



Original Article

Subject: Surgery

Nephrectomies for abdominal trauma in a Second Level General Hospital: Number of cases.

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Abbreviations

AAPCC; American Association of Poison Control Centers, ARDS; Acute respiratory distress syndrome, CCBs; Calcium channel blockers, CRRT; Continuous Renal Replacement Therapies, e.g.; for example, ILE; Intravenous lipid emulsion, LA; Local anesthetics, ml/kg; milligram per kilogram, RISK: Reperfusion Injury Salvage Kinase, ROS; Reactive oxygen species, ROSC; Return of spontaneous circulation, TCA; Tricyclic antidepressants, US; United States, USA; United States of America.

Summary

Introduction: Genitourinary trauma is 10% and from 5 to 10% of all cases of trauma they are kidney.

Material and Method: To assess the incidence, etiology, clinical characteristics and morbidity of nephrectomies due to open and closed abdominal trauma in a population of southeastern Mexico, an observational, retrospective and cross-sectional study was conducted over a period of 5.5 years (2013-2018) in a general hospital. where all patients who were admitted to the shock or emergency department with a diagnosis of abdominal trauma were included, there were no exclusion criteria.

Results: During the study period there were 38 cases with abdominal trauma, where there were only 4 cases of renal trauma; two male and two female; two cases for open trauma and two cases for closed trauma; one caused by a gunshot wound, one by a knife, one by a motorcycle crash and one by ship keel trauma. Three entered stable hemodynamically and one unstable.

Discussion: McPhee reminds us that renal trauma rarely requires emergency nephrectomy since grades I and II can be treated conservatively, grades III and IV with angioembolization. In their study they did not have any grade V lesions but obviously these cases require nephrectomy. On the other hand, in our environment renal lesions are rare, the right kidney was the most affected in this review, mortality was 25% although the injury causing the death was liver trauma.

Introduction

Greenwood [1] tells us that in urology hematuria is present in almost 90% of the kidney lesions but if it is absent it could be due to injury of the ureter or obstruction by clots in such a way that he treated a patient without hematuria by division of the artery as a single injury.

The abdominal trauma occurs by itself in approximately 3% of all cases of trauma, although in cases of abdominal trauma with multiple organ injuries it reaches 8 to 10%. And the frequency of genitourinary trauma is 10% and from 5 to 10% of all cases of trauma, these are renal. [2, 3]

Kindall since 1938 already handled the idea that renal trauma injuries could be treated without surgery as demonstrated in 10 cases presented at a congress. [4]

The best imaging study for the diagnosis of these lesions is the contrasting CT combined with a strict observation of the patient and modern intravascular techniques, such that only 2% of cases of renal trauma require surgery, of which 11% require of

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nephrectomy. [5, 6]

Material and Method

To assess the incidence, etiology, clinical characteristics and morbidity of nephrectomies due to open and closed abdominal trauma in a population of southeastern Mexico, an observational, retrospective and cross-sectional study was conducted over a period of 5.5 years (2013-2018) in a general hospital. where all patients who were admitted to the shock or emergency department with a diagnosis of abdominal trauma were included, there were no exclusion criteria.

The demographic variables were obtained: age and sex; etiology; Laboratory tests: group and Rh, Hemoglobin, arterial blood gases; Cabinet studies: (US, TAC), admission to ICU, intrahospital stay and morbidity. For the statistical analysis descriptive statistics were used, the qualitative variables were expressed in percentages; and the quantitative variables in means, medians and standard deviation.

Results

During the study period of 38 cases (100) with abdominal trauma, there were only 4 cases of renal trauma (1.5%), two male and two female; two cases for open trauma and two cases for closed abdominal trauma; one caused by a gunshot wound, one by a knife, one by a motorcycle crash and one by ship keel trauma. Three entered stable hemodynamically and one unstable.

Case 1: Masculine of 26 years of age who brought him in an ambulance due to falling motorcycle, upon his arrival he reported intense pain in the lumbar region, abdomen and lower extremities, vital signs of admission Pulse 120 / min, TA 144 90 mmhg, temp 37.5 0C, and 16 breaths/min; Laboratory Hb 10.8 g/dl, Hto. 33.2%, BUN 12.94 mg/dl, serum Urea 27.69, creatinine 0.45 mg/dl, DHL 296 U/ml. CT with perirenal hematoma. Diagnosis: Closed abdomen trauma + GII splenic lesion and left kidney injury Grade I, Renal exploration.

Case 2: Female 14 years old with a knife wound in the posterior region of the right flank. Pulse 120 / min, Temp. 36oC, breathing 27 / min. TA without assessing. CT subcapsular hematoma of the right kidney and US with intra-abdominal free fluid. Hb Laboratory 11, Hto. 34, normal rest .. Drainage treatment of right gerota hematoma.

