

Severe blunt renal injury after motorcycle accident: failure of the conservative management



Ann. Ital. Chir., 2021 92, 5: 518-520
pii: S0003469X2103520X

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We report the case of a patient who presented after a motorcycle accident a grade IV kidney lesion primarily treated with a NOM, which failed. We discuss the possibility at admission to select a subgroup of patients with a high grade (IV and V) kidney trauma in whom NOM might fail.

KEY WORDS: Kidney Trauma, High grade renal trauma, Non operative management.

Introduction

Blunt renal trauma (BRT) accounts for 1-5% of all trauma cases¹ and kidney is the most frequently injured abdominal organ after spleen and liver². Renal injuries are usually associated with young age and male gender³. The severity of this injury ranges significantly, and accordingly the management options and outcome⁴. In the past 30 years, the treatment of renal trauma has changed from an operative to a non-operative management (NOM) for patients with a hemodynamic stability. However, emergent nephrectomy might be considered for patient with uncontrollable hemorrhage, hemodynamic instability, unresponsive to aggressive resuscitation, with a high-grade injury and an expanding or pulsatile perirenal hematoma found during laparotomy performed to treat associated injuries. We present the case of a patient affected with a grade IV blunt renal trauma in whom the NOM failed. We present this case because of the challenging option to proceed to a NOM instead of an operative treatment to save the injured organ.

Case Report

A 43-year-old white female was admitted as an emergency to our Institution after a motorcycle accident. On arrival, she was agitated, arterial blood pressure was 90/60 mmHg, heart rate 120 beats/min, respiratory rate 28 breaths/min and transcutaneous oxygen saturation 98%. Physical exam revealed a pale skin, pain in the left flank and a marked tenderness in the left abdomen. Urine mixed with gross blood was evacuated after a catheter placement. Past medical history was uneventful. Hematochemical test were within the normal range except for an alteration of the liver function test [(AST, 966 U/L (n.v. 8 - 38); ALT, 636 U/L (n.v. 12 - 41)]. Extended focused assessment with sonography for trauma (eFAST) revealed the presence of free fluid into the abdominal cavity and a right pneumothorax, immediately treated with pleural drainage. A CT scan demonstrated a grade II lesion of V, VI, and VII liver segments, a grade I spleen lesion and a grade IV right kidney injury with active bleeding from a ruptured renal artery and an intact inferior polar artery, with no apparent lesion of the renal pelvis (Fig. 1A). The patient was hemodynamically stable and an attempt to NOM was decided because of the possibility to save the organ. Selective angiography of the right renal artery confirmed extravasation of contrast medium and the rupture of the middle third of the right renal artery. The inferior polar artery was patent and perfusing more than half of the kidney. The ruptured artery was embolized (Fig. 1B).

Pervenuto in Redazione Novembre 2020. Accettato per la pubblicazione Febbraio 2021

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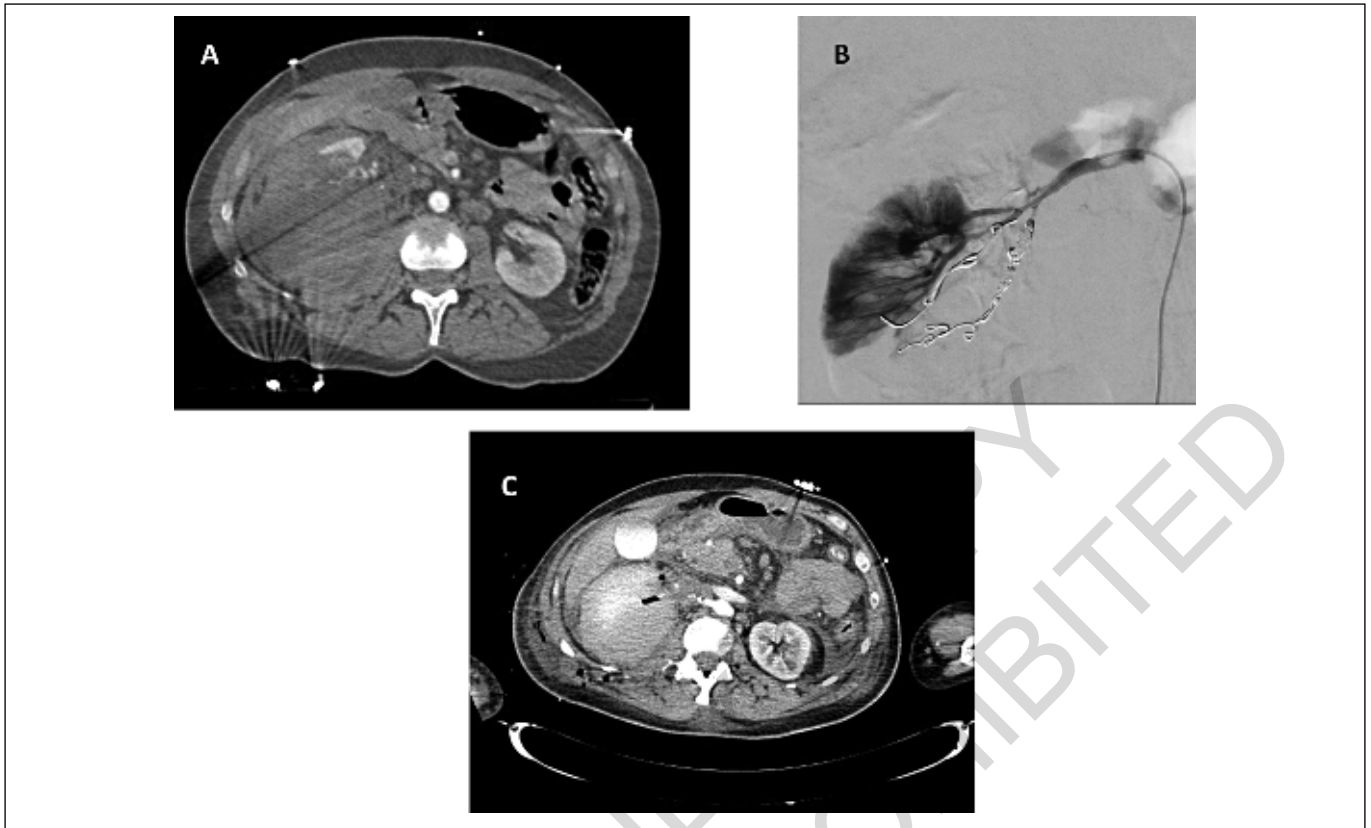


