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Review Article

A 5 YEAR RETROSPECTIVE REVIEW OF PATIENTS WITH RENAL TRAUMA: A SINGLE CENTRE STUDY.

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Abstract:

Background

Operative and non-operative approaches are the management options for renal trauma based on the clinical profile of the patient. This study evaluated the clinico-radiological profile of renal trauma patients (Grades I-V) and their management to determine the association of grade of renal trauma with length of hospital stay and type of treatment.

Materials and Methods

This retrospective cohort study was conducted in the Department of Urology, JSS Hospital, Mysuru, from January 2019 to January 2024 on patients with confirmed renal trauma on computed tomography.

Results

A total of 48 patients with renal trauma were included in this study. The mean age was 34 years, and the majority of the patients were males (83%). Blunt trauma was most frequently reported, and only 10% patients required surgical exploration. The distribution of patients according to grades of renal trauma was (27.1%) Grade 1;(14.6%) Grade II; (37.5 %), Grade III; (16.7 %) Grade IV; and (4.2 %) Grade V. Liver injury was the most common associated injury, followed by rib fractures and DJ stenting (12.5%) was the commonly performed surgical intervention. The mean length of hospital stay ranged from 04 to 60 days, positively correlated with the severity of grades. Microscopic hematuria was the most common presentation, with death occurring in only 3 patients of Grade V injury.

Conclusion

Conservative management is the preferred choice in the majority of renal trauma cases. This study has shown high renal preservation in low-grade (I-III) renal injuries, which were managed conservatively. However, surgical intervention in high-grade (IV, V) hemodynamically unstable patients was still a need.

***Keywords**: Operative, non-operative, renal injury scale, low and high grade.*
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Introduction

Despite both kidneys being well protected by the strong lumbar muscles, vertebrae, ribs, and abdominal viscera on the anterior side, the kidneys, being the genitourinary organs, are most often to be traumatized. [1]

Worldwide, the annual incidence of renal trauma accounts for approximately 2,45,000 cases. Renal injury contributes 24% of abdominal solid organ injury and is the third most commonly injured organ due to abdominal trauma, following the liver and spleen. [2]

There are two types of renal trauma. Blunt renal injuries (80-95%) due to motor vehicle accidents, falls from height, and contact sports. 2) Penetrating renal injuries are mainly caused by firearms, gunshot wounds, and stab wounds. [3]

American Association for the Surgery of Trauma (AAST) from grades I-V, is the most common grading system employed for renal trauma [4]

There is a paradigm shift from an operative to a conservative approach in the management of renal trauma over the last few decades [5].

As there are very limited data on Indian patients available, this study aimed to evaluate the clinic-radiological profile

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of renal trauma patients and their management to determine the optimal approach among Indian patients.

Materials and methods

Study Design

A Retrospective Cohort Study.

Study Setting

A retrospective observational study was conducted in the Department of Urology, JSS Academy of Higher Education and Research (AHER), Jagadguru Sri Shivarathreeshwara (JSS) Hospital, Mysuru, from January 2019 to January 2024 after taking clearance from the IEC.

Study Participants

48 patients were enrolled in the study.

Inclusion criteria

All the study patients above 18 years of age who underwent computed tomography for the identification and grading of renal injury.

According to the American Association for the Surgery of Trauma organ injury scale, Renal injury was graded from Grade I to V.

Exclusion criteria

1. Age less than 18 years.
2. Patients who were not willing to give consent

Bias

No obvious bias noted in the study.

Data collection

The electronic records of the hospital were analysed by describing data on patients who experienced renal trauma with ICD-10 code S-37.0 in our hospital.

The detailed medical history and demographic details (age, sex, length of stay, grades of renal injury, type of treatment, side of involvement, and associated injuries) were collected for each patient.

Statistical Analysis

Statistical analysis was performed using Statistical Package for the Social Sciences version 24.0. Analyses of categorical variables using the Chi-squared test and quantitative variables using ANOVA were conducted.

