MANAGEMENT OF BLUNT RENAL TRAUMA

BASED ON AGGRESSIVE INVESTIGATION &
CONSERVATIVE MANAGEMENT

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BLUNT RENAL TRAUMA

AETIOLOGY

- DIRECT - MVA (seat belts), fall, blows, kicks
- INDIRECT - falls on feet or buttocks

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BLUNT RENAL TRAUMA
CLASSIFICATION

MINOR (85%)
Contusions
Superficial lacerations (capsule & pelvicalyceal system intact)

MAJOR (10%)
Deep lacerations (capsular tears or pelvicalyceal involvement or both)

CRITICAL (5%)
Renal fragmentation
Pedicle injuries (renal artery thrombosis, vessel avulsion & pelviureteric rupture)

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BLUNT RENAL TRAUMA

SIGNS & SYMPTOMS

- Haematuria
- CLOT colic - pain
- Superficial LOIN CONTUSION
- Loin pain & tenderness
- LOIN MASS (blood &/extravasated urine)
- SHOCK
- NO haematuria

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INDICATIONS FOR IVP

- ALL PAEDIATRIC PATIENTS (<16 YEARS) WITH ANY DEGREE OF HAEMATURIA REGARDLESS OF MECHANISM OF INJURY.

- ADULTS WITH A CLINICAL INDICATOR OF FLANK TRAUMA, PRESENCE OF SHOCK (SYSTOLIC BP < 90mmHg) OR GROSS HAEMATURIA.

- ADULTS WITH MICROSCOPIC HAEMATURIA, STABLE BP (>90 mmHg) AND NO CLINICAL INDICATOR OF FLANK TRAUMA NEED NOT UNDERGO RADIOGRAPHY.

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BLUNT RENAL TRAUMA

FINDINGS ON IVP

- CONTROL FILM
  - Fractures of lower ribs & TP of L. vertebrae
  - Scoliosis concave to injured side
  - Loss of psoas shadow
  - Loss of renal outline
  - Loin mass (displacement of bowel or diaphragm)

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BLUNT RENAL TRAUMA

POST CONTRAST SERIES

- Delayed excretion on injured side
- Filling defects in Pelvis/Calyces-clots
- Distortion of calyces/renal pelvis-haematomas
- “Absent” calyx
- Elongation of renal shadow - transverse rupture
- Perirenal soft tissue mass - blood/urine
- Intra-renal &/extra-renal extravasation of dye

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BLUNT RENAL TRAUMA

POST CONTRAST SERIES

“A NON FUNCTIONING KIDNEY” on side of injury due to

- Renal Artery Trauma
- Clots in Renal Pelvis/Ureter

Cystoscopy & RGP may be required.

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BLUNT RENAL TRAUMA

PARAMETERS THAT GUIDE NEED FOR XRAY IMAGING

1. CLINICAL INDICATORS OF FLANK TRAUMA.
   Direct blow to flank, assoc intra-abdominal injuries or a deceleration injury.
   Signs of flank trauma i.e. contusions, seat-belt marks, lower rib #’s or #’s of lumbar transverse processes.

2. INITIAL BLOOD PRESSURE.

3. PRESENCE OR ABSENCE OF GROSS HAEMATURIA.

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BLUNT RENAL TRAUMA
SELECTIVE RENAL ANGIOGRAPHY

1. INDICATIONS:
   - Non function on IVP - URGENT
   - Decreased function on IVP
   - Continuing haematuria

2. FINDINGS:
   - Main renal artery occlusion
   - Major renal branch occlusion
   - Site & extent of parenchymal lesion
   - Areas of ischaemia
   - Traumatic A-V fistula
   - Large pseudo aneurysm
   - Massive haematoma

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BLUNT RENAL TRAUMA

RADIOGRAPHIC STAGING

- CHOICE OF PARTICULAR IMAGING STUDY SHOULD BE COORDINATED WITH THE TRAUMA TEAM AND OFTEN DEPENDS ON THE CLINICAL SITUATION.

- 33-60% OF IVP’S NOT ADEQUATE TO EXCLUDE MAJOR RENAL INJURY RELIABLY.

- CT SCANS ARE RELIABLE, NONINVASIVE, CAN DETECT ASSOC INTRA-ABDOMINAL INJURIES, ARE READILY AVAILABLE IN MAJOR TRAUMA CENTRES & CAN BE PERFORMED IN LESS THAN 1 HOUR.

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MANAGEMENT OF BLUNT RENAL TRAUMA

A. CONSERVATIVE MANAGEMENT

- Pertains to 85-90% of cases
- Strict Bed Rest
- Regular Clinical Examination:
  - Abdomen
  - Loin
  - Blood Pressure
  - Pulse
  - Urine aliquots
- Serial Haematocrit estimations
- Appropriate analgesia
- Prophylactic antibiotics
- Radiological Follow Up
- 3-6 Monthly B.P. checks for 5 years
- (1% develop Hypertension)

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B. OPERATIVE MANAGEMENT

1. URGENT OPERATION: Within hours of Injury
   To control excessive bleeding.
   To treat thrombosed renal artery.
   To treat assoc intraperitoneal injuries.

