

Multiple projectile gunshot lumbar trauma with multi-visceral lesion

Traumatismo lumbar por arma de fuego de proyectiles múltiples con lesión multivisceral

Aimeé T Santana-Torrealba*

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Penetrating wounds, emergencies, surgeons.

Palabras clave:

Heridas penetrantes, emergencias, cirujanos.

ABSTRACT

We present a case of penetrating trauma in the lumbar region by multiple projectile firearm that involved damage to multiple organs. It is considered a surgical emergency, although with infrequent presentation. In such cases the surgeon must make decisions and act immediately to improve the patient's survival. Clinical and paraclinical data, its management and evolution are presented, in addition to comparing the with the related medical literature.

RESUMEN

Se presenta caso de trauma penetrante en región lumbar por arma de fuego de proyectiles múltiples que implicó daño en múltiples órganos, considerado una urgencia quirúrgica, aunque con presentación poco frecuente. En dichos casos el cirujano debe tomar decisiones y actuar de forma inmediata para mejorar la supervivencia del paciente. Se exponen datos clínicos, paraclínicos, su manejo y evolución, además de compararlo con escrutinio con la literatura médica relacionada.

INTRODUCTION

In Latin America with impoverished economies and social strata, interpersonal violence is the most frequent cause of death and disability in persons under 45 years of age.¹ Venezuela currently has no record of trauma prevalence, but according to the 2018 report of the violence observatory, a rate of 81.4 violent deaths per 100,000 inhabitants was recorded for a total of 23,047 deaths nationwide.²

Penetrating lumbar trauma from multiple projectile firearms is infrequent but is considered an emergency at the time of admission. The injuries can be complex and affect various organs and intra-abdominal viscera, so the surgeon must act immediately to reduce morbimortality even in institutions with a lack of resources. Studies have shown that overall survival correlates with the number of injured organs; the risk of death doubles with each additional injured organ and

survival drops significantly when four or more organs are injured.³ Since the last years of the 20th century, a damage control strategy has been applied in severe abdominal injuries; initial management is limited to adequate hemostasis, removal of contamination, and prevention of abdominal hypertension by temporary closure. Then, if the injured person during his stay in intensive care compensates for all his general imbalances, one or more operations are planned without further urgency for definitive repair of the injuries.⁴ Of all penetrating traumas in the lumbar region, only 25% have visceral injury; however, it is possible that there are hidden injuries, so the biggest problem is to diagnose injuries that may initially go unnoticed. The main injuries due to penetrating wounds in the lumbar region are those of the kidney, colon, and liver, and it is necessary to be alert to the clinical manifestations of each one of them. It is established that patients with peritonitis, shock

* Adjunct Specialist of the General Surgery Service. University Hospital "Dr. Luis Razetti". Barcelona, Anzoátegui State, Venezuela.

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or blood loss through the gastrointestinal tract will require laparotomy, but retroperitoneal injuries, especially of the colon, may go unnoticed until they have late manifestations.⁵ At present, in patients with penetrating wounds in the dorsal region, the first evaluation tool is the clinical examination. If the patient is unstable, with peritonitis or blood loss from the rectum, an exploratory laparotomy is indicated. However, if the patient does not meet the criteria for immediate surgical exploration and the clinical evaluation is not reliable, he/she shall be studied with computed tomography, and depending on the result, he/she will be transferred to trauma observation or intensive care units, where he/she will continue to be evaluated, with continuous monitoring of the hemodynamic status of the patient with paraclinical and imaging control in the following hours.⁶

CASE PRESENTATION

A 19-year-old female patient with a history of allergy to metamizole sodium and segmental cesarean section in 2015 without complications, was admitted to the emergency department of the University Hospital "Dr. Luis Razetti" after multiple gunshot wounds in the bilateral lumbar region, predominantly on the right.

Physical examination: Her heart rate was 110 beats per minute, blood pressure of 90/50



Figure 1: Patient on admission. Projectile orifices caused by multiple discharges.

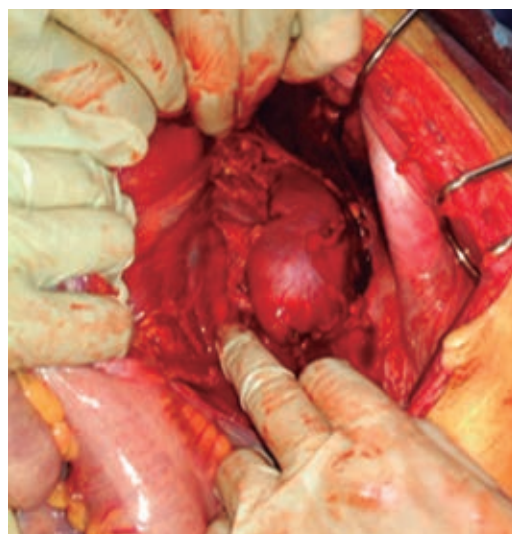


Figure 2: Left renal lesion.

