CASE REPORT

Renal injury in a patient with lumbar scoliosis

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SUMMARY

Kidney laceration following blunt trauma is responsible for up to 3% of trauma cases. The risk factors associated with renal injury are attributed to the risks of mechanical injury. However, anatomical variations that may accelerate the insult of injury are poorly documented. This case report describes a 25-year-old with degenerative lumbar scoliosis who presented with flank pain and visible haematuria following a low-impact injury. The patient had a grade IV renal injury. The curvature of the spine, shown on CT imaging, revealed a reduced retroperitoneal space around the left kidney. This case explores lumbar scoliosis as a risk factor for kidney laceration. We hypothesise that this increased risk is associated with asymmetry of the spine and reduced anatomical space in the retroperitoneum. Patients with lumbar scoliosis may be considered a high-risk category for renal injury, following low-impact trauma.

BACKGROUND

The kidneys are the most commonly affected organs in the renal tract following blunt trauma.¹ Kidney injuries make up 3% of trauma cases, often because of rapid deceleration, associated with road traffic accidents and falls.^{2,3} This causes renal contusion, haematoma and avulsion of the vascular pedicle. The injuries are graded from I–V using the modified American Association for the Surgery of Trauma grading system (table 1).⁴ Guidelines state that patients who present with blunt trauma

and haematuria require a CT scan.⁵ Patients with lumbar scoliosis may be at higher risk of renal injury following low-impact trauma.

Lumbar scoliosis is a three-dimensional deformity of the curvature of the spine in the coronal plane.⁶ The lateral edges encapsulate the kidney, in a confined retroperitoneal cavity, enhancing the damaging effect of rapid deceleration on the flank.⁷ This case report explores this risk factor in a young woman presenting with flank pain and haematuria (table 1).

CASE PRESENTATION

A 25-year-old female patient, with lumbar scoliosis, presented to accident and emergency with persistent visible haematuria for 2 days following a minor fall in the bath. She had no significant family history and was not on any medications.

On examination, her observations were stable. She was normotensive with a pulse of 83. Her abdomen was soft and non-tender with some mild ecchymosis on her left loin.

INVESTIGATIONS

Her blood tests on admission were unremarkable, her haemoglobin was stable at 136 g/dL and she was voiding rose-coloured urine. The patient underwent a CT abdomen and pelvis with contrast which confirmed a grade IV left renal injury, affecting the lower, posterior and medial regions, with a large perirenal haematoma (figure 1).

TREATMENT

The patient was observed over 72 hours due to the risk of renal rupture and developing haematoma. She had a repeat CT after 48 hours which showed slight resolution of the haematoma.

OUTCOME AND FOLLOW-UP

The patient was discharged back to her base hospital for renal function follow-up.

DISCUSSION

To the best of our knowledge, this is the first documented case of lumbar scoliosis, predisposing to renal injury following trauma. The volume of the abdominal cavity is altered in lumbar scoliosis. We hypothesise that the asymmetry of the spine results in an equally asymmetric load that perpetuates the deformity and further encapsulates the kidney. Therefore, the kidney is more vulnerable to damage following injury.

CT contrast of the abdomen and pelvis is routinely used in cases that present with blunt injury to the

Figure 1 The left lateral edge of the spine, encapsulating the left kidney, leaving it in a smaller anatomical region compared with a caudal spine.

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Table 1 The American Association for the Surgery of Trauma grading scale of kidney injury

Grade	Type of injury	Description of injury
I	Contusion	Microscopic or gross haematuria, normal urological studies.
	Haematoma	Subcapsular, non-expanding, without parenchymal laceration.
II	Haematoma	Non-expanding perirenal haematoma confirmed to renal retroperitoneum.
	Laceration	Less than 1.0 cm parenchymal depth of renal cortex without urinary extravasation.
III	Laceration	Less than 1.0 cm parenchymal depth of renal cortex without collecting system rupture or urinary extravasation.
	Laceration	Parenchymal laceration extending through renal cortex, medulla and collecting ducts.
IV	Vascular	Main renal artery or vein injury with contained haemorrhage.
	Laceration	Completely shattered kidney.
V	Laceration	Completely shattered kidney.
	Vascular	Avulsion of renal hilum which devascularises kidney.

flanks and haematuria.^{4 7} This case report has identified that

Learning points

- In patients with scoliosis, consider imaging of patients with low-impact injuries.
- Delayed presentation of patients with renal trauma should not be a barrier to immediate imaging.
- Changes in distribution of protective perirenal fat may mean lumbar scoliosis, predisposing patients to renal injury.

patients with lumbar scoliosis may be at higher risk of kidney laceration. CT imaging should be considered in these patients following low-impact blunt trauma.

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