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# Original Research

## Evaluation of patients of traumatic diaphragmatic hernia

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***ABSTRACT:***

**Background:** The muscle that divides the chest cavity from the abdominal cavity, the diaphragm, can sustain a catastrophic injury that results in a traumatic diaphragmatic hernia (TDH). The present study was conducted to evaluate cases of traumatic diaphragmatic hernia. **Materials & Methods:** 80 cases of traumatic diaphragmatic hernia of both genders were selected. The severity of injuries to various body areas was evaluated using the abridged injury scale (AIS), from which the injury severity score (ISS) was derived. Various parameters were documented, including the length of hospital stay (LOS), surgical technique, side effects, source of trauma, and intestinal hematoma. **Results:** Out In acute and chronic form, sideinvolved was left in 28 and 18 and right in 14 and 20. Admission was emergency in 30and 22 and outpatient in 12 and 16 respectively. Mechanism of trauma was blunt in 22 and 20 and penetratingin 20 and 18. Intestines hernia was present in 10 and 24 and absent in 32 and 14 respectively. Surgical approacheswas thoraco-abdominal in 9 and 10, thoracotomy in 21 and 17 and laparotomy in 12 and 11 respectively. The difference was significant (P< 0.05). The mean LOS (days) was 40.1 and 23.7, length of the rupture was 10.2 cm and 5.2 cm and ISS was 24.5 and 11.6 in acute and chronic respectively. The difference was significant (P< 0.05). **Conclusion:** Milder traumas are more likely to result in persistent TDH. Patients with paraphrenic injuries need to get a thoraco-abdominal computed tomography scan in order to avoid a delayed diagnosis of TDH.

**Key words:** thoraco-abdominal, penetrating, traumatic diaphragmatic hernia

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## INTRODUCTION

The muscle that divides the chest cavity from the abdominal cavity, the diaphragm, can sustain a catastrophic injury that results in a traumatic diaphragmatic hernia (TDH).[1] The diaphragm is defective or torn in this disorder, which causes the abdominal organs to herniate or protrude into the chest cavity.[2] Traumatic diaphragmatic hernia (THH) can be caused by a variety of trauma types, including blunt trauma, which is the most frequent cause of TDH and can be brought on by car crashes, falls from great heights, or direct blows to the abdomen or chest. Stabbing or gunshot wounds to the abdomen or chest are examples of penetrating trauma that can cause a diaphragmatic injury and subsequent herniation.[3,4]

In a traumatic event, such as an accident or injury, a quick increase in intra-abdominal pressure can cause damage to the diaphragm.[5] Abdominal organs like the stomach, small intestine, or spleen can pass through an aperture made when the diaphragm is ripped or weak. Due to the displaced organs' potential to pressure the heart, lungs, or other surrounding structures, this herniation can cause catastrophic consequences.[6] Traumatic diaphragmatic hernia symptoms could be concealed by more serious wounds received during the traumatic incident, making them less obvious at first.[7] Breathing problems, chest pain or discomfort, abdominal pain or soreness, bowel blockage, or gastrointestinal symptoms (if organs are caught in the hernia) are some typical indications and symptoms, though.[8]The present study was conducted to evaluate cases of traumatic diaphragmatic hernia.

## MATERIALS & METHODS

The present study consisted of 80 cases of traumatic diaphragmatic hernia of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. The severity of injuries to various body areas was evaluated using the abridged injury scale (AIS), from which the injury severity score (ISS) was derived.

Various parameters were documented, including the length of hospital stay (LOS), surgical technique, side effects, source of trauma, and intestinal hematoma. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## RESULTS

**Table I Distribution of patients**

| Total- 80 | | |
|---|---|---|
| **Gender** | **Male** | **Female** |
| Number | 42 | 38 |

Table I shows that out of 80 patients, males were 42 and females were 38.

**Table II Assessment of parameters**

| Parameters | variables | Acute | Chronic | P value |
|---|---|---|---|---|
| Side | Left | 28 | 18 | 0.68 |
| | Right | 14 | 20 | |
| Admission | Emergency | 30 | 22 | 0.05 |
| | Outpatient | 12 | 16 | |
| Mechanism of trauma | Blunt | 22 | 20 | 0.03 |
| | Penetrating | 20 | 18 | |
| Intestines hernia | Present | 10 | 24 | 0.04 |
| | Absent | 32 | 14 | |
| Surgical approaches | Thoraco-abdominal | 9 | 10 | 0.05 |
| | Thoracotomy | 21 | 17 | |
| | Laparotomy | 12 | 11 | |

Table II, graph I shows that in acute and chronic form, side involved was left in 28 and 18 and right in 14 and 20. Admission was emergency in 30 and 22 and outpatient in 12 and 16 respectively. Mechanism of trauma was blunt in 22 and 20 and penetrating in 20 and 18. Intestines hernia was present in 10 and 24 and absentin 32 and 14 respectively. Surgical approacheswas thoraco-abdominal in 9 and 10, thoracotomy in 21 and 17 and laparotomy in 12 and 11 respectively. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**