Multiple linear regression analysis was used to find variation in age, gender, type of management, and associated injuries. $P<0.05$ was considered statistically significant.

Ethical Consideration

Institutional Ethics Committee, JSS Medical College has approved the study.

Results

A total of 48 patients with renal trauma were enrolled in the study. In the patients with renal trauma, the mean (standard deviation) age was 34 with 40 Men (83%) and 08 Women (17%).

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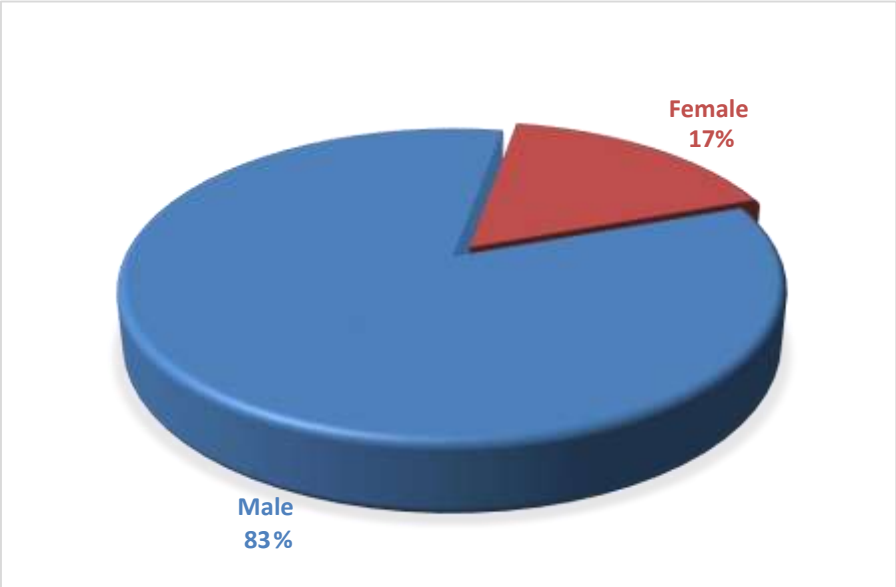
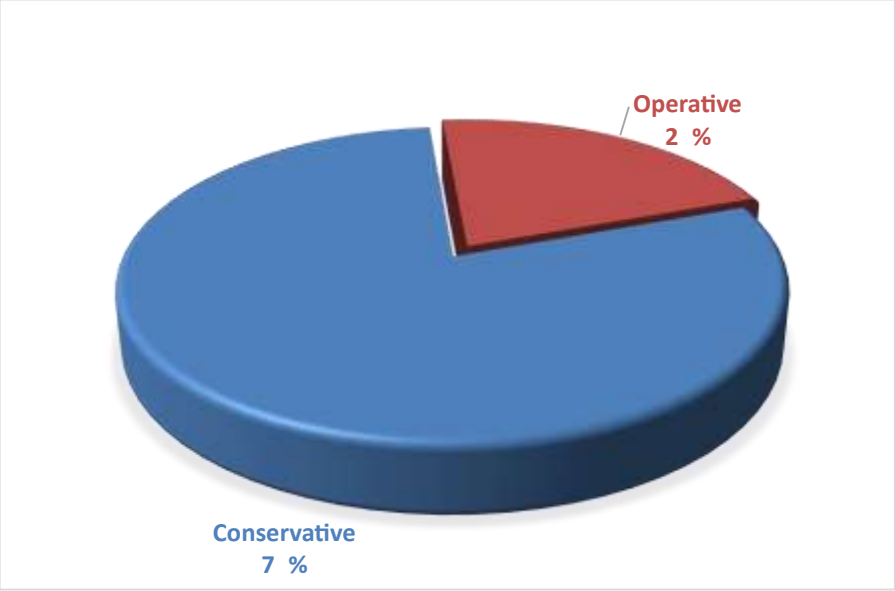


The majority of patients (n= 38, 79.2 %) with renal trauma were managed conservatively and only 10 Patients (20.8 %) were managed surgically.