2. EARLY OPERATION: Between 3rd & 5th day
   To control bleeding not settling on conservative management.
   To prevent development of complications.

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COMPLICATIONS OF BLUNT RENAL TRAUMA

Can follow major renal trauma in 5-10% of cases if early surgery NOT DONE

- Secondary haemorrhage
- Para-renal pseudo-cyst (Urinoma)
- Hydronephrosis
- Pyelonephritis
- Calculi
- Hypertension

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MANAGEMENT OF BLUNT RENAL TRAUMA

OPERATIVE PROCEDURES WHICH MAY BE REQUIRED

- ARTERIAL INJURIES:
  - Thrombectomy
  - Segmental resection & reanastamosis
  - Autologous vein grafts

- NEPHRECTOMY:
  - “Floating” kidney
  - Infarcted kidney
  - Shattered kidney

- SUTURE OF MINOR TEARS.

- PARTIAL NEPHRECTOMY:
  - For MAJOR TEARS

S. BANDI, Mackay. Australia.
MANAGEMENT OF INJURIES TO THE URETER IN THE BONY PELVIS

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MANAGEMENT OF PELVIC URETERAL INJURY

FOUR MAJOR CONSIDERATIONS APPLY IN DECIDING MANAGEMENT

1. Site of Injury.
   i.e. middle or lower third.

   i.e. blunt trauma with avulsion or penetrating injury, when there is a high incidence of assoc organ injury.

   i.e. repair, proximal diversion + stenting for immediately recognised injuries. In contrast to drainage and diversion with later reconstruction in cases assoc with extensive abscess formation, urinoma and ureteral necrosis.


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MANAGEMENT OF INJURIES TO THE URETER IN THE BONY PELVIS

CAUSES OF INJURY:

Trauma:
- Blunt
- Penetrating

Iatrogenic:
- Gynaecological
- Urological
- Vascular
- Orthopaedic
- Colorectal

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MANAGEMENT OF INJURIES TO THE URETER IN BONY PELVIS

SURGICAL OPTIONS:

1. Ureteroureterostomy
2. Transureteroureterostomy
3. Renal Descensus & Nephropexy
4. Bladder Tube Flap - Boari
5. Psoas Hitch
6. Reimplantation to Bladder
7. Replacement by an Ileal Loop
8. Autotransplantation
9. Transplantation to Bowel or Skin
10. Nephrectomy

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Surgical Management of Renal Cell Carcinoma with IVC involvement

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Mr. G.H.

- 70 yr old male presents with left varicocele of 6-8 month duration associated with loss of weight and appetite.
- No haematuria, headaches, palpitations, fevers, shortness of breath or lower limb oedema or fatigue.
- Past history of anterior resection for rectal carcinoma, retinal detachment 1997 and bilateral cataract surgery.
- No allergies and not on any regular medication.
Mr. G.H.

- **U/S:** Lt varicocele and large Lt renal neoplasm
- **CT Scan:** Lt renal tumour with renal vein involvement and hilar and peri-aortic lymph adenopathy. Large collaterals in perinephric space.
- **Chest Xray:** NAD
- **Doppler U/S of IVC:** Tumour thrombus in left renal vein but not beyond the renal ostia into IVC.
- **Assistance Dr C F, ICU bed organised & Dr DF informed.**
Mr. G.H.

- Bowel prep with 2litre of Go-Lightly, IV hydration
- IV Rocephin and Gentamicin
- Chest physiotherapy
- TED stockings, S/C Heparin(in arm only) & Intermittent calf compression.
- Epidural + GA
- Chevron Incision
- Left Radical Nephrectomy and IVC repair
- Operating time 4.5 hrs
- Total operative blood loss was 1500 mls.
Mr. G.H.

- Given tea and toast 6 hrs post op
- Free fluids next day
- Normal diet D2 post op
- ICU for 48 hrs and then back to ward
- Drain removed D3 with IDC and IV therapy.
- Intensive chest physiotherapy continued until discharge on D6 post op.
- Half clips removed D6 and rest D12.
- Histology 11 cm RCC with left renal vein thrombus clear of margins, no venous wall invasion and no metastatic lymph nodes. Tumour extends past capsule into perinephric fat. Sarcomatoid tumour.
- Multiple PE bilateral with metastasis in brain and lung 11 weeks post op. RIP 2.10.99.
• Approximately 5% of patients with renal cell carcinoma have IVC involvement.

