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Case Report

Delayed splenic rupture following abdominal trauma: a case report

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ABSTRACT

We present the case of a 20-year-old male who presents multiple traumas of the abdomen 26 days prior to his return to the emergency room. Going again to evaluation with frank data of peritoneal irritation, since there is no hemodynamic commitment, a contrasted abdomen computed tomography (CT) scan is requested, finding a grade III splenic lesion, which is why he is admitted for emergency splenectomy. This case reports a splenic injury with the need for delayed splenectomy.

Keywords: Abdominal injuries, Blunt splenic injury, Closed abdominal trauma, Delayed splenic rupture, Latent period of Baudet

INTRODUCTION

In abdominal traumas, the spleen is the most frequently injured solid organ, representing up to 35% of all injured solid organs in trauma.[1] Post-traumatic splenic rupture occurs due to blunt abdominal injuries of varying intensity that impact the left hemiabdomen, typically in car accidents, work accidents, falls or injuries.[2]

It's defined delayed haemorrhage from a ruptured spleen as that occurring more than 48 hours following trauma. This interval, known as Baudet's latent period, can vary significantly. Several instances have been documented where bleeding occurred months after the initial injury. In 50 percent of cases, hemorrhage happens within one week of the injury, and in 75 percent of cases the latent period is under two weeks.[3] The importance of delayed rupture of the spleen lies in the relatively high mortality (5-15%) when compared to the 1% mortality associated with acute splenic injury.[4]

Multi-detector computed tomography (MDCT) is currently considered as the first-line imaging modality to detect splenic lesions with a sensitivity and specificity that reaches 95%.[5] In hemodynamically stable patients, an MDCT with intravenous contrast is recommended to determine the presence of splenic lesions. As well as evidence of contrast extravasation that makes us suspect active internal bleeding. The most widely used classification for BSI has been established by the American Association for trauma surgery (AAST spleen injury scale). Classify splenic injuries into 5 degrees with respect to bruises and lacerations, as well as in the depth of them. Normally, grade I and grade II injuries are considered low-grade and these are managed conservatively (Table 1).[1]

While the exact mechanism of delayed splenic rupture (DSR) is not known, there are several theories proposed to explain the pathophysiology of DSR. These theories include: increased capsular pressure secondary to clot lysis and subsequent increased oncotic pressure causing a free

rupture of the spleen capsule; tamponade of the a perisplenic hematoma by surrounding organs or omentum which will later rupture freely into the peritoneal cavity; and delayed bleeding that may be caused by the rupture of a post traumatic intraparenchymal pseudoaneurysm or splenic pseudocyst.[6]

Table 1: Grading scale for splenic injury.

Grade	Injury type	Description of injury
I	Hematoma	Subcapsular, <10% surface area
	Laceration	Capsular tear, <1 cm, parenchymal depth
II	Hematoma	Subcapsular, 10-50% surface area; intraparenchymal, <5 cm in diameter
	Laceration	Capsular tear, 1-3 cm parenchymal depth that does not Involve a trabecular vessel
III	Hematoma	Subcapsular, >50% surface area or expanding; ruptured subcapsular or parenchymal hematoma; intraparenchymal hematoma >5 cm or expanding
	Laceration	>3 cm parenchymal depth or involving trabecular vessels
IV	Laceration	Laceration involving segmental or hilar vessels producing major devascularization (>25% of spleen)
V	Laceration	Completely shattered spleen
	Vascular	Hilar vascular injury with devascularized spleen

CASE REPORT

It was a 20-year-old male patient with a history of hospitalization after receiving multiple bruises in the abdomen 26 days before, a patient during the previous hospitalization without abdominal involvement data, which is why he was discharged after pain control. The patient presented clinical signs of abdominal irritation without hemodynamic compromise, for which reason a CT scan of the abdomen with contrast was requested. In the tomographic study, the patient presented splenic laceration with subcapsular hematoma, extensive amount of free fluid in the abdominopelvic cavity with hematic remains towards left parietocolic groove and pelvic cavity (hemoperitoneum) (Figure 1). In addition to presenting significant amount of free fluid in the abdominal cavity and pelvic cavity, the component with the highest density (58 UH) towards the left parietocolic groove, left iliac fossa and pelvic cavity that suggests a blood component (hemoperitoneum) (Figure 2). The patient underwent an emergency exploratory laparotomy. A splenectomy was performed, revealing 2 liters of blood in the abdominal cavity. Consequently, an abdominal lavage was conducted.

The patient demonstrated good clinical evolution post-surgery and was discharged 48 hours later, with the clinical picture resolving satisfactorily.