mmHg, respiratory rate of 21 per minute a temperature of 36.6 °C. Her skin was brown with generalized mucosal pallor and a capillary filling less than 3 seconds. The cardiopulmonary examination showed a symmetrical thorax, hypo-expandable predominantly in the right hemithorax. Multiple gunshot holes in the lower region of the left posterior hemithorax and lower third of the right posterolateral hemithorax were seen with diminished respiratory sounds in the lower third of the right hemithorax without aggregated abnormal sounds. The heartbeat sounds were heard rhythmic and regular without any murmurs or gallop rhythm. Her abdomen was distended, with decreased hydro-aerial sounds, painful on palpation with signs of generalized peritoneal irritation. In the lumbar region multiple firearm projectile orifices in bilateral lumbar region predominantly on the right (*Figure 1*) were observed. The rectal examination showed a tonic external anal sphincter, blistered stool, and a bulging cul-de-sac. The extremities were symmetrical, eutrophic and without edema. Neurologically the patient was conscious and oriented in time, space, person.

She was taken to the operating room and an exploratory laparotomy was performed and the following findings were observed: 1) There were 1,500 cm³ of hemoperitoneum and another 1,000 cm³ that occurred intraoperatively. 2)

An expandable retroperitoneal hematoma in the right zone II right in expansion and a non-expandable hematoma in the left retroperitoneal zone II. 3) Multiple lesions < 0.5 cm at the right renal level with involvement of the hilum. 4) Multiple non-bleeding lesions < 0.5 cm at the left renal level without hilum involvement (Figure 2). 5) Two 0.5 cm lesions were seen on the vesicular fundus. 6) Multiple lesions in < 50% of the ascending colon up to the hepatic angle of transverse colon. 7) Multiple lesions < 50% of thin loop of 175 cm of longitude up to 250 cm of the fixed loop (40 cm from ileocecal valve). 8) A < 50% lesion of the descending colon. 9) Multiple punctate hepatic < 1 cm deep non-bleeding lesions in segments V, VI, VII and VIII. 10) A punctate serous lesion in the posterior face in the body of the stomach. 11) A 2 cm lesion of right hemidiaphragm towards its posterior insertion. 12) A non-bleeding 1 cm deep and 1 cm long lesion in the lower pole of the spleen. 13) A < 0.5 cm non-bleeding lesion in the right ovary. and 14) The rest of the abdominal organs were seen unharmed.

During the surgery, the following procedures were performed: hemoperitoneum evacuation, a thorough systematic revision of the abdominal cavity, the Cattell Branch Cattell-Braasch maneuver, right nephrectomy, the Mattox maneuver the Kocher maneuver, cystic-fundal cholecystectomy, a ileo-transverse end-to-end anastomosis, closure of the anastomotic gap, a descending colon raffia, gastric raffia, diaphragmatic raffia, placement of a passive tubular 24 Fr drain in the Morrison's space, the placement of a 24 Fr passive tubular drain in

the left retroperitoneal zone II, placement of internal tension stitches, and a minimal right thoracotomy plus placement of a thoracic drain (150 cm³ of hematic content plus air were found). During surgery, she received one unit of packed red blood cells and one unit of whole blood and was subsequently transferred to the intensive care unit in stable condition. She had a satisfactory clinical evolution and after 48 hours she was transferred to the regular hospitalization area. She had a passive drainage through the Nelaton tube placed in the Morrison's space of biliary aspect whose cytochemical analysis showed a blackish cloudy alkaline content with a density of 1.015. Her red blood cell count was 5,000, a white blood cell count 1,500 with 64 neutrophils, serum glucose of 64, proteins 22, a negative Rivalta test, LDH of 284, total bilirubin of 7.5, direct bilirubin of 2.5 and indirect bilirubin of 5.1. All these values were compatible with a biliary fistula.

She was evaluated jointly with the nephrology, nutrition, and neurosurgery services. She received three units of red packed cells during her hospitalization. She was monitored with water balance control, paraclinical and hemodynamic control, drain output, and pleural tube management, plus daily wound healing. On the fifth day of hospitalization, the drain placed in the cul-de-sac was removed due to lack of output. On the ninth day, there was a spontaneous exit of the drain placed in the Morrison space while still maintaining biliary output. an ultrasound-guided drain re-canalulation was

