

Severe soft tissue injury resulting from motorcycle accidents

Lesão grave de partes moles decorrente de acidente motociclístico

Bruno de Lima Rodrigues¹, André Rosetti Portela², Mario Pastore Neto¹, Domingos André Fernandes Drumond³

DOI: 10.5935/2238-3182.20130082

ABSTRACT

Severe trauma injuries increased in numbers, partly as a result to the escalation of motorcycle accidents related to increase in the fleet of this kind of vehicle. Abdominal wall trauma can sometimes cause high mortality, either by damage to intra-abdominal viscera or by injury to the abdominal wall itself. This report describes the severity of injuries in trauma from motorcycle accidents, as well as the surgical procedures adopted.

Key words: Accidents; Traffic; Motorcycles; Soft Tissue Injuries; Abdominal Injuries.

RESUMO

Lesão grave em trauma tem aumentado, em parte relacionada à elevação do número de acidentes motociclísticos, o que tem sido associado ao aumento da frota desses veículos, observado nos últimos anos. O trauma de parede abdominal causa, por vezes, alta morbimortalidade, seja por comprometimento das vísceras intra-abdominais, seja pela lesão da parede abdominal. Este caso descreve a gravidade das lesões em trauma decorrente de acidente motociclístico, além de conduta cirúrgica adotada.

Palavras-chave: Acidentes de Trânsito; Motocicletas; Lesões dos Tecidos Moles; Traumatismos Abdominais.

INTRODUCTION

Motorcycle accidents have considerably increased the demand for accident and emergency hospital care in the whole country. At Hospital João XXIII in Belo Horizonte, of the 17,090 patients hospitalized for motor vehicle accidents in 2008, 8,447 were motorcycles (around 50% of all accidents). These lesions have been increasingly serious due to several factors, include speed, lack of specific traffic legislation, recklessness, etc.

Rupture of the abdominal wall resulting from blunt trauma is a rare occurrence and its treatment is challenging. immediately repairing the lesion is difficult, particularly when there is high degree of tissue destruction.¹

Certain cases require treatment postponement and use of autogenic tissue such as the fascia lata, rectus abdominis, and dorsal muscles. Abdominal wall reconstruction using prosthesis is also possible but can be a source of complication, given that these lesions are often contaminated, mostly by residues associated with the environment in which the accident happened or the associated visceral injuries.

Few cases have been reported in the current literature.^{2,3}

Submitted: 08/19/2009
Approved: 09/25/2013

Institution:
General and Trauma Surgery Service,
Hospital João XXIII-FHEMIG
Belo Horizonte, MG – Brasil

Corresponding Author:
Mario Pastore Neto
E-mail: mario-pastore@uol.com.br

Wall hernia is defined as a protrusion of abdominal contents under the skin^{3,4}. Herniation will occur in 100% of cases when there is skin involvement, rupture of the musculoaponeurotic wall structures, and only the skin is repaired.¹

Traumatic ruptures of the abdominal wall, both acute and chronic, are difficult to treat and require multidisciplinary cooperation.

This work aims to report a case from the General and Trauma Surgery Service at Hospital João XXIII, in Belo Horizonte, MG.

CASE REPORT

The victim of a motorcycle accident in a public thoroughfare was admitted into Hospital João XXIII on December 28, 2008. The vehicle was at high speed when it collided and the driver was wearing a helmet. He received emergency care by the paramedic SAMU team and was found to be in GSC 15, eviscerated, with systolic blood pressure of 80 mmHg. Initially, 1,000 mL of NaCl 0.9% was administered, with excellent response.

He was then intubated and a chest x-ray was done, revealing no abnormalities. He was taken to the operating room with hemodynamic stability. Following anesthesia, he was positioned for the procedure, antisepsis was completed, and the cutaneous and subcutaneous planes dissected with an electrocautery resembling that of dermolipectomy, up to the left paramedian plane. He underwent a median xyphopubic laparotomy below the skin flap, the right rectus abdominis was sectioned and inventory of the abdominal cavity was carried out. The following were found:

- grade I transverse colon injury;
- hemorrhagic hepatic lesions in segments II, III, IV and VII, which were sutured, and partial avulsion of the gallbladder from the liver bed, which was resected;
- violation of the thoracic cavity on the right diaphragmatic insertion, with fractures on the 10th and 11th ribs. The ribs and the diaphragm were repaired;
- destruction of the external oblique muscle, the internal oblique muscle having rotated to close the defect of the wall;
- the right chest and the abdominal cavity were drained with an infrahepatic surgical drain number 38. The closure was performed through planes of the lateral abdominal wall with Vicryl® 1. Suturing of the laparotomy with Vicryl® 1.

