REVIEW ARTICLE

MANAGEMENT OF RENAL TRAUMA: OUR EXPERIENCE

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ABSTRACT: INTRODUCTION: The kidney is the most commonly injured genitourinary organ in 1-5% of all trauma patients. Blunt trauma is the most common mechanism of injury although penetrating injuries are becoming more common due to increasing violence. The management of patients with blunt abdominal injury has evolved greatly over the last few decades. Although renal trauma can be life threatening, most injuries can be managed conservatively. **AIMS AND OBJECTIVES:** To evaluate the efficacy, safety and outcome of the conservative management of renal trauma and to study the role of surgical management of renal trauma in the present era. **MATERIALS AND METHODS:** From January 2012 to December 2013 42 patients admitted to our department with renal trauma were analyzed. All the patients were initially managed by resuscitation. The diagnosis was made by physical examination, clinical findings supported by plain X-ray abdomen erect posture, ultrasound Abdomen, CECT Abdomen. Associated organ system injuries were addressed accordingly. Stabilized patients (grade I-III) were kept on conservative management. Some grade IV and all grade V cases were taken up for surgery. **RESULTS:** Highest incidence of renal trauma was observed in 2nd and 3rd decade of life. Youngest being 6 years old and eldest was 55 years old. 35 males and 7 females. Blunt injury in 38 cases, stab in 2, fall on to a rod - 1, gunshot-1. Majority presented with hematuria and flank pain. 27 presented with minor injuries requiring conservative management. 15 presented with grade V injuries. Out of which 3 responded to conservative management 12 required surgery. **CONCLUSION:** in patients with AAST Grade I, II, III conservative management proven to have good success rate and high renal salvage. In AAST -Grade IV with other abdominal injuries renal preservation strategies were effective & successful.

KEYWORDS: CONSERVATIVE, HEMATURIA, RENORRHAPHY.

INTRODUCTION: The kidney is the most commonly injured genitourinary organ in 1-5% of all trauma patients.^(1,2) Blunt trauma is the most common mechanism of injury although penetrating injuries are becoming more common due to increasing violence. The management of patients with blunt abdominal injury has evolved greatly over the last few decades. Although renal trauma can be life threatening, most injuries can be managed conservatively. During the past 20 years advances in radiographic imaging, improvements in hemodynamic monitoring, validated renal injury scoring systems allow successful non-operative management strategies for increased renal preservation. This is our experience with the management of renal trauma in 42 patients admitted to our department during the past 2 years.

MATERIALS AND METHODS: 42 patients were admitted to our department with renal trauma from January 2012 to December 2013. This was a prospective study. Iatrogenic renal injuries were excluded from the study. The details of each patient were recorded like age, sex, occupation, clinical presentation of symptoms, history of trauma, smoking, alcoholism, co-morbidities. In critically ill patients after resuscitation the details were taken as per the proforma. All were subjected to blood

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routines, ultrasound of abdomen, CECT abdomen, plain X-ray abdomen erect. Associated organ system injuries were addressed accordingly.

TREATMENT: AAST grade I- IV patients were treated on conservative lines. They included:

- Absolute bed rest till resolution of hematuria.
- Appropriate fluids and blood transfusion.
- Serial estimations of hematocrit.
- Prophylactic antibiotic coverage.
- Continuous monitoring of vitals, signs of progression of hemorrhage if any.

INDICATIONS FOR LAPAROTOMY:

- Hemodynamic instability after resuscitation.
- Penetrating injury with associated other organ injury.
- Delayed surgical management for selected cases.
- Selected AAST Grade IV and all grade V cases renal reconstruction included vascular control. Complete renal exposure, debridement of necrotic tissue, hemostasis by figure of eight suture, ligations of bleeding vessels and closure of parenchymal defect with horizontal mattress sutures. Perinephric drains kept till drain output comes down to <50 ml/day. Follow up evaluation included recording of BP, CUE, Serum creatinine, Ultrasound abdomen at 3-4 weeks, CECT Abdomen at 12 weeks, renal scan after 6 months in selected cases.

RESULTS: Total patients studied were 42. Of these 12 patients were in 2nd decade of life and 14 were in 3rd decade. 35 were males 7 were females 13 were children. Out of 42 patients 38 (90%) sustained blunt injury. 3(7%) stab wounds. This correlates with the other studies in literature showing blunt injury as the most common mode of renal trauma. Motor vehicle accidents in 24 (57%) cases were the common cause of blunt injury abdomen. Gross hematuria was the common mode of clinical presentation in 36 (85%) cases. Along with gross hematuria, flank pain was the presenting symptom in 30(70%) of 42 patients. In our study, 27(63%) patients presented with minor injuries (AAST Grade - I-III). In all these, renal preservation with conservative management was successful. 11 patients presented with grade IV injuries out of which 6 cases had isolated grade - IV renal injuries. Of these, 4 cases needed no intervention, 2 cases needed DJS/nephrostomy. Rest of 5 cases with grade IV renal injuries needed exploration due to significant nonviable renal parenchyma (>30%), urinary extravasation on CECT Abdomen in delayed films, and significant other abdominal organ injuries (2- lower pole nephrectomies with renorrhaphy, 3- renorrhaphy for interpolar laceration). 4 patients presented with grade V renal injuries all of which ended in nephrectomy (1- renal artery thrombosis, 1- stab injury, 2- shattered kidneys) other organ system injuries included lower rib fractures in 21 (50%) cases, liver lacerations in 12, splenic lacerations in 9. No significant complications except 2 cases developed febrile UTI, responded to antibiotics, 2 cases developed urinary leak from drain site, 1 case developed bleeding from drain site and prolonged hematuria. 2 cases developed persistent urinary extravasation responded to endoscopic management.

