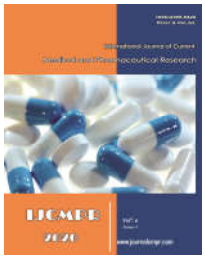
Research Article

INTERNATIONAL JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH

ISSN: 2395-6429, Impact Factor: 4.656
Available Online at www.journalcmpr.com
Volume 6; Issue 01(A); January 2020; Page No. 4891-4894
DOI: http://dx.doi.org/10.24327/23956429.ijcmpr202001826



A POST TRAUMATIC GASTRIC BIG BANG

Cheikh Malaaynine M.F., Rabbani K., Lammat H., Louzi A and Finech B

Department of General Surgery, University Hospital Center Mohamed VI,

ARTICLE INFO

Article History:
Received 14th October, 2019
Received in revised form 29th November, 2019
Accepted 05th December, 2019
Published online 28th January, 2020

Key words:
blunt abdominal trauma, peritonitis by gastric perforation

ABSTRACT

Gastric perforations following blunt abdominal trauma are rare, accounting for <2% of all blunt abdominal injuries. Isolated blunt gastric ruptures are uncommon. They are usually associated with other solid visceral injuries. Injuries to the stomach are associated with the highest mortality of all hollow viscus injuries. Severity of the injury, timing of presentation and presentation following the last meal as well as concomitant injuries are important prognostic factors. Imaging modalities may be unreliable in making a diagnosis and thus clinical vigilance is mandatory. We present a patient 16 years old with a meny gastric perforation following blunt abdominal trauma and review the literature

INTRODUCTION

Blunt abdominal trauma (BAT) following assaults, motor vehicle accidents and falls not uncommonly results in solid organ (liver, spleen and kidney), diaphragmatic, pancreatic and retroperitoneal injury. Hollow viscera injuries to duodenum, jejunum, urinary bladder and the colo-rectum are also not uncommon with an incidence that varies between 4 to 15% [1,2,14]. However, by contrast, gastric perforations following BAT have an incidence of between 0.02 to 1.7% [1].

The rarity of gastric perforation developing following BAT in civilian practice together with the inconsistent diagnostic yield from standard investigations has led to this condition being invariably recognized at laparotomy. In this case report we describe a gastric rupture after a bicycle accident preceded by a heavy meal in the beautiful region of Ourika Marrakech.

Case Presentation

A 16 years old male patient presented with severe abdominal pain and distention as a result of a blunt abdominal trauma following a BYCYCLE accident 3 h previously (violent fall on the bike handlebars stumbled directly on his epigastrium). At the admission, the patient was fully conscious, in state of shock, blood pressure at 87mm/55 with a pulse rate of 122/min. The hemoglobin was 9.6 g/dL, lipasemia was 75 UI/L. A bruise and an abrasion were evident over epigastrium. The abdomen was distended and peritonitic. respiratory functions were normal. An abdominal X-Ray revealed a pneumoperitoneum.

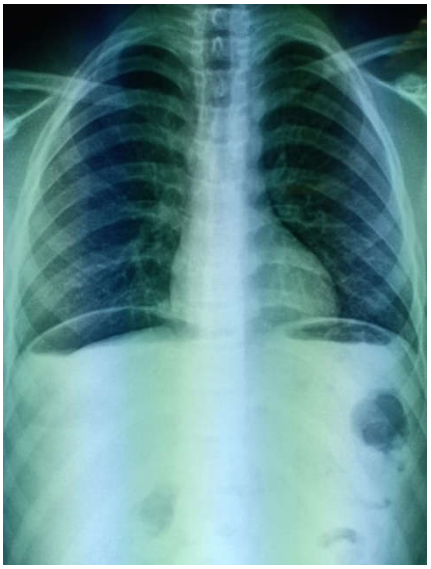


Fig 1 pneumoperitoneum under the domes diaphragmatic region

The patient is sent directly to the operating room with conditioning for stabilization of its hemodynamic double venous filling and intraoperative transfusion, surgical exploration by median laparotomy found a high-volume hemoperitoneum with the presence of multiple food debris not digested with the presence of a gastric rupture with a perforation of 5 cm on the large tuberosity, one of 4 cm opposite the right sub-cardial region with a transfixing lesion dividing the pyloric antrum in two. This was classified as a Grade III gastric injury (table 1).