The mean (SD) hospital stay was 12 Days. 58.3% patients had injury on the right side and (37.5%) on the left side and (4.2 %) patients had bilateral renal injury.

The distribution of patients based on AAST classification of renal trauma was (27.1%) Grade 1;(14.6%) Grade II; (37.5 %), Grade III; (16.7 %) Grade IV; and (4.2 %) Grade V.

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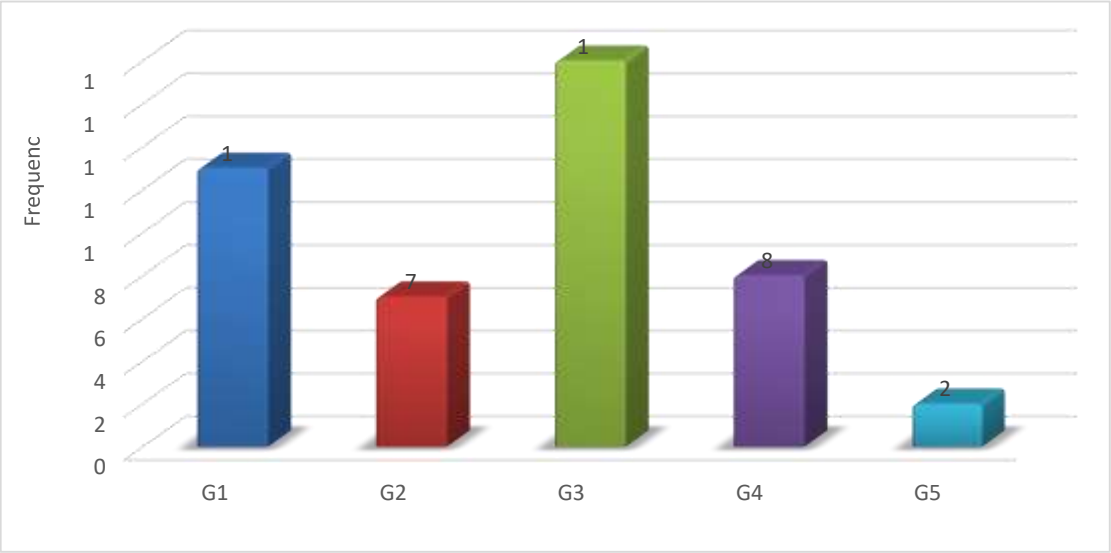
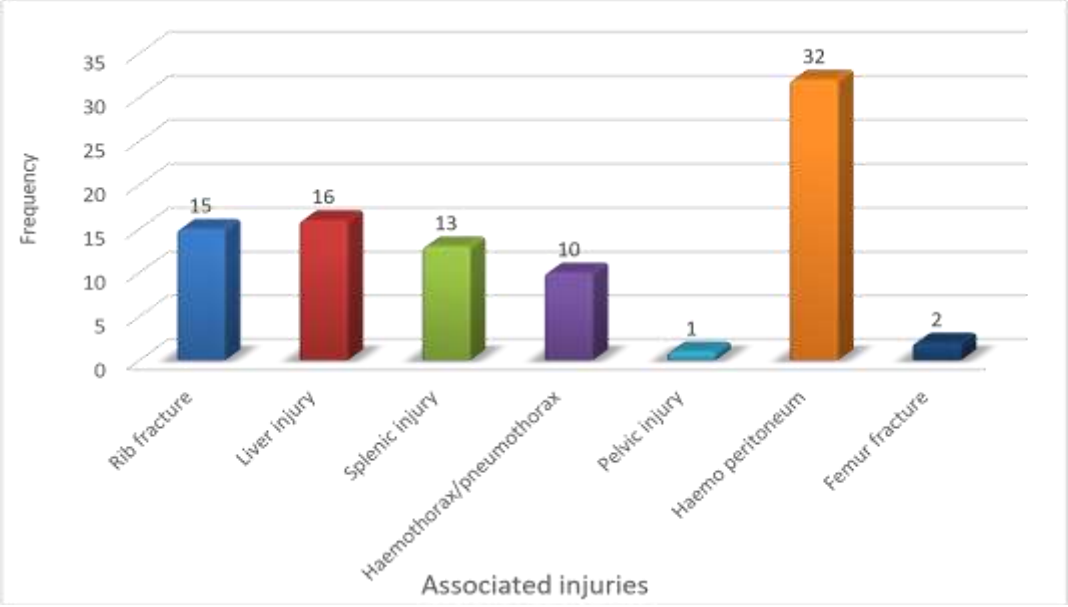