All fields and cloaks of the surgical team were changed, with new antisepsis of the skin and muscles. A Marlex® mesh (30.5 x 30.5 cm) was applied and attached with prolene® 2.0. Subcutaneous drainage with Port-o-vac® number 3.2 was done, followed by skin sutures and bandaging.

The patient remained in intensive care for 13 days and contracted lung infection as a complication. Extubation occurred on the eighth postoperative day (POD). The patient presented with partial necrosis of the flap. On the 18th POD, the antibiotic therapy was suspended and he was discharged (Figure 1 from A to H).

DISCUSSION

Ruptures of the abdominal wall are not difficult to diagnose; however, their treatment can sometimes be complex.¹ The biggest challenge is to surgically reconstruct the lesion, especially when exploring the abdominal cavity is indicated and concomitant injuries are being treated.

In this case, the associated occurrence of injuries to other viscera made the therapeutic decision-making harder, since laparotomy was indicated. Access to the cavity should be wide. Median laparotomy (usual for this kind of trauma) could be the cause of devascularization of the only full segment of skin and result in total loss of the skin layer of the anterior abdominal wall (Figure 1). The type of wound itself already exposed practically the whole abdominal wall and viscera, in addition to the wall defect.

The dissection and lifting of the skin and subcutaneous tissue reached the midline and allowed a median laparotomy with wide access to the cavity, preserving the base of the “skin flap” and maintaining its vascularization.

Several mechanisms of trauma can lead to injury, as in this description, as noted in: hernia caused by the use of seatbelt; accidents with bicycles, motorcycles, and automobiles; being hit by a car, war wounds, crushing, shearing with increased intra-abdominal pressure.^{1,3-8} The increase in intra-abdominal pressure is more often related to diaphragmatic lesion.⁴

A tangential deceleration mechanism seems to be essential for this type of injury. This, however, rarely happens above the navel, maybe due to the strength of the posterior aponeurosis of the rectus abdominis, which does not occur beneath the arcuate line.³