Corresponding author:* **Cheikh Malaaynine M.F
Department of General Surgery, University Hospital Center Mohamed VI,

Table 1 Grading of gastric injuries .[1]

Grading of gastric injuries		
Grade I	Intramural hematoma < 3cm Partial thickness laceration	
Grade II	Laceration	<2cm in GE junction/pylorus <5cm in proximal one-third <10cm in distal two-third
Grade III	Laceration	>2cm in GE junction/pylorus ≥5cm in proximal one-third ≥10cm in distal two-third
Grade IV	Vascular :	Tissue loss/devascularisation ≤ two-third stomach
Grade V	Vascular :	Tissue loss/devascularisation ≥ two-third stomach

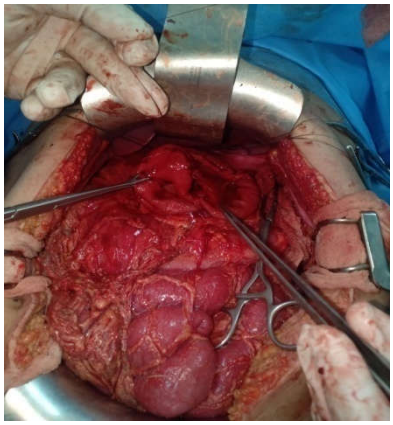


Fig 2 shearing of the antro-pyloric region

Fig 3 lesion of the gastric tuberosity measuring 5cm

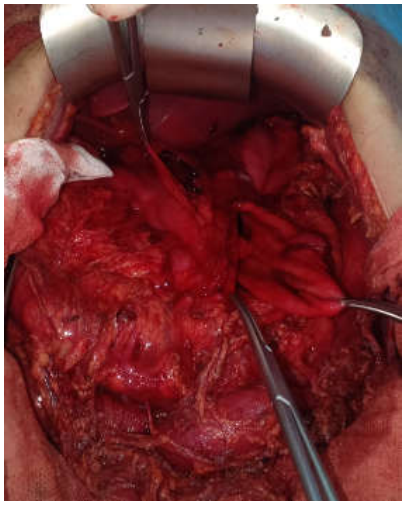


Fig 4 lesion of the small epiploon and sub-cardial region

After a brave decision, stitching of the various perforation by overlock with vicryl 3/0 were chosen. with placement of a feeding jejunostomy tube.

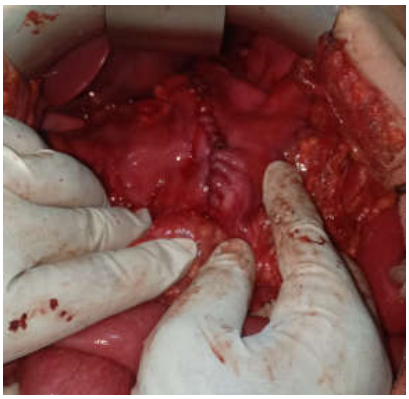


Fig 5 overlocking the anterior and posterior gastric sides by vicryl 3/0

Fig 6 stitching of other lesions

The patient spent 48 hours in intensive care unit. The post-surgical evolution was satisfying. methylene blue test was negative at the day 6,and a control scan on day 9 following the surgery showed an intact gastric wall without extravasation of gastrografin that has progressed to the jejunal loops, with no collection or effusion. Oral feeding was allowed at day 10 of the post-operative period and the jejunostomy tube was removed at day 20.

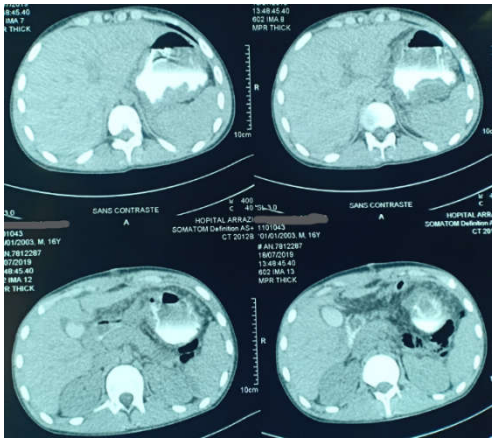


Fig 7 CT control :Intact gastric wall, there is no extravasation of gastrografin.

DISCUSSION

The infrequency of gastric perforation following BAT is due to several factors that include the protective anatomy afforded by the thoracic cage, the relative mobility of the stomach and gastric mural thickness [5]. Classically, gastric perforations due to BAT have been attributed to 3 mechanisms:

External compression resulting in an acute and intense rise of intra-abdominal pressure. This mechanism applies in a particular to a distended stomach with a consequent massive increase of intra gastric pressure. This mechanism may explain

the development of gastric perforation following the Heimlich maneuver.

Rapid deceleration causes differential movement among adjacent structures resulting in shear forces causing hollow, solid, visceral organs and vascular pedicles to tear, especially at relatively fixed points of attachment.

Crushed intra-abdominal contents between the anterior abdominal wall and the vertebral column or posterior thoracic cage.