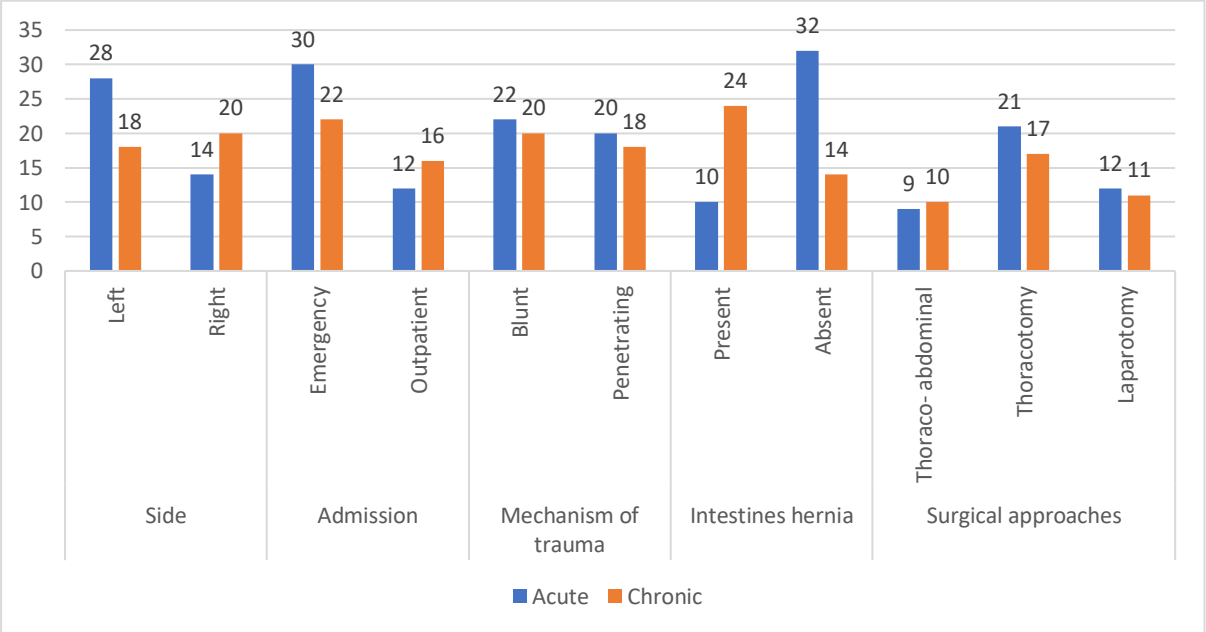


**Table III Assessment of outcome**

| Variables | Acute | Chronic | P value |
|---|---|---|---|
| LOS (days) | 40.1 | 23.7 | 0.01 |
| Length of the rupture (cm) | 10.2 | 5.2 | 0.05 |
| ISS | 24.5 | 11.6 | 0.03 |

Table III shows that mean LOS (days) was 40.1 and 23.7, length of the rupture was 10.2cm and 5.2cm and ISS was 24.5 and 11.6 in acute and chronic respectively. The difference was significant (P< 0.05).

## DISCUSSION

TDH diagnosis can be difficult since it can not show up in early trauma evaluations. It may remain undetected and untreated for a long time, delaying the start of treatment.[9,10] Imaging tests that can identify the diaphragmatic defect and the herniated organs include chest X-rays, CT scans, and ultrasounds. The standard course of treatment for traumatic diaphragmatic hernias is surgical correction.[11] The purpose of surgery is to repair the diaphragm's tear and return the herniated organs to the abdominal cavity. In certain instances, a minimally invasive surgical technique might be necessary, but in more complicated circumstances, more involved procedures might be needed.[12] The present study was conducted to evaluate cases of traumatic diaphragmatic hernia.

We found that out of 80 patients, males were 42 and females were 38.Thirteen patients with a diaphragmatic hernia or traumatic diaphragmatic rupture were treated by Filiz et al.[13] The mean age of all patients, who were male, was 23.1 years. In every case, the diaphragmatic rupture was on the left side. Of these patients, seven had penetrating trauma and six had blunt trauma. Four patients had their diaphragmatic rupture diagnosis made in less than twenty-four hours. The interval between the diagnosis and the development of intra-throracic herniation of abdominal organs in the remaining 9 individuals was 12 to 48 months. Transverse colon herniation was the most common organ herniation. The defect was closed using non-absorbable sutures. There were 30% of complications, but no deaths were reported. Following upper abdominal and distal chest blunt or penetrating injuries, a strong index of suspicion is crucial.

