LESS

Case Report

Laparosc Endosc Surg Sci 2019;26(3):121-123
DOI: 10.14744/less.2019.05924

Laparoscopic surgery for a liver gunshot injury

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ABSTRACT

Recently, non-operative follow-up in non-penetrating abdominal injuries is often preferred. However, emergency laparotomy still remains the most exclusive method of treatment for gunshot wounds of the abdomen and laparoscopic approach is rarely reported in selected cases. In this study, our aim is to share our experience in a case with abdominal gunshot wound who was treated by a laparoscopic surgery. A 52-year-old male patient admitted with a gunshot wound that was penetrating to the abdomen. The gunshot line was from left subcostal to the right mid-axillary. He was hemodynamically stable but had abdominal sensitivity. Computed tomography confirmed the liver injury. Laparoscopic exploration was performed with three ports. A tunnel-shaped injury was detected through the liver segments 4–7 and hemostasis of the bleeding liver parenchyma was achieved by laparoscopy. No other abdominal organ injuries were detected. The patient had an uneventful postoperative course and discharged on the third day and had no complaints during the six months follow-up. In certain circumstances, laparoscopy can be used both for diagnosis and treatment of penetrating gunshot wounds and may reduce the risk of unnecessary laparotomy.

Keywords: Bullet; firearm; hepatic; minimally invasive surgery.

Introduction

Non-operative treatment in blunt abdominal injuries is considered to be an increasing treatment method for same appropriate patients but emergency laparotomy is still generally accepted in abdominal penetrating gunshot wounds.[1] Recently, non-operative treatment has come to the fore even in the treatment of gunshot wounds in cases of suspected abdomen penetration.[2] Laparoscopy is being used in the diagnosis of abdominal penetration and laparotomy is often used when a penetration to the abdomen is detected or when a therapeutic procedure is required. In this case, we aimed to present a patient who had penetrating abdominal gunshot injury and underwent a diagnostic and therapeutic laparoscopic approach.

Case Report

A 52-year-old male presented with a gunshot (revolver) injury. He had no previous history of surgery or co-morbid disease. The patient was conscious, blood pressure 90/60 mmHg, pulse rate 95/min and respiratory rate was 20/min. A gunshot tract was between the 3 cm below of the left costal arcus on the mid-clavicular line (entrance), the right mid-axillary line at the nipple level (exit). Another gunshot injury was detected to the scrotum. Hemoglobin 12.6 g/dL, AST 128 U/L, ALT 121 U/L and creatinine kinase was 912 U/L. On computed tomography, a bullet tract was observed between the left mid-clavicle line and the hepatic segment 4–7. In addition, some free fluid was detected in the abdomen (Fig. 1a, b). The patient had abdom-

Received: 22.07.2019 **Accepted:** 26.08.2019
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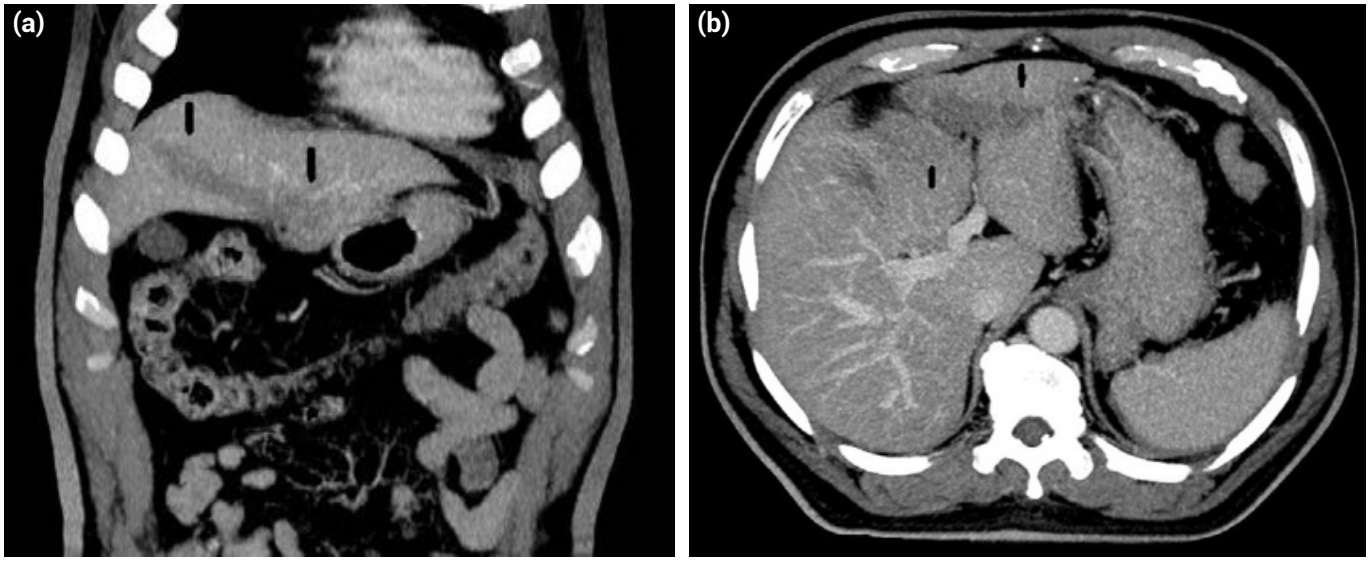

Figure 1. (a) Coronal section tomography. **(b)** Axial section tomography.

inal sensitivity and laparoscopic exploration decision was taken after the informed onsent of the patient. Urological intervention for the scrotal injury was done at the end of the abdominal procedure.

