

# Intraperitoneal bladder rupture and the wearing of rear seat-belts — a case report

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## SUMMARY

A case is reported of intraperitoneal bladder rupture which was seen 90 min post-injury and which was associated with a significant rise in serum urea and creatinine.

## INTRODUCTION

Traumatic rupture of the urinary bladder occurring in isolation is very rare, it is generally considered to be an associated injury; one major review quoting that in 89% of patients with bladder rupture other serious injuries were present (Cass & Luxenberg, 1987). In only two previously reported cases has traumatic bladder rupture been associated with the wearing of seat belts (Denis *et al.*, 1983).

Raised serum urea and creatinine in association with urinary tract disruption of many hours duration has been previously reported (Sawyer *et al.*, 1987), but very rapid rises have not.

## CASE REPORT

A previously healthy 8-year-old girl was travelling as a rear seat passenger in a car and was involved in a side on (her side) collision. She was wearing a three point seat belt.

On arrival in the accident and emergency (A&E) department, some 90 min after the accident, physical examination revealed pallor and clamminess to touch, pulse

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140 beats  $\text{min}^{-1}$  of low volume, blood pressure 80/40 mmHg. Respiratory rate 30 beats  $\text{min}^{-1}$  with absent basal breath sounds. Her abdomen was distended, tender and silent. There was marked bruising and abrasions over both iliac crests. Laboratory investigations revealed the following: haemoglobin,  $13.3 \text{ g d}^{-1}$ ; white cell count,  $31.3 \times 10^{-1}$  (78% neutrophils); sodium,  $141 \text{ mmol l}^{-1}$  (132–142); potassium,  $4.2 \text{ mmol l}^{-1}$  (3.4–5); urea,  $13.7 \text{ mmol l}^{-1}$  (1.7–6.6); and creatinine,  $246 \text{ umol l}^{-1}$  (35–125).

Although a provisional diagnosis of intraperitoneal haemorrhage was made the surgical team felt she was stable enough to be transferred to the radiology department where X-rays of skull, chest and pelvis were normal. Abdominal X-ray revealed acute dilation of the stomach and small bowel. Abdominal ultrasound showed 'considerable free fluid in the peritoneum. Liver, spleen and kidneys intact. mesenteric tear'. At laparotomy she was found to have a 5-cm linear tear of the fundus of her bladder and no other injury. Following repair of the bladder she made an uneventful recovery and was discharged home after 6 days. On the morning after surgery her serum biochemistry had returned to normal urea  $4.8 \text{ mmol l}^{-2}$ , creatinine  $92 \text{ umol l}^{-2}$ .

## DISCUSSION

Previously, bladder rupture due to trauma has been viewed as an associated injury occurring in one study with an average of 2.5 other injuries per person (Carr & Luxenberg, 1987). It is not illogical to assume, therefore, that in the absence of other injuries bladder rupture may be considered an unlikely diagnosis. However, in recent years a change in the pattern of injuries associated with road traffic accidents has been noted with a marked reduction in brain and facial injuries, intra-abdominal solid organ injuries and long bone fractures and an increase in whiplash, thoracic and intra-abdominal hollow viscus injuries. These changes have coincided with the compulsory use of front seat-belts (Simson, 1989).

The first report of intra-abdominal injury attributable to a seat-belt was in 1956 (Kulowski & Root, 1956). The commonest type of injury comprises abrasions, bruising and friction burns at the points of contact with the seat-belt – the so called 'seat-belt sign' (Doersch & Dozier, 1968). Our patient demonstrated this. In view of this, previously uncommon injuries such as bladder rupture may occur with increasing frequency. The legislation to make rear seat-belts compulsory may increase such injuries in the paediatric population.

The second interesting feature of this case was the rapid rise in the serum urea and creatinine. Intraperitoneal bladder rupture is invariably associated with a full bladder (Flanbaum *et al.*, 1988) and our patient subsequently confirmed that this was so in her case. At laparotomy she had approximately 200 ml of urine in her peritoneal cavity and it is not difficult to see why such a rapid reabsorption across the peritoneal membrane should occur.

## CONCLUSION

Intraperitoneal bladder rupture in isolation may present more frequently as rear seat-belt usage increases, especially in the paediatric population. It should therefore be considered early in all cases of blunt abdominal trauma associated with seat-belts. An acute rise in serum urea and creatinine may be helpful in making the diagnosis even in patients with the briefest histories.

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