Fig. 1: A) CT scan showing active bleeding from the renal artery with perirenal hematoma. B) Control angiography after embolization of the renal artery. Half of the kidney is perfused by a polar renal artery. C) 7th day postoperative control CT scan showing a right perirenal abscess with air and perinephric fluid accumulation.

Postoperative course worsened after one week, because the patient suddenly presented fever up to 38,5 °C, hypotension (80/60 mmHg), an alteration of white blood cell count [17000/mm³ (n.v. 4 - 10)] and an increase of the C reactive protein [22 mg/dL (n.v. 0 - 0,5)]. An abdominal CT revealed the presence of a large right perirenal abscess (13 cm x 10 cm x 9 cm in diameter) with air and perinephric fluid accumulation (Fig. 1C). The patient was then emergently operated on and a right nephrectomy was performed. Postoperative course was uneventful, and she was discharge after 10 days. At 9-month she is alive, and in good physical conditions.

Discussion

Similarly, to other abdominal organs⁵⁻¹⁰, we strongly support the indication that most high grade blunt renal injuries should be treated nonoperatively, because of the significant decrease in the incidence of overall morbidity and mortality¹¹⁻¹³. This trend toward NOM for patients with high grade blunt trauma is presently also supported by the better outcome linked to the use of minimally invasive angioradiological tools¹⁴. Lanchon et al.¹⁵ reported that in 149 patients affected with grade

IV or V renal blunt trauma, NOM was successful in 82%, with higher success in patients with grade IV as compared to grade V (89% *versus* 52%). Predictors for NOM failure were higher grade and hemodynamic instability. Similarly, McGuire et al.¹⁶ in a series of 117 patients affected with grade III-V renal trauma reported that a total of 83% were treated with NOM and 9.3% (9/97) with angioembolization (8 cases) and nephrectomy (1 case). Predictors for intervention were grade V [relative risk (RR) 4.4] and use of platelets (RR 8.9). Van der Wilden et al.¹⁷ demonstrated that 77% (154/201) of patients with grade IV or V blunt renal trauma were successfully treated with the NOM and no nephrectomies were recorded. Age over 55 years and the motorcycle accident were the only predictors for failure. In a recent metanalysis¹¹, we demonstrated that NOM is indicated in high grade (III to V) penetrating or blunt renal trauma because mortality is significantly lower. Synthetically, present data run all towards the same direction, NOM should be the first line approach in all renal trauma, of course whenever is possible, reserving the surgical treatment to a selected group of patients.

We critically revised our approach to this specific patient. The decision to a NOM was corrected because our main drive is always decreasing the morbidity, mortality and

preserving the function of the affected organ, even more, in this case, in whom, the kidney was perfused by an inferior polar artery with apparently no lesions of the renal pelvis. Therefore, a question arises: can surgeons select patients in whom NOM might fail? This is a very difficult answer, but we believe that the subgroup of hemodynamically stable patients in whom the simultaneous presence of renal pelvis and vascular lesions is noted, should be approached with a NOM. However, this conservative approach might be risky and necessitate to a prompt modification of the treatment planning because the presence of blood and urine collection in the area of trauma can determine a superinfection, as it happened in the present case. However, in these specific cases, we still have the possibility to preserve an organ with a percutaneous drainage according to the patients' conditions. Conversely, in our case an emergent nephrectomy was deemed necessary because of the critical condition of the patient due to a superinfection.

In conclusion, an initial conservative management of high grade blunt renal trauma (III to V) is effective and recommended for the majority of hemodynamically stable patients, but the risk of failure is always present and, therefore, further clinical studies and metanalyses are needed to eventually select patients at high risk of NOM failure. However, since the NOM might fail the surgical team should be always prompted to change their previous strategy.

Riassunto

Riportiamo il caso di una paziente che giunge alla nostra osservazione dopo un incidente stradale moto- auto, riportando una lesione di IV grado del rene nella quale è stato tentato con insuccesso il trattamento conservativo. Abbiamo, quindi, discusso la possibilità al momento del ricovero di selezionare un sottogruppo di pazienti affetti da trauma renale di alto grado nei quali potrebbe fallire il trattamento conservativo.

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