We found that in acute and chronic form, sideinvolved was left in 28 and 18 and right in 14 and 20. Admission was emergency in 30and 22 and outpatient in 12 and 16 respectively. Mechanism of trauma was blunt in 22 and 20 and penetratingin 20 and 18. Intestines hernia was present in 10 and 24 and absent in 32 and 14 respectively. Surgical approacheswas thoraco-abdominal in 9 and 10, thoracotomy in 21 and 17 and laparotomy in 12 and 11 respectively. Fifty acute and nineteen chronic TDH patients were diagnosed in a study by Gu P et al.[14] Compared to acute TDH patients, chronic TDH patients exhibited a substantially lower Injury Severity Score ($10.26 \pm 2.68$ vs. $26.92 \pm 4.79$, $P < 0.001$). Thoracotomy and laparotomy were the most often used surgical techniques for treating acute and chronic TDH, respectively. Diaphragmatic rupture length was shown to be substantially shorter in individuals with chronic TDH compared to those with acute TDH ($6.00 \pm 1.94$ cm vs. $10.71 \pm 3.30$ cm, $P < 0.001$). Compared to chronic TDH patients, acute TDH patients had a considerably longer mean length of hospital stay ($41.18 \pm 31.02$ days vs. $16.65 \pm 9.61$ days, $P = 0.002$). We found that mean LOS (days) was 40.1 and 23.7, length of the rupture was 10.2 cm and 5.2 cm and ISS was 24.5 and 11.6 in acute and chronic respectively. In the study by Peer et al.[15] (2014), 29 patients with traumatic diaphragmatic hernias had surgery. For 24 patients (83%) and 5 patients (17%), blunt trauma and penetrating trauma were the causes of rupture, respectively. In 21 patients (72%) the diagnosis was made in less than 24 hours, while in 8 patients (28%) it took longer. For 20 patients (69%) the most prevalent surgical technique was a thoracotomy. Mortality was 13.8% and post-operative morbidity was 24%. Diaphragmatic rupture diagnosis was greatly aided by chest X-rays. Diagnosing ruptures on the right side is challenging. When there are no concurrent intra-abdominal injuries, diaphragmatic hernia repair can be performed with a thoracotomy with satisfactory outcomes for the patient.

The limitation the study is small sample size.

## CONCLUSION

Authors found that milder traumas are more likely to result in persistent TDH. Patients with paraphrenic injuries need to get a thoraco-abdominal computed tomography scan in order to avoid a delayed diagnosis of TDH.

## REFERENCES


1. Wirbel RJ, Mutschler W. Blunt rupture of the right hemidiaphragm with complete dislocation of the right hepatic lobe: report of a case. Surg Today 1998; 28: 850-852.
2. Grillo IA, Jastaniah SA, Bayoumi AH, et al. Traumatic diaphragmatic hernia: an Asir region (Saudi Arabia) experience. Indian J Chest Dis Allied Sci 2000; 42: 9-14.
3. Friese RS, Coln CE, Gentilello LM. Laparoscopy is sufficient to exclude occult diaphragm injury after penetrating abdominal trauma. J Trauma 2005; 58: 789-792.
4. Cherry RA, Eachempati SR, Hydo LJ, et al. The role of laparoscopy in penetrating abdominal stab wounds. SurgLaparoscEndoscPercutan Tech 2005; 15: 14-17.
5. Matthews BD, Bui H, Harold KL, et al. Laparoscopic repair of traumatic diaphragmatic injuries. SurgEndosc 2003; 17: 254-258.
6. Baca B, Karahasanoğlu T, Sarıbeyoğlu K, et al. Late complication of diaphragmatic gunshot injury: appendix perforation due to colon incarceration. Ulus Travma Acil CerrahiDerg 2007; 13: 70-73.
7. Ramos CT, Koplewitz BZ, Babyn PS, et al. What have we learned about traumatic diaphragmatic hernias in children? J PediatrSurg 2000; 35: 601- 604.
8. Murray JA, Demetriades D, Asensio JA, et al. Occult injuries to the diaphragm: prospective evaluation of laparoscopy in penetrating injuries to the left lower chest. J Am Coll Surg 1998; 187: 626-630.
9. Miller L, Bennett EV Jr, Root HD, et al. Management of penetrating and blunt diaphragmatic injury. J Trauma. 1984; 24: 403-409.
10. Matsevych OY. Blunt diaphragmatic rupture: four year's experience. Hernia 2008; 12: 73-78.
11. Murray JG, Caoili E, Gruden JF, et al. Acute rupture of the diaphragm due to blunt trauma: diagnostic sensitivity and specificity of CT. AJR 1996; 166: 1035-1039.

12. Guth AA, Pachter HL, Kim U. Pitfalls in the diagnosis of blunt diaphragmatic injury. Am J Surg 1995; 170: 5-9.
13. Filiza AI, Kurta Y, Sucullua I, Yucela E, Akına ML. Traumatic diaphragm rupture: an experience of 13 cases. Eastern J Med. 2008;13:25-9.
14. Gu P, Lu Y, Li X, Lin X. Acute and chronic traumatic diaphragmatic hernia: 10 years' experience. PLoS One 2019;14(12): 0226364.
15. Peer SM, Devaraddeppa PM, Buggi S. Traumatic diaphragmatic hernia-our experience. International Journal of Surgery. 2009 Jan 1;7(6):547-9.