with hemodynamic instability had a fifth-grade liver laceration, and he died preoperatively. One of 2 patients who underwent emergency laparotomy due to peritonitis had a stomach injury, and the other had small intestinal and colonic injuries. Organ evisceration involved the small intestine in 2 patients and stomach in 1. No pathology was detected in the patient with gastric evisceration, whereas 2 patients who had small intestinal evisceration had a small intestinal injury.

Seven out of 12 patients who were excluded from emergency laparotomy and managed non-operatively developed signs of peritonitis during follow-up, and 4 underwent early and 3 underwent late laparotomy. Two of those who underwent early laparotomy had small intestinal, 1 had colonic, and 1 had small intestinal and gastric injuries. Two of 3 patients who under-

went late laparotomy had small intestinal and 1 had colonic and hepatic injuries (Table 1).

The remaining 5 patients did not develop any complications and were discharged after completion of non-operative therapy. In 3 years of follow-up, hernia from the stab wound has not occurred in any patient.

#### DISCUSSION

Penetrating abdominal stab injuries commonly encountered in emergency services were managed via routine laparotomy. Being performed with concern for the intra-abdominal organ injury, this practice has been associated with higher unnecessary laparotomy rates and increased morbidity and mortality (2, 4, 5, 10). Following questioning of routine laparotomy by Shaftan in 1960, this approach has been gradually discontinued, and the non-operative approach has come forth (11). Most surgical centers currently employ non-operative therapy instead of routine laparotomy.

There is consensus regarding emergency laparotomy in hemodynamically unstable patients with signs of peritonitis and organ evisceration. It has been recommended that the remaining patients be treated with a non-operative approach (1-5, 12). In non-operative therapy, a wait-and-see policy is applied, and follow-up results dictate the therapy. Unnecessary laparotomy rate, which climbs up to 40% with routine laparotomy, may drop down to 0% with regard to non-operative therapy (2, 5). A previous study of our group found a rate of 57% for unnecessary laparotomy in routine laparotomy versus 20% in non-operative therapy (13, 14).

Patients are followed by physical examination in non-operative therapy. Even physical examination alone can differentiate if a patient requires emergency laparotomy in 90% of cases. Many studies have reported a sensitivity of 97.4% for physical examination (1, 2, 5, 9). Adding fairly advanced imaging modalities to the physical examination in certain states enables a safer application of non-operative therapy.

Organ evisceration is mostly accepted as an indication for emergency laparotomy. The need for surgical intervention reaches a rate of 70%-80% in cases with penetrating abdominal stab injuries with organ evisceration (2, 4, 15-19). While 2 out of 3 patients with organ evisceration requiring surgical intervention had an intra-abdominal injury, 1 had no such injury. Omental evisceration, on the other hand, is not an indication for routine laparotomy (4, 6-9, 15). The omentum may be irrigated, cleaned, and reduced to the abdominal cavity. Risk of intra-abdominal injury is higher in such patients compared to those with no evisceration. Therefore, one must be more careful in this condition. In our previous study, laparotomy was therapeutic in 9 of 12 (75%) when performed for a penetrating abdominal stab injury without evisceration, while laparotomy was therapeutic in 12 out of 13 patients (92%) undergoing laparotomy for evisceration (14).

Table 1. Patients operated on due to evisceration

Age	Operation time	Operation indication	Injured organ	Laparotomy	Evisceration	PATI
39	3. hour	Peritonitis	Small intestine	Therapeutic	Omentum	4
16	4. hour	Peritonitis	Large intestine	Therapeutic	Omentum	8
37	24. hour	Peritonitis	Small intestine	Therapeutic	Omentum	4
17	Urgent	Organ evisceration	No injury	Negative	Stomach, omentum	0
27	3. hour	Peritonitis	Small intestine, stomach	Therapeutic	Omentum	12
28	3. hour	Peritonitis	Small intestine	Therapeutic	Omentum	8
23	Urgent	Peritonitis	Stomach	Therapeutic	Omentum	4
25	Urgent	Hemodynamic instability	Liver	Therapeutic	Omentum	12
22	40. hour	Peritonitis	Small intestine	Therapeutic	Omentum	4
33	72. hour	Peritonitis	Large intestine, liver	Therapeutic	Omentum	12
19	Urgent	Organ evisceration	Small intestine	Therapeutic	Small intestine	4
28	Urgent	Peritonitis	Small intestine, large intestine	Therapeutic	Omentum	16
22	Urgent	Organ evisceration	Small intestine	Therapeutic	Small intestine	4

PATI: penetrating abdominal trauma index

In a study by Arikan et al. (8), 7 of 31 patients who were followed non-operatively for organ and omentum evisceration underwent laparotomy, which was regarded as unnecessary in 2 patients.

Again, in another study, a routine laparotomy was performed in 35 patients with organ evisceration, with 2 unnecessary laparotomy procedures. Six of 31 patients with omental evisceration were followed non-operatively in the same study (15).

## CONCLUSION

Non-operative therapy can be safely applied in selected patients with penetrating abdominal stab injuries with organ or omental evisceration, although the need for surgical intervention is higher in these patients compared to those without evisceration.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Ümraniye Training and Research Hospital.

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

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