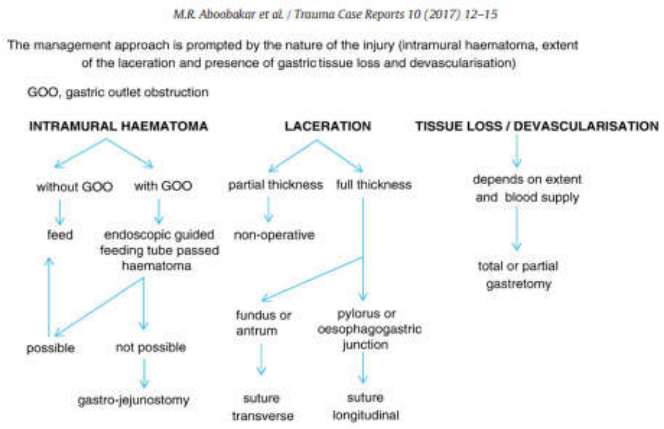
Gastric perforations due to BAT may develop in any location of the stomach. The most common location for gastric perforation is the anterior wall (40%) followed by the greater curvature (23%), lesser curvature (15%) and posterior wall (15%). Such perforations are invariably solitary; to date only 3 cases of a double gastric perforation following BAT have been described (Table2) [6]. Gastric perforations following BAT are usually associated with other intra- and extra-abdominal injuries; isolated blunt gastric ruptures are uncommon. The most common associated injury is to the spleen, followed by thoracic injury [5,6]. The successful management of gastric perforations due to BAT is contingent on an accurate clinical evaluation. Injuries to the stomach are associated with the highest mortality of all hollow viscus injuries [7]. Morbidity and mortality increases parallel with time to operative intervention (intervention within 8 h is associated with a 2% mortality, intervention within 8 to 16 h with a 9% mortality, intervention within 16 to 25 h, a 17% mortality and intervention after 24 h over 30% mortality) [6]. The overall reported mortality ranges from 0–66% [5,6,8]. The majority of complications are septic in nature with the reported incidence of intra-abdominal abscesses being up to 24% [9]. In contrast to the fasted patient with a low gastric pH and bacterial load, the fed patient has a higher gastric pH that predisposes to a greater bacterial load with potential to predispose to much contamination and infective complications. In the instance of unequivocal peritonitis prompt laparotomy will afford early diagnosis and appropriate treatment. However, the physical examination may be misleading when the patient is intoxicated or has associated injuries (head injury, spinal cord injury, thoracic or long bone trauma) [10]. Although shock on presentation has been reported as a fairly common occurrence, it was reported in b20% of cases [3]. Vassey et al. have suggested that aspiration of dark coloured fluid on peritoneal lavage or paracentesis is probably the best pre-operative diagnosis of gastric perforation [11]. Serum amylase has been suggested as a biochemical marker to diagnose upper gastrointestinal rupture [12]; the unpredictability of this test makes this an unreliable diagnostic marker.

Table 2 Summary of the features of gastric injury due to blunt trauma.[1]

Mechanisms of injury	Increase in intra gastric pressure Deceleration shear force tears Crush between anterior abdominal wall and vertebra
Location of injury	Anterior wall 40% Greater curve 23% Lesser curve 15% Posterior wall 15%
Most common associated injury	Spleen
Mortality	Increases with time to operative intervention
Complications	Abdominal abscess (24%) [more common in post-prandial trauma]
Diagnosis	Abdominal radiograph: pneumoperitoneum Peritoneal paracentesis: dark colored fluid Computed tomography: free fluid with thickened wall and mesenteric fat standing
Management	According to grade (Table 1)

Plain abdominal radiographs may show pneumoperitoneum, retroperitoneal air or the obliteration of psoas muscle shadow, which though non-specific, will prompt surgical intervention. When there is a diagnostic dilemma, recourse to ultrasonography and computed tomography is advised. Ultrasonography has value in identifying intra-abdominal fluid which, in the presence of hemodynamic instability, strongly suggests free blood and an indication for laparotomy. The failure to reliably distinguish hollow visceral injury from solid visceral injury is vital and compromises the decision to undertake laparotomy, particularly in hemodynamic patients. Presently, helical (spiral) computed tomography (CT) is advocated when there is diagnostic doubt in the setting of hemodynamic stability. The alarm features on CT scan which prompt further intervention (diagnostic peritoneal lavage if single abnormality, laparotomy if several abnormalities) include unexplained intraperitoneal fluid, pneumoperitoneum, bowel wall thickening, mesenteric fat stranding, mesenteric hematoma, extravasation of bowel contents and free blood [9]. Notwithstanding this, clinical vigilance is mandatory as a negative CT scan may miss a bowel perforation in 13% of cases [13].