Case 3: A 15-year-old female suffers abdominal trauma due to a gunshot in the right hypochondrium at her home by a third person. Entry laboratories Hb 11.1, Hto. 33.4, normal rest. Positive ultrasound, To the surgical intervention right renal lesion GII, Gastric lesion GIII with duodenal lesion in mirror GIII, making corresponding raffia.

Case 4: A 54-year-old male who suffers abdominal trauma in the sea by a quilla from a marine boat on the right flank when swimming. At his admission patient in a state of shock that is admitted directly to the operating room, performing exploratory laparotomy, locating grade V hepatic injury and Grade III renal injury. Raffia is performed in the patient, packaged, nephrectomy is performed, and the patient is admitted to Intensive Therapy where the patient dies.

The statistical data are presented in table 1 and the injured organs and their treatment in table 2.

Table 1. Statistical values for age, hemoglobin and days of intrahospital stay.

Values	Age (years)	Hemoglobin (mg/dl)	EIH (Days)*
Average	27	10	6.5
Median	20	11	7
Mode	14	11	N/A
SD	19	3.4	4.4
Rank	40	7.8	10
Minimum	14	5.1	1
Máximum	54	13	11

*EIH = Hospital stay

Table 2. Injured organs and their treatment.

	Órganos lesionados	Treatment
1	Left kidney; Spleen Grade III	Raffia; Splenectomy
2	Right kidney Grade II	Raffia
3	Right kidney Grade II; Stomach; Duodenum;	Raffia
4	Right kidney Grade III, Lesión hepática grado V	Packaging, nephrectomy

Discussion

Not all closed abdominal traumas cause obvious anatomical renal damage, however, renal function may be compromised as in the case of Joshi M, et al., [7] where they report a case of transient renal hypoperfusion detected by CT a week after Closed abdominal trauma with satisfactory medical resolution.

Chang YR, et al., [8] report a case of acute abdomen due to closed trauma in which they located a kidney in the intraperitoneal position which had to be sacrificed because it had an IV classification according to the rare case AAST but which can be found when laparotomized a patient in critical condition.

Keihani, et al., [9] report that urinary extravasation following a high-impact kidney injury is 29% for grades III and IV and 51% for IV and V injuries and 74% for grade IV injuries. For this type of lesion that is not necessarily parenchymal, renal or vascular pelvic lacerations, the rate of stents placed was 29%, which is the treatment of choice in cases of urinary extravasation.

Similarly, Erlich, [10] in his study, reached the consensus that the current management of renal injuries due to trauma should be treated by angioembolization in cases of active hemorrhage and endourological stents in cases of urinary extravasation, although it should be taken into account that interventional radiologists and urologists are not always available 24 hours a day and the general surgeon will have to face these situations.

McPhee [11] reminds us that renal trauma rarely requires emergency nephrectomy since grades I and II can be treated conservatively, grades III and IV with angioembolization. In their study they did not have any grade V lesions but obviously these cases require nephrectomy.

Keihani, et al., [12] consider that the current treatment is expectant and conservative in about 80% of the cases of major renal lesions; however, there is a high number of nephrectomies due to clinical factors of the patients as the substitutes used for hemodynamic instability and metabolic acidosis are associated with this radical procedure in such a way that the penetrating wounds of the abdomen and the severe lesions of IV and V are strong predictors of nephrectomy.

On the other hand, Bjurlin, et al., [13] found that nephrectomies have decreased in their environment and that the results of patients in staggered hospitals as well as in patients transferred to other hospitals are similar.

Also this same author [14] recognizes that the non-operative handling has a failure in the first 24 hours of 2.7%. The extent of renal injury, non-renal abdominal injuries, and penetrating wounds are predictors of failure in conservative management. In our series there were 3 cases with additional injuries that required corresponding repair.

But other authors, such as van der Wilden, [15] claim that hemodynamically stable patients with grade IV and grade V injuries were successfully treated conservatively with a 6.5% failure and that $\frac{3}{4}$ parts of the patients treated managed to save their kidneys. Similarly, Hampson [16] tells us that with respect to in-hospital stay, there is no difference in the stay whether managed conservatively or surgically.

Race [17] states that even in penetrating renal injuries, non-operative management is possible with the support of the CT scan to determine the degree of the injury regardless of the degree of the injury. Similarly, Zemp [18] states that the size of the renal hematoma is independently associated with the need for urological intervention.

Conclusions

In our environment, renal lesions are rare, the right kidney was the most affected in this review, mortality was 25% although the injury causing the death was liver trauma.

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Author Contributions

This is to declare that Dr. Guillermo Padrón Arredondo is the only author.

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