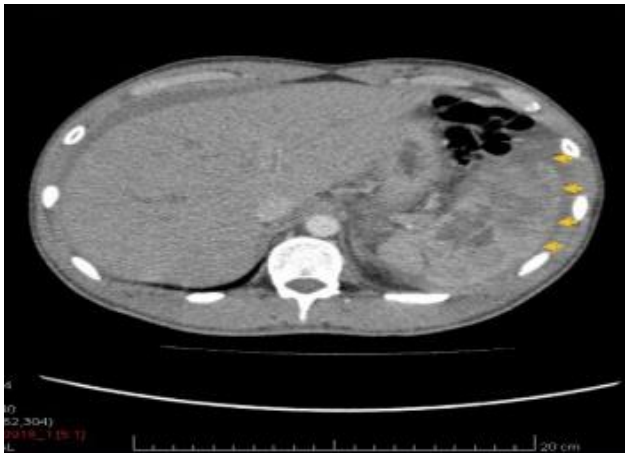

Figure 1: CT Axial splenic laceration with splenic hematoma.

Figure 2: CT with hemoperitoneum.

DISCUSSION

Being a rare entity, differential diagnoses in acute abdomen are a challenge for the general surgeon. Delayed splenic injury should not be ruled out in abdominal trauma as a diagnosis in those patients with a history of abdominal trauma and hemodynamic instability, which would lead to a surgical emergency. The splenic rupture requires multidisciplinary treatment by highly trained health personnel, involving surgeons, radiologists,

interventionalists and the intensive care unit (ICU) if necessary. In the vast majority of patients, conservative treatment is recommended as long as they are hemodynamically stable and there is no evidence of hemorrhage. However, it must be monitored. The results of patients managed non-surgically are good.[5]

In hemodynamically unstable patients with a positive FAST scan with a history of trauma, surgical examination should be considered, however in patients with a negative FAST scan an intra-abdominal hemorrhage should not be completely ruled out.[7]

The MDCT scan is the gold-standard in hemodynamically stable patients, it can determine the degree of injury, in addition to signs that make us suspect internal bleeding. The latter will require surgical examination or angioembolization.[8]

However, MDCTs can underestimate the degree of injury, so surgeons must do a clinical and paraclinical analysis of the patient to determine what the plan to follow will be.[9]

However, history of minor trauma might have been overlooked in these cases. Hence, a detailed history of major or minor trauma in the preceding weeks must be elicited for any patients presenting with abdominal pain. The high mortality and morbidity rate can be prevented by carefully monitoring patients with splenic injury with hematoma without surgical requirement at the time.

CONCLUSION

In conclusion, a high index of suspicion, close monitoring and careful observation and investigation, and timely management can go a long way in reducing morbidity and high mortality rates in delayed splenic rupture following minor trauma

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REFERENCES

1. El-Matbouly M, Jabbour G, El-Menyar A, Peralta R, Abdelrahman H, Zarour A, Al-Hassani A, Al-Thani H. Blunt splenic trauma: Assessment, management and outcomes. Surgeon. 2016;14(1):52-8.
2. Buhaş CL, Mihalache GC, Judea-Pusta CT, Daina LG, Muţiu G, Buhaş BA, et al. The importance of the histopathological examination in establishing the diagnosis of delayed splenic rupture. Report of a case and literature review. Rom J Morphol Embryol. 2019;60(1):281-6.
3. Foster RP. Delayed haemorrhage from the ruptured spleen. Br J Surg. 1970;57(3):189-92.
4. Peitzman AB, Heil B, Rivera L, Federle MB, Harbrecht BG, Clancy KD, et al. Blunt splenic injury in adults: Multi-institutional Study of the Eastern Association for the Surgery of Trauma. J Trauma. 2000;49(2):177-87.
5. Khan SA, Muhammad I, Laabei F, Rothwell J. An unusual presentation of non pathological delayed splenic rupture: a case report. Cases J. 2009;2:6450.
6. Hamidian Jahromi A, Migliaro M, Romano M, Sangster G. Delayed Splenic Rupture; Normal Appearing Spleen on the Initial Multidetector Computed Tomography (MDCT) Can Sometimes Be Misleading. Trauma Mon. 2016;21(5):e24465.
7. Basukala S, Tamang A, Bhusal U, Sharma S, Karki B. Delayed splenic rupture following trivial trauma: A case report and review of literature. Int J Surg Case Rep. 2021;88:106481.
8. Kozar RA, Crandall M, Shanmuganathan K, Zarzaur BL, Coburn M, Cribari C, et al. Committee Organ injury scaling 2018 update: spleen, liver, and kidney. J Trauma Acute Care Surg. 2018;85:1119-22.
9. Shapiro MJ, Krausz C, Durham RM, Mazuski JE. Overuse of splenic scoring and computed tomographic scans. J Trauma. 1999;47:651-8.

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