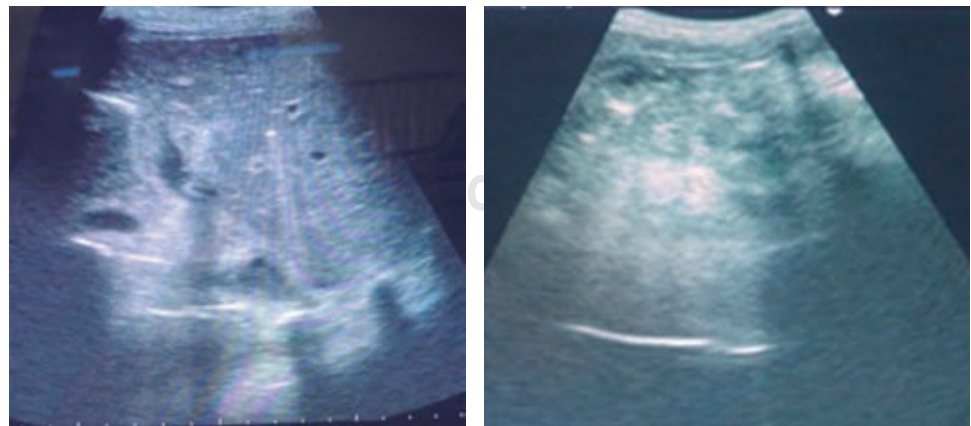


Figure 3:

Eco-guided re-canalulation of the Morrison's drain.

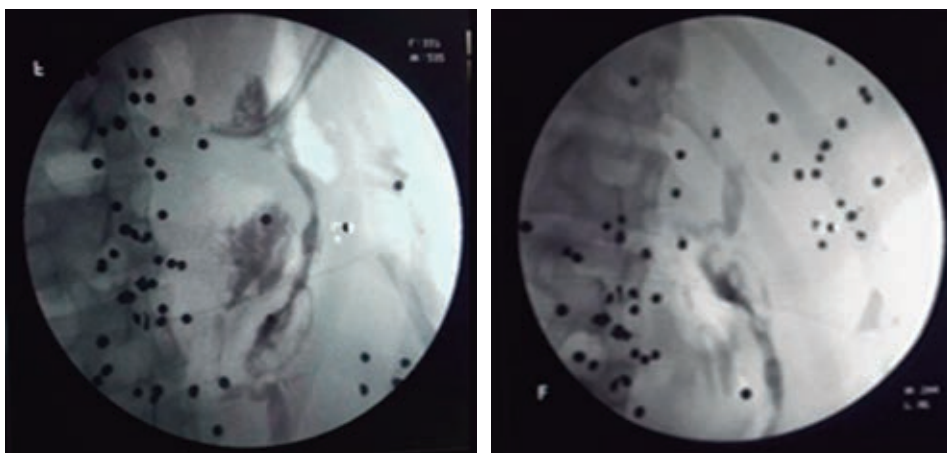


Figure 4:

Fistulography after discharge.

performed (Figure 3). On the tenth day the thoracic drainage tube was removed due to good pulmonary expansibility. She was then discharged from the hospital.

As part of her postoperative control a fistulography study was performed (Figure 4). The drainage was removed two months after discharge, and she had a low drainage output for five weeks until its cessation.

DISCUSSION

In gunshot wounds, Moore and Marx mention that 80% of them are penetrating and that in 95% of them there is visceral damage,⁷ such as was seen in the case just described, which after a gunshot trauma the patient had diaphragmatic, pleural, hepatic, biliary, renal, gastric, splenic, intestinal and ovarian injuries. She was admitted to the emergency department with clinical signs of peritoneal irritation and signs of hemodynamic instability, and immediate surgical intervention was decided, as recommended by a study of 2,212 patients with penetrating wounds of the abdomen treated in three Charity hospitals.⁸ Hemodynamic instability and signs of peritoneal irritation are absolute indications for emergency laparotomy. Patients with penetrating abdominal trauma often have multiple injuries which, in addition to injuries to solid organs and vascular structures, involve hollow viscera, biliopancreatic tree and urological structures.⁹ The error lies in delaying surgical intervention when it is mandatory.¹⁰ As a postoperative complication, a biliary fistula

was evidenced and diagnosed, and was treated expectantly with drainage and performing a control fistulography. Once the drain was removed, spontaneous closure occurred after 37 days, in agreement with the study by Hollands and Little in which they describe that expectant management in patients with biliary fistula continues to be an efficient tool in patients with severe hepatic trauma, with a median number of spontaneously closed biliary leaks after 33-44 days.¹¹

CONCLUSION

Every firearm trauma represents an emergency; the exhaustive physical examination, hemodynamic control, paraclinical and imaging studies such as computed tomography scan may guide and define the treatment, either conservative with a non-operative management or with an early surgical intervention that may result in definitive surgery or in a staged damage control surgery that may reduce the patient's morbidity and mortality. The surgical procedure should never be delayed.

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Correspondence:**Aimeé T Santana-Torrealba**Barcelona, Avenida Rotaria,
Barcelona 6001, Anzoátegui.**E-mail:** aimeesantana01@gmail.com