

# Gastric Rupture At The Fundus- A Rare Presentation After Blunt Trauma Of The Abdomen

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## Abstract

Vehicular accidents are quite common these days and fast emerging as one of the leading causes of death. Among injuries sustained in blunt trauma, gastric rupture is quite uncommon especially at the fundus. We present a rare case of gastric rupture at fundus after blunt trauma of abdomen. This condition may present with minimal clinical or radiological signs early in its course. A knowledge and high index of suspicion is essential to diagnose this condition early, which otherwise would lead to higher morbidity and mortality.

## INTRODUCTION

Gastric rupture is a rare entity following blunt trauma to the abdomen. Vehicular trauma is the cause in 70% of patients, while the rest of the cases is due to direct violence, cardio pulmonary resuscitation, and falls. In left sided trauma, the full stomach is unprotected and more vulnerable to injury. Liver uniformly absorbs impact of trauma on right side. The anterior wall of the stomach is most common site of rupture followed by greater curvature, lesser curvature and posterior wall in order of decreasing frequency. We report a case of gastric rupture at fundus after blunt trauma abdomen which is quite unusual.

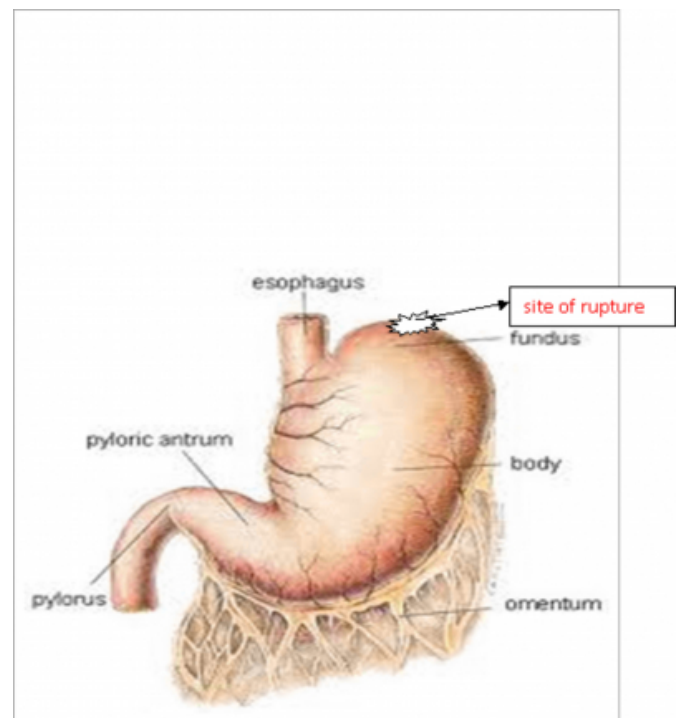
## CASE SUMMARY

A 20 year old male was admitted in casualty with a history of automobile accidents. He was having degloving injury of bilateral gluteal region and lower limbs. After adequate resuscitation he was investigated. He was found to have fracture of pelvis and right fibula after clinicoradiological evaluation. The patient was shifted to operation theatre where debridement for degloving injury was done. During postoperative period in ward he developed features of peritonitis after 2 days. He was explored and a perforation of 4x4 cms size at summit of fundus of stomach and two litres of seropurulent fluid in peritoneal cavity were found (figure 1-intraoperative photograph could not be taken due to emergency situation, we have given diagram showing site of rupture). The rest of the abdomen was normal. The fundic perforation was closed in two layers after freshening the edges and abdomen was closed after thorough peritoneal

lavage. Despite intensive care, the patient expired on the 3<sup>rd</sup> post operative day due to septicemia.

## Figure 1

Figure 1-Arrow in diagram showing site of perforation.



## DISCUSSION

Blunt gastric rupture is an uncommon entity, occurring with an incidence of 0.02% to 1.7% in blunt abdominal trauma.<sup>1,2,3</sup> Concomitant intra-abdominal injuries contribute to a significant morbidity and mortality. Prompt and accurate

diagnosis is essential to early treatment.