DISCUSSION: Renal injury is the commonest genitourinary cause of ER trauma admissions.

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AGE WISE DISTRIBUTION: In the present study, 61% patients belonged to 2nd & 3rd decades of life. Our study was comparable to study (R.S. Rai, S.K. Singh et al). Which showed 62% patients in 3rd & 4th decades of life.

SEX WISE DISTRIBUTION: In present series Male, Female ratio 5:1 which correlates with study. (Dekha et al; 2001), Male, Female ratio was 6:1 (R. S. Rai and S.K. Singh et al 2004, 4:1).

MODE OF INJURY: Present study shows blunt trauma major mode of injury in 90% cases which correlates with study (Salimi et al 96%). Blunt renal trauma in Europe, Canada and Rural Turkey are 97%, 93% and 31% respectively.

CLINICAL PRESENTATION: Present study shows hematuria, flank pain and associated organ injuries in 85%, 71% and 80% of patients respectively. This correlates with study. (R.S.Rai et al 89.5%,85.4% and 70% respectively).

MANAGEMENT: Conservative management is the treatment of choice for majority of patients with renal trauma. It has low failure rate (1%) and may ultimately save kidneys and reduce the number of renal units that might otherwise be lost iatrogenically during attempted repair.⁽³⁾ Even patients with urinary extravasation and solitary injuries can be managed expectantly with a resolution rate of >90%.⁽⁴⁾ Segmental arterial injury can be managed non-operatively with good results.⁽⁵⁾ The two absolute indication for surgery in renal trauma are life threatening renal hemorrhage with hemodynamic instability or expanding or pulsatile perirenal hematoma identified intra-operatively.^(6,7)

Conservative management was successful in 70% of patients in our study. This is comparable to that of R. S. Rai et al (75%) and P. M. Dekha et al (86.6%). In current series nephrectomy was done for vascular injury, major renal lacerations with significant nonviable parenchyma with urinary extravasation. These indications correlated with study by Mendez et al.

CONCLUSIONS:

- In patients with AAST grade - I - III renal injury non-operative management has good success rate, high renal salvage, low morbidity and minimal complications.
- Even in the presence of indication for exploration for other severe associated injuries in patients with AAST grade I-III renal injury, conservative strategy is simple, safe and effective
- Patients with isolated AAST grade IV renal injuries can also be managed conservatively if hemodynamically stable.
- Patients with AAST grade - IV renal injuries in the presence of associated other abdominal injuries with necessary indication for laparotomy may need renal exploration. These patients can also be managed with renal preservation strategies (Renorrhaphy, polar nephrectomy) with safe, effective and successful long term outcomes with minimal post-operative complications which are amenable for endoscopic interventions (DJS/ nephrectomy).
- In present era, in our study, nephrectomy is indicated for shattered kidneys with urinary extravasation, renal hilar injuries with delayed presentation not amenable for repair.

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REFERENCES:

1. Baverstock R. Simons R and MC Loughlin M. Severe blunt renal trauma; a 7 year retrospective review from a provincial trauma centre Can J. Urol.8, 1372-1376 (2001).
2. Meng. M. V. Brandes, S. B and Mc Aninch J. W Renal trauma indications and techniques for surgical exploration world J. urol 17,71-n(1999).
3. Hurtuk M Reed R.L 2nd, Eposito, T.J. Davis KA and Luchette. F.A. Trauma surgeons practice what they preach; The NTDB story on solid organ injury management. J. Trauma 61,243-254 (2006).
4. Alsikafi N.F. M.C Aninch. J.W. Elliott, S.P and Garcia. M. Non operative management outcomes of isolated urinary extravasation following renal lacerations due to external trauma J. Urol. 176.61.2494-2497 (2006).
5. Elliott, S.P. dweny, E.O and Mc Aninch, J.W. Renal 59 arterial injuries; a single centre analysis of management strategies and outcomes J. Urol. 178, 2451-2455 (2007) 60.
6. Amenakas, N.A Duckett, CP and Mc Aninch, J.W indications for non-operative management of renal stab wounds J.Urol.161.768-771(1999).
7. MC. Aninch, J.W Carroll P.R. Klosteman,. P.W. Dixon C.M. and Greenblatt, M.N. Renal 45, reconstruction after injury J. Urol 145. 932-937(1991).

ABBREVIATIONS:

AAST: AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA.

DJS: DOUBLE J. STENTING.

Figure 1

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Figure 2

Figure 3

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