The most commonly associated injuries were rib fracture in (31.3 %) patients, liver injury in (33.3%) patients, haemothorax in (20.8 %), splenic injury in (27.1%), hemoperitoneum in (66.7%), femur fracture in (4.2%). However, 5 patients had no injuries.



Overall, 20.8 % of the patients (n =10) required surgical intervention for renal trauma: retrograde pyelography (3%), DJ stent (12.5%), percutaneous drain (2.1%), open drainage (4.2%), ultrasound-guided aspiration (2.1%), and nephrectomy (6.3%).

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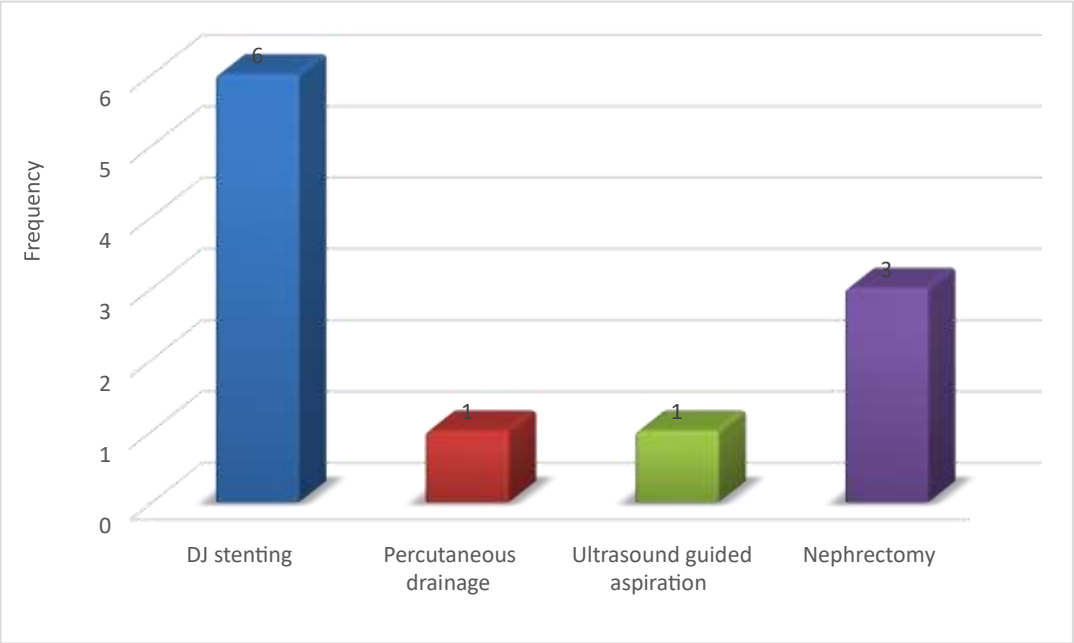

The mean length of hospital stay ranged from 04 to 60 days and showed an increasing trend with severity of grades from Grade I to Grade V.

Mean length of hospital stay was 5,8,14,18, and 30 days for patients with Grade I, II, III, IV, and V renal trauma, respectively.

The majority of the patients were men (04,09,11,12,04) with Grade I, II, III, IV, and V renal trauma, respectively.