Operative Tecnique

The patient position for laparoscopy was French position (supine, legs apart). Pneumoperitoneum was done by Veres needle through the umbilicus. The first 10 mm trocar was inserted from umblicus. After exploration of the abdominal organs, two 5 mm trocars were placed to the mid clavicular lines from right and left sides. Bullet entrance localization in liver segment 4 and exit localization in segment 7 were detected. The active bleeding sites in the liver parenchyma were cauterized until no active bleeding was observed. Inside of the abdomen, 300 ml blood was aspirated. The stomach, splenic flexure of colon, transverse colon, spleen, and all small intestinal segments were explored. No additional injuries were detected, drain was placed near to liver hillum from the left trocar site. Operation time was 45 minutes. Oral feeding started on the first postoperative day, the drain removed on second day and the patient was discharged on day 3. The patient had no complication following 5 months.

Discussion

Non-operative follow-up in blunt abdominal trauma reduced unnecessary laparotomy rates.[3,4] It is possible to reduce the unnecessary laparotomy rates more and more by performing diagnostic laparoscopy.[5] Non-operative treatment option was not an indication for penetrating abdominal wound due to the risk of missing injuries and the medicolegal issues. In a meta-analysis on penetrating abdominal; half of the patients had not treatment required injuries, one-fourth patients could be treated by laparoscopy, an in total 75% of patients with penetrating abdominal traumas were found to have saved from laparotomy.[6] The majority of patients in this meta-analysis consisted of stab injuries. From a 10-year experience at a level 1 travma center, only 26 patients with abdominal gunshot injuries were evaluated by laparoscopy and 18 of these patients underwent laparoscopy for tangential gunshot wounds to rule out penetration of the peritoneal cavity. The rate of therapeutic laparoscopy in penetrating (stab and firearm injuries) was quite lower (10%).[7] Here, we avoided laparotomy by using laparoscopy for the aim of both diagnosis and treatment of liver travma.

The management of penetrating trauma should be based on serial clinical examinations, laboratory parameters and imaging studies. Because of the risk of missing abdominal injuries, non-operative treatment of penetrating injuries; should be closely monitored.[8,9] In cases hemodynamically stable and tolerable to the abdominal insufflation, laparoscopic exploration can be preferred, and problems that may arise with a delayed intervention can be alleviated.[5] Although the sensitivity of laparoscopy to penetrating abdominal trauma has been reported as 18% in earlier publications, this rate was reported as 100% in new studies.[6,10] Careful and systematic inspection during laparoscopy, patient position change and use of atraumatic instruments are useful tools for laparoscopic exploration of abdominal organs.[11] Increasing experience with

adequate equipments can reduce overlooked injury rate to below 1%.[6] In the literature, diagnostic laparoscopy was used in stab wound injuries but rarely in firearm injuries and its therapeutic use is quite rare.[6]

Conclusion

In certain circumstances, laparoscopy can be an alternative to laparotomy in an abdominal penetrating gunshot wound for diagnosis and also treatment.

Disclosures

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

References

1. Böyük A, Gümüş M, Önder A, Kapan M, Aliosmanoğlu I, Taşkesen F, et al. Splenic injuries: factors affecting the outcome of non-operative management. Eur J Trauma Emerg Surg 2012;38:269–74.
2. Navsaria PH, Nicol AJ, Edu S, Gandhi R, Ball CG. Selective nonoperative management in 1106 patients with abdominal gunshot wounds: conclusions on safety, efficacy, and the role of selective CT imaging in a prospective single-center study. Ann Surg 2015;261:760–4.
3. Stassen NA, Bhullar I, Cheng JD, Crandall M, Friese R, Guillamondegui O, et al; Eastern Association for the Surgery of Trauma. Nonoperative management of blunt hepatic injury: an Eastern Association for the Surgery of Trauma practice management guideline. J Trauma Acute Care Surg 2012;73(5 Suppl 4):S288–93.
4. Okuş A, Sevinç B, Ay S, Arslan K, Karahan Ö, Eryılmaz MA. Conservative management of abdominal injuries. Ulus Cerrahi Derg 2013;29:153–7.
5. Eskioğlu E, Ertekin C, Günay K, Taviloğlu K, Güloğlu R. The comparision of diagnostic peritoneal lavage and diagnostic laparoscopic findings in abdominal trauma. Ulus Travma Acil Cerrahi Derg 1997;3:78–87.
6. O'Malley E, Boyle E, O'Callaghan A, Coffey JC, Walsh SR. Role of laparoscopy in penetrating abdominal trauma: a systematic review. World J Surg 2013;37:113–22.
7. Johnson JJ, Garwe T, Raines AR, Thurman JB, Carter S, Bender JS, et al. The use of laparoscopy in the diagnosis and treatment of blunt and penetrating abdominal injuries: 10-year experience at a level 1 trauma center. Am J Surg 2013;205:317–20; discussion 321.
8. Zafar SN, Rushing A, Haut ER, Kisat MT, Villegas CV, Chi A, et al. Outcome of selective non-operative management of penetrating abdominal injuries from the North American National Trauma Database. Br J Surg 2012;99 Suppl 1:155–64.
9. Hope WW, Smith ST, Medieros B, Hughes KM, Kotwall CA, Clancy TV. Non-operative management in penetrating abdominal trauma: is it feasible at a Level II trauma center? J Emerg Med 2012;43:190–5.
10. Ivatury RR, Simon RJ, Stahl WM. A critical evaluation of laparoscopy in penetrating abdominal trauma. J Trauma 1993;34:822–7; discussion 827–8.
11. Lin HF, Wu JM, Tu CC, Chen HA, Shih HC. Value of diagnostic and therapeutic laparoscopy for abdominal stab wounds. World J Surg 2010;34:1653–62.