• 1% will have tumour thrombus extending to the right atrium.
CLASSIFICATION

- Level of thrombus does not impact on survival.
RCC with IVC Involvement
January 1994 - August 1999

- Type 1  3
- Type 2  5
- Type 3  1
- Type 4  1

Left RCC 6
Right RCC 4
LEVEL OF THROMBUS DOES NOT IMPACT ON SURVIVAL

Poor Prognostic Factors include

- Lymph node metastasis
- Caval wall invasion
- Incomplete removal of thrombus
RCC With IVC Involvement

**Signs & Symptoms**

- Haematuria 8 80%
- Flank pain 7 70%
- Mass 6 60%
- Fever 1 10%
- Anaemia 2 20%
- Weight loss 4 40%
- Fatigue 2 20%
- Dyspnoea 2 20%
- Leg oedema 2 20%
- Varicocele 6 60%
Summary of data on patients with RCC and IVC Involvement

Level 1

- Intra-operative deaths Nil
- Peri-operative deaths Nil
- Alive (NED) 1 (Mean 38mths) 1 aged 90 (DOO 30.5.96)
- Alive with metastasis 1 Developed DVT and Pulmonary metastasis 3.5 Months after surgery.
- RIP 11 weeks post op with bilateral pulmonary metastasis and brain metastasis 1.
Summary of Patients with RCC and IVC involvement

Level 2

- Intra-operative deaths Nil
- Peri-operative deaths Nil
- Alive (NED) 4 Mean 28 months
- Alive with metastatic disease 1 (Metastasis after 8 months) DOO 9/97
Summary of Patients With RCC and IVC Involvement

- Intra-operative deaths Nil
- Peri-operative deaths 1 PE D4 Post OP
- PM showed tumour embolus of main pulmonary artery also had a few tumour emboli in brain.
Summary of Patients with RCC and IVC Involvement

Level 4

- Intra-operative deaths Nil
- Peri-operative deaths Nil
- Alive (NED) 1
  Mean 63 months
  (DOO 5/94)
UROPATHOLOGY AUG 2000

Dr. S. Bandi & Dr. P. Fitzpatrick

- Case 1  Mr A D
- Case 2  Mr J K
- Case 3  Mr W S
- Case 4  Mr P Z
Mr. A D

- 67 yr old NIDDM with vague abdominal pain & epigastric discomfort
- Abdominal U/S Lt lower pole mass, solid in echotexture
- CT scan Exophytic solid renal tumour 3.8cm x 2.6cm x 3.1cm. No IVC involvement. No lymphadenopathy.
- CXR NAD
- Decision Lt Radical Nephrectomy or Partial Nephrectomy.
- Blood tests Creatinine 0.11 at presentation but has been 0.14 when DM inadequately controlled in past 2 years suggesting diabetic glomerulosclerosis.
Mr A D

- Clear fluid 3/7, Go lightly 2L 24 hrs preop, IV hydration, TED stockings, S/C Heparin (in arm only), Intermittent calf compression, Epidural/GA, Rt loin position, Lt 12th rib extraperitoneal approach

- 3cm lower pole tumour with satellite lesion close by. Decision therefore to perform Lt Radical Nephrectomy sparing adrenal as primary tumour was in the lower pole instead of a Partial Nephrectomy or Nephron sparing surgery.

- Histology: Multifocal chromophil renal cell carcinoma Furhman Gr 3, T1NoMo

- Creat 0.21 at discharge 4d post op
Mr J K

- 42 yr old male presented 21.6.00 to GP with 2d history of testicular discomfort. Clinically had a left varicocele. Testicular u/s confirmed Lt varicocele with a left renal mass with solid echotexture 3.5cm with no renal vein or IVC involvement. No hyperechoiec areas to suggest AML on U/S.

- CT scan 3.5 cm solid renal mass. Renal Vein & IVC clear. No lymphadenopathy. No fat density in tumour. No central scar.

- CXR NAD

- Lt Radical Nephrectomy sparing adrenal in view of young age with regular preperation as outlined in previous case on 22.6.00.
Mr J K

- At operation had 3 renal arteries and 2 renal veins. Vascular tumour adherant to Gerota’s fascia.
- Uneventful recovery
- Discharge D4 post op
- Creatinine at discharge 0.13 was 0.11 preop.
- Histology: AML with predominant spindle cells SMA positive.
- Angiomyolipomas (AML’s) form < 1% of renal tumours.
- Benign in nature generally can however undergo sarcomatous change
- Can cause morbidity by bleeding.
Mr. H S

- 6 6yr old retired aeronautical engineer with left testicular discomfort for several days
- Clinically has a 3.5 cm solid and craggy left testicular mass and bilateral varicoceles.
- Testicular U/S 3.5 cm hypervascular testicular mass. Bilateral varicoceles confirmed. 25.7.00
- CT chest/abdomen/pelvis Large precaval lymphnode and 1cm node in aortopulmonary window 28/7
- Pre OP workup FBE UECr LFT’s NAD beta HCG, AFP, LDH Neg ……most likely lymphoma clinically. 28.7.00
- 28.7.00 Lt Radical orchietomy and insertion of saline testicular prosthesis
Mr H S

- Uneventful recovery. Discharged after overnight stay.
- Histology Diffuse large B cell lymphoma of testis? Primary? Secondary
- Referral to Oncologist
- Uniformly poor prognosis