Motor vehicle collisions are the most common cause of gastric rupture in blunt trauma, accounting for approximately 75% of cases.<sup>1,2</sup> Other mechanisms include automobile vs. pedestrian, falls, assaults, and cardiopulmonary resuscitation.<sup>3</sup> A history of consuming a recent meal is common with this injury, as a distended stomach is less pliable and more likely to rupture from blunt force.<sup>1,2</sup>

The majority of patients with gastric rupture will present with signs of shock or abdominal tenderness. However, in this case, signs and symptoms of an acute abdomen appeared late. Preoperative diagnosis may be difficult, because no physical signs are specific for gastric rupture. Although upright chest X-rays can diagnose free intraperitoneal air, chest X-ray fails to identify pneumoperitoneum in a substantial amount of patients with gastric rupture because most trauma chest films are done supine.<sup>1,4</sup> Even so, only 50% to 66% of the gastric rupture cases develop enough free air to be detected by upright chest X-ray.<sup>1,4</sup> Diagnostic peritoneal lavage can aid in the diagnosis when blood, food particles, or turbid or bilious fluid is aspirated.<sup>3</sup> In the hemodynamically stable patient, the diagnostic study of choice is CT scan. CT scan can lead to early diagnosis of gastric rupture, and is accurate in detecting associated bowel, vascular, or solid organ injury prior to surgery.<sup>2</sup>

Most series report that the anterior wall of the stomach is the most common site of rupture, followed by the greater curvature, the lesser curvature, and the posterior wall.<sup>1</sup> In our patient, the rupture was found at fundus of stomach which is very rare.

The distribution of rupture along anterior wall, greater and lesser curvatures has been related to:-

Laplace's law which states that wall tension of a cylindrical object is directly proportional to the product of intraluminal pressure and radius of curvature. Therefore at a given gastric pressure during impact wall tension is highest in the part of stomach which is of greatest curvature predisposing them to rupture<sup>5</sup>.

High incidence of rupture of the anterior wall and greater curvature is due to a shearing force that is generated by a combination of rapid forward motion of these areas during deceleration, the relatively fixed nature of the lesser curvature and the momentum of large volume of the gastric

contents<sup>5</sup>.

'Stomach jolt':- due to rapid deceleration of full stomach is another mechanism of stomach injury particularly if associated with splenic injury<sup>6</sup>.

Adequate debridement is necessary prior to repair. Repair of the stomach with a 2-layer closure is the treatment of choice for blunt gastric rupture.<sup>2</sup> Many blunt injuries may require resection after debridement. Nasogastric drainage and thorough peritoneal lavage with saline are necessary after the injury is repaired.

Most complications are a result of the massive intraperitoneal contamination that ensues after rupture of a distended stomach and usually account for the late mortality.<sup>1,2</sup> The most common complications are intra-abdominal abscess, gastric fistula formation, and wound infection.<sup>1,2,4</sup> The mortality rate associated with gastric rupture is <66%.<sup>1,4</sup> The high morbidity and mortality associated with this injury are related to the number of associated injuries, delay in diagnosis, and development of complications.<sup>4</sup> Having a high index of suspicion, making an early diagnosis, performing adequate debridement and repair, and aggressively treating any complications are keys to survival in patients that have sustained a gastric rupture from blunt abdominal trauma.

### **CONCLUSION**

We report a case of gastric perforation at fundus following blunt abdominal trauma with delayed presentation of sign and symptoms of acute abdomen. Although rare, gastric rupture is associated with a high morbidity and mortality. Early diagnosis and aggressive treatment with debridement, primary repair, and peritoneal lavage can help decrease intraperitoneal contamination. These elements are essential for successful outcomes in these patients.

### **References**

1. Brunsting LA, Morton JH. Gastric rupture from blunt abdominal trauma. *J Trauma*. 1987;27:887-891.
2. Ishikawa K, Ueda Y, Sonoda K, Yamamoto A, Hisadome T. Multiple gastric ruptures caused by blunt abdominal trauma: Report of a case. *Surg Today*. 2002;32:1000-1003.
3. Bruscajin V, Coimbra R, Rasslan S, et al. Blunt gastric injury. A multicentre experience. *Injury*. 2001;32:761-754.
4. Courcy PA, Soderstrom C, Brotman S. Gastric rupture from blunt trauma. A plea for minimal diagnostics and early surgery. *Am Surg*. 1984;50:424-427.
5. Siemens RA, Fulton RL. Gastric rupture as a result of blunt trauma. *Am Surgeon* 1977; 43:229-233.
6. Garg P, Chitkara N, Dass B. Stomach jolt – a possible mechanism for Gastrosplenic injury in blunt abdomen trauma. *Ind J Gastroentrol* 1996; 15(4):153.

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