The surgical management of gastric injury is largely dictated by the grade of injury [which reflects the nature (hematoma vs laceration), extent and location of the injury – Table 1] as well as by the presence of associated injuries. A management algorithm has been suggested (Fig. 2) and a summary of the literature is provided in Table 2. At laparotomy it is mandatory to exclude a separate gastric laceration (for example, along the posterior gastric wall). Grades 1 to 3 gastric injuries (the majority of gastric injuries) are amenable to primary repair; a 2 layer closure is advocated to effect hemostasis. Grade 4 (tissue loss with devascularization affecting b50% of stomach) and Grade 5 (tissue loss with devascularization affecting N50% of stomach) gastric injuries are uncommon, associated with other organ and major vascular injuries; affected patients rarely reach hospital alive. In the light of the extent of the injuries, primary repair will not be feasible in patients with Grades 4 and 5 gastric injuries. Depending on the location of the tissue loss (proximal vs distal stomach) and extent of devascularization, sub-total or rarely total gastrectomy may have to be undertaken. The options to restore gastrointestinal continuity will be influenced by the presence of associated injuries (to duodenum, bile duct and pancreas) and include a gastro-duodenostomy, gastro-jejunostomy or a Roux-en-Y reconstruction. [1].



Suggested management of blunt gastric injury.[1]

CONCLUSION

Severity of the injury, timing of presentation and presentation following the last meal as well as concomitant injuries are important prognostic factors. Prompt diagnosis and timely intervention greatly limits mortality and morbidity associated with blunt gastric injuries.

References

1. Gastric perforation following blunt abdominal trauma M.R. Aboobakar, J.P. Singh, K. Maharaj, S. Mewa Kinoo , B. Singh Department of Surgery and King Edward VIII Hospital, University of KwaZulu-Natal, Durban, South Africa Trauma Case Reports 10 (2017) 12–15
2. D.S. Talton, M.H. Craig, C.A. Hauser, et al., Major gastroenteric injuries from blunt trauma, Am. Surg. 61 (1) (1995) 69–73.
3. V. Bruscagin, R. Coimbra, S. Rasslan, W.L. Abrantes, H.P. Souzac, N. Gasparini, et al., Blunt gastric injury. A multicentre experience, Inj. Int. J. Care Injured 32 (2001) 761–764.
4. E.E. Moore, G.J. Jurkovich, M.M. Knudson, et al., Organ injury scaling VI: extrahepatic biliary, oesophagus, stomach, vulva, vagina, uterus (non-pregnant), uterus (pregnant), fallopian tube, and ovary, J. Trauma 39 (1995) 1069–1070.
5. R.D. Yajko, F. Seydel, C. Trimble, Rupture of the stomach from blunt abdominal trauma, J. Trauma 15 (3) (1975) 177–183.
6. R. Maheshwari, A. Sayana, P. Mahesh, Gastric rupture following blunt trauma abdomen: a case report, Indian J. Clin. Pract. 23 (12) (2013) 859–860.
7. P.K. Hota, M. Babu, G. Satyam, Ch. Praveen, Traumatic gastric rupture following blunt trauma abdomen: a case series, Bali Med. J. 3 (1) (2014) 49–52.
8. P.A. Courcy, C. Soderstrom, S. Brotman, Gastric rupture from blunt trauma. A plea for minimal diagnostics and early surgery, Am. Surg. 50 (8) (1984) 424–427.
9. M.A. Croce, T.C. Fabian, Jh. Patton Jr., et al., Impact of stomach and colon injuries on intra-abdominal abscess and the synergistic effect of haemorrhage and associated injury, J. Trauma 45 (1998) 649.
10. J.A. Weinberg, C. Timothy, T.C. Fabian, Injuries to the stomach, small bowel, colon and rectum, Trauma Therm. Inj. 7 (2005) 1–8.
11. L.E. Vassey, R.L. Klecker, E. Koch, et al., Traumatic gastric perforation in children from blunt trauma, J. Trauma 15 (3) (1975) 184–186.
12. J.A. Asensio, D. Demetriades, D.E. Hanpeter, E. Gambaro, S. Chahwan, Management of pancreatic injuries, Curr. Probl. Surg. 36 (5) (1999) 325–419.
13. S.M. Fakhry, D.D. Watts, F.A. Luchette, EAST Multi-Institutional Hollow Viscus Injury Research Group, Current diagnostic approaches lack sensitivity in the diagnosis of perforated blunt small bowel injury: analysis from 275,557 trauma admissions from the EAST multi-institutional HVI trial, J. Trauma 54 (2) (2003) 295–306.
14. J.L. Isenhour, J. Marx, Advances in abdominal trauma, Emerg. Med. Clin. North Am. 25 (2007) 713.

How to cite this article:

Cheikh Malaaynine M.F., Rabbani K., Lammat H., Louzi A and Finech B (2020) 'A Post Traumatic Gastric Big Bang', *International Journal of Current Medical and Pharmaceutical Research,* 06(01), pp 4891-4894.

****