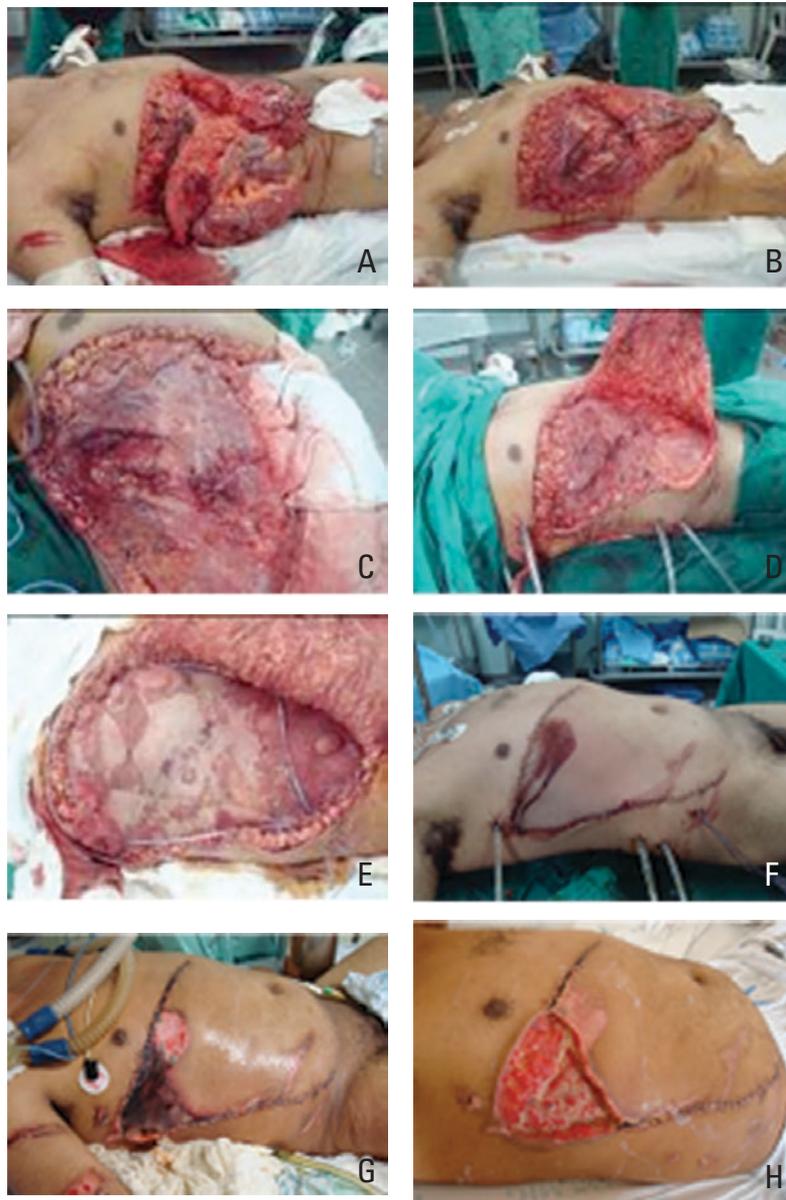


Figure 1 - Severe soft tissue injury resulting from motorcycle accidents.

Traumatic tattoos caused by seatbelts or palpation of abdominal wall ruptures may be related to “seat belt syndrome” and indicate wall hernia; these are more commonly associated with intracavitary lesions. The lesions often associated with the “seat belt syndrome” are found in the colon, spine, spinal chord, and abdominal wall.^{9,10}

Diagnosing associated lesions can be difficult when there is no traumatic rupture of the whole thickness of the wall, as in this report.¹

Imaging tests help greatly in cases of blunt abdominal trauma; however, when there is evisceration they cease to be useful because laparotomy becomes compulsory.

CT is useful to differentiate hematomas from wall muscle tears, as well as for evaluating other lesions.^{11,12}

Abdominal wall tears should be treated immediately, as in this case. Laparotomy is mandatory and recommended as a means of access to median laparotomy. The success rate, however, is low in relation to hernia repairs. Prostheses may also be used but only in the cases with no contamination. Use of mesh was possible in this case due to the absence of hollow visceral injury. Hernia repair must be done in the absence of instability or when all in hollow visceral lesions have already been treated, such as in this case. The best prosthetic material to be used is still a sub-

ject of controversy.^{12,13} In this case, a Marlex® mesh was used because of greater availability.

There are no large series with similar cases, and comparative studies are not possible at the moment. On the other hand, we must strive to reproduce the number of such injuries in motorcycle accidents so as to gather subsidies for creating specific legislation aimed at preventing the occurrence of such violence.

REFERENCES

1. Brenneman FD, Boulanger BR, Antonyshyn O. Surgical management of abdominal wall disruption after blunt trauma. *J Trauma*. 1995 Sept; 39(3): 539-44.
2. Damschen DD, Landercasper J, Cogbill TH, Stolee RT. Acute traumatic abdominal hernia: Case reports. *J Trauma*. 1994 Feb; 36(2):273-6.
3. Gill IS, Toursarkissian B, Johnson SB, Kearney PA. Traumatic ventral abdominal hernia associated with small bowel gangrene: Case report. *J Trauma*. 1993 Jul; 35(1):145-7.
4. Wood RJ, Ney AL, Bubrick MP. Traumatic abdominal hernia: a case report and review of the literature. *Am Surg*. 1988 Nov; 54(11):648-51.
5. Hurwitt ES, Silver CE. Seat belt hernia. *JAMA*. 1965 Nov 15; 194(7):829-31.
6. Dimyan W, Robb J, MacKay C. Handlebar hernia. *J Trauma*. 1980; 20:812-3.
7. Dubois PM, Freeman JB. Traumatic abdominal wall hernia. *J Trauma*. 1981; 21:72-4.
8. Kaude J. Traumatic rupture of the abdominal wall with subcutaneous herniation of the transverse colon and perforation of the small bowel. *Br J Radiol*. 1966 Nov; 39:950-1.
9. Asbun HJ, Irani H, Roe EJ, Bloch JH. Intra-abdominal seatbelt injury. *J Trauma*. 1990 Feb; 30(2):189-93.
10. Appleby JP, Nagy AG. Abdominal injuries associated with the use of seatbelts. *Am J Surg*. 1989 May; 157(5):457-8.
11. Malangoni MA, Condon RE. Traumatic abdominal wall hernia. *J Trauma*. 1983 Apr; 23(4):356-7.
12. Jenkins SD, Klamer TW, Parteka JJ, Condon RE. A comparison of prosthetic materials used to repair abdominal wall defects. *Surgery*. 1983 Aug; 94(2):392-8.
13. Brown GL, Richardson JD, Malangoni MA, Tobin GR, Ackerman D, Polk HC Jr. Comparison of prosthetic materials for abdominal wall reconstruction in the presence of contamination and infection. *Ann Surg*. 1985 Jun; 201(6):705-11.