In patients with Grades I and II, the majority had unilateral renal injury (n = 20, 41%, and n = 26, 54.5%, respectively) and only two patients had bilateral renal injury (n = 2, 4.2%).

The clinical presentation of the patients showed- n=10(20.8%) had microscopic haematuria, n=15(31.3%) had gross hematuria without shock, n=12 (25%) had local signs and symptoms, and n=11(22.9%) had gross hematuria with shock.

03(6.3%) deaths were reported in the study population. All 3 deaths were Grade 5 injuries.

The grade of renal trauma was positively correlated with length of hospital stay (r = 0.390, P = 0.003).

The type of treatment was not associated with the grade of renal injury, age, gender, side of renal involvement, or associated injuries.

There was no significant difference in age and length of hospital stay between different grades of renal trauma. Games–Howell post hoc analysis of ANOVA was used for multiple group comparison.

When patients with Grade I were compared with those with Grade IV, a statistically significant mean difference was observed in length of hospital stay (mean difference [SE] = −7.33 [3.1], P = 0.009).

In the regression model, age, sex, grade of renal trauma, type of treatment, side of renal injury, and associated injuries did not provide a good fit to explain variation in length of hospital stay (r = 0.438; r2 = 0.192; adjusted r2 = 0.095; P = 0.087).

Discussion

Since the last decade, management of renal trauma cases has displayed a drastic change from a surgical approach to a conservative one, which includes nonoperative methods.

Key Results

The present study attempted to evaluate the clinic radiological profile of renal trauma patients (Grades I–V) and their management to determine the optimal management approach among Indian patients.

In the present study, the mean age was 34.33 years, and the majority of the patients were men. These observations corroborate the previous studies showing the incidence of renal trauma being most prevalent in men from the age group of 18-50 years.

The most common approach used in this study for the management of renal trauma was the conservative one

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(79.2%), with the majority of the patients having unilateral injury (96.70%).

The distribution of patients according to grades of renal trauma was comparable from Grade I to Grade IV, and the number of patients with Grade V was the lowest.

A systematic review of 605 articles reported that, of the 10,935 renal trauma patients, the distribution of renal injuries was Grade I (26%), Grade II (28%), Grade III (20%), and Grade IV.

(19%), and Grade V (7%). These observations are in agreement with the present study.

Previous studies have reported management of renal trauma with a nonoperative approach in 84% - 95% of the patients, with 2.7%–5.4% of the patients reporting failure.

In a study by Ząbkowski et al., most of the cases were treated with a conservative approach and had good outcomes for the 27 cases of Grade I and Grade II trauma.[6]

They were unable to successfully manage and treat Grade III and Grade IV injuries conservatively, except for 1 out of 10 Grade III injuries and 1 out of 4 Grade IV injuries.[6]

The present study reported 10 (20.8%) patients who required surgical interventions for renal trauma. These include retrograde pyelography (3.0%), DJ stent (12.5%), percutaneous drain (2.1%), open drainage (4.2%), ultrasound-guided aspiration (2.1%), and nephrectomy (6.30%).

A study by Bjurlin et al. reported that only 16.6% of the renal traumas were managed surgically, whereas 83.4% were managed nonoperatively. Nephrectomy (42.4%) and angiography and angioembolization (31.7%) were the most common surgical interventions used.[7]

In the present study, the overall length of hospital stay ranged from 04-60 days and showed an increasing trend with severity of grades from Grade I to Grade V.

Therefore, patients with Grade IV and Grade V renal trauma require a longer duration of hospital stay for better management of the injury.

A study by Lanchon et al. reported 25 days and 12 days of hospital stay for surgically managed and conservatively managed renal trauma patients, respectively, suggesting that significantly longer duration of hospital stay is required for surgically managed patients.[7]

The likelihood of nonoperative management failure increased with increasing renal grade injury where Grade III (odds ratio [OR], 1.94; 95% confidence interval [CI], 1.35–2.90), Grade IV (OR, 9.79; 95% CI, 7.04–13.63), and Grade V (OR, 9.45; 95% CI, 6.02–14.86) renal injuries were associated with a statistically significantly increased likelihood of nonoperative failure compared with Grade I ($P < 0.001$).

The present study reported a positive association of renal trauma grade with length of hospital stay ($r = 0.390$, $P = 0.003$). These results support the longer duration of hospital stay required for patients with a higher grade in this study and suggest that the severity of renal trauma is responsible for the long duration of hospital stay.

Interpretation

The present study's observations revealed that conservative treatment was the most commonly used approach for management of grades [I-IV] renal trauma. Grades of renal trauma and type of treatment are independent factors responsible for variation in length of hospital stay among Indian patients.

Generalizability

These findings can be applied to institutions encountering renal trauma patients.

Limitations

The present study did not compare the outcomes of conservative and surgical approaches. This study would be more valuable if conducted as a prospective cohort study with follow-up surveillance.

Recommendations

No recommendations

Acknowledgement

No acknowledgement

List of Abbreviations

No list of Abbreviations

Source of Funding

No source of funding.

Author contribution

- **Dr**. Amruthraj Gowda, Professor and Head, Urology department, has contributed to the overall coordination of case collection, reporting, and processing for the study.
- **Dr**. Vijayakumar. R, Associate Professor, Urology department, has contributed to the decision-making on the medical and surgical approach to the study participants.
- **Dr**. Sachin Dharwadkar, Associate Professor, Urology department, has contributed to the data collection, literature review, and statistical analysis of the study subjects.
- **Dr**. Ravikumar. B.R, Associate Professor, Urology department, has also contributed to the decision-making

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on the medical and surgical approach to the study participants.
- **Dr**. Abdul Khader Mashook, Senior resident, Urology department, has contributed to the publication process of this study.
- **Dr**. Sajan Sehgal, Senior resident, Urology department, has contributed to the publication process of this study.

Data availability

Hospital and Electronic records.

Author Biography

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REFERENCES

1. Alonso RC, Nacenta SB, Martinez PD, Guerrero AS, Fuentes CG. Kidney in danger: CT findings of blunt and penetrating renal trauma. Radiographics 2009;29:2033-53. https://doi.org/10.1148/rg.297095071
2. Meng MV, Brandes SB, McAninch JW. Renal trauma: Indications and techniques for surgical exploration. World J Urol 1999;17:71-7. https://doi.org/10.1007/s003450050109
3. Santucci RA, McAninch JM. Grade IV renal injuries: Evaluation, treatment, and outcome. World J Surg 2001;25:1565-72. https://doi.org/10.1007/s00268-001-0151-Z
4. Lee YJ, Oh SN, Rha SE, Byun JY. Renal trauma. Radiol Clin North Am 2007;45:581-92, ix. https://doi.org/10.1016/j.rcl.2007.04.004
5. Broghammer JA, Fisher MB, Santucci RA. Conservative management of renal trauma: A review. Urology 2007;70:623-9. https://doi.org/10.1016/j.urology.2007.06.1085
6. Ząbkowski T, Skiba R, Saracyn M, Zieliński H. Analysis of renal trauma in adult patients: A 6-year experience of a trauma center. Urol J 2015;12:2276-9.
7. Bjurlin MA, Fantus RJ, Villines D. Comparison of nonoperative and surgical management of renal trauma: Can we predict when nonoperative management fails? J Trauma Acute Care Surg 2017;82:356-61 https://doi.org/10.1097/TA.0000000000001316
8. Lanchon C, Fiard G, Arnoux V, Descotes JL, Rambeaud JJ, Terrier N, et al. High-grade blunt renal trauma: Predictors of surgery and long-term outcomes of conservative management. A prospective single-center study. J Urol 2016;195:106-11. https://doi.org/10.1016/j.juro.2015.07.100

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