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Letter to the Editor

Massive distension of urinary bladder in a patient with cervical spinal cord injury who was treated initially in a general hospital

We report a 63-year-old lady who developed tetraplegia (ASIA score C) following a fall. This patient was admitted to a general hospital. About 21 h after she was brought to the general hospital, she was catheterised. During the next half an hour, 2,700 ml of urine was drained. Subsequently, the indwelling urethral catheter drainage was continued. Six days later, it was observed that the catheter was barely draining. She developed lower abdominal distension. X-ray abdomen showed massive distension of bladder (Figure 1b). After re-catheterisation, 3100 ml of urine was drained between 2200 and 2400 h. During the first week after the spinal cord injury, she developed upper gastrointestinal bleeding and ileus (Figure 1a,c). She was transferred to a spinal unit 40 days after she developed tetraplegia.

This case illustrates the fact that patients with spinal cord injury (SCI) should preferably be treated in a specialised spinal unit by health professionals who are familiar with the changes in different body systems consequent to spinal cord trauma, e.g. autonomic dysfunction, neuropathic bladder and bowels.

Based on epidemiological data from two populations of patients with acute spinal cord injury, Tator and associates[1] showed that the patients treated in a regional, specialised acute spinal cord injury unit had the following advantages. There was significant reduction in the mortality rate of almost 50% ($P=0.022$), a significant reduction in the length of stay of almost 50% ($P<0.001$), and a significant increase in neurological recovery consisting of a doubling of the neurological recovery scale utilised ($P<0.001$). These results support the view that management of patients with acute spinal cord injury in a regional, multidisciplinary unit is medically advantageous and can reduce the length of stay and cost of care as well.[2]

This patient developed massive distension of urinary bladder twice during her stay in a general hospital. Over-distension causes damage primarily to the bladder urothelium, and to a lesser extent to the muscular layer. Urothelium integrity is destroyed for several days, which makes it possible for various substances in the urine to penetrate into the bladder wall and allows for bacterial adherence.[3] Thus patients who develop over-distension of urinary bladder are at high risk for developing cystitis.

Bladder over-distension has been found to cause transitional morphological changes in innervation which correlate with changes in micturition and bladder contractility.[4] In animal studies, damage to the bladder wall innervation has been found following over-distension. Over-distension causes a proliferative reaction within the bladder wall. Its initial effects occur within the urothelium, and the later involvement of the subendothelial smooth muscle and connective tissue is directly proportional to the degree of bladder distension. Three weeks following over-distension, the functional state of the urinary bladder was not completely recovered.[5] Thus bladder over-distension may result in delayed recovery of reflex bladder function in the patients with cervical spinal cord injury.

It is, therefore, clear that over-distension of urinary bladder may have long-lasting and deleterious effects in the patients with spinal cord injury.

- Recovery of reflex bladder function may be delayed.
- Over-distension may increase the susceptibility to cystitis.
- Distension of bladder may produce autonomic dysreflexia even during the acute stage of spinal cord injury, albeit rarely.[6]
- Bladder distension may produce venous obstruction of the lower extremity.[7]
- Acute bladder distension causes a reduction in urine production in humans.[8]
- Distension of the urinary bladder causes an increase in efferent sympathetic activity, which can precipitate myocardial ischaemia.[9] Urinary bladder distension significantly decreased coronary blood flow and increased coronary resistance as compared with baseline values in the patients with early atherosclerosis.[10] In smokers, distension of urinary bladder induces exaggerated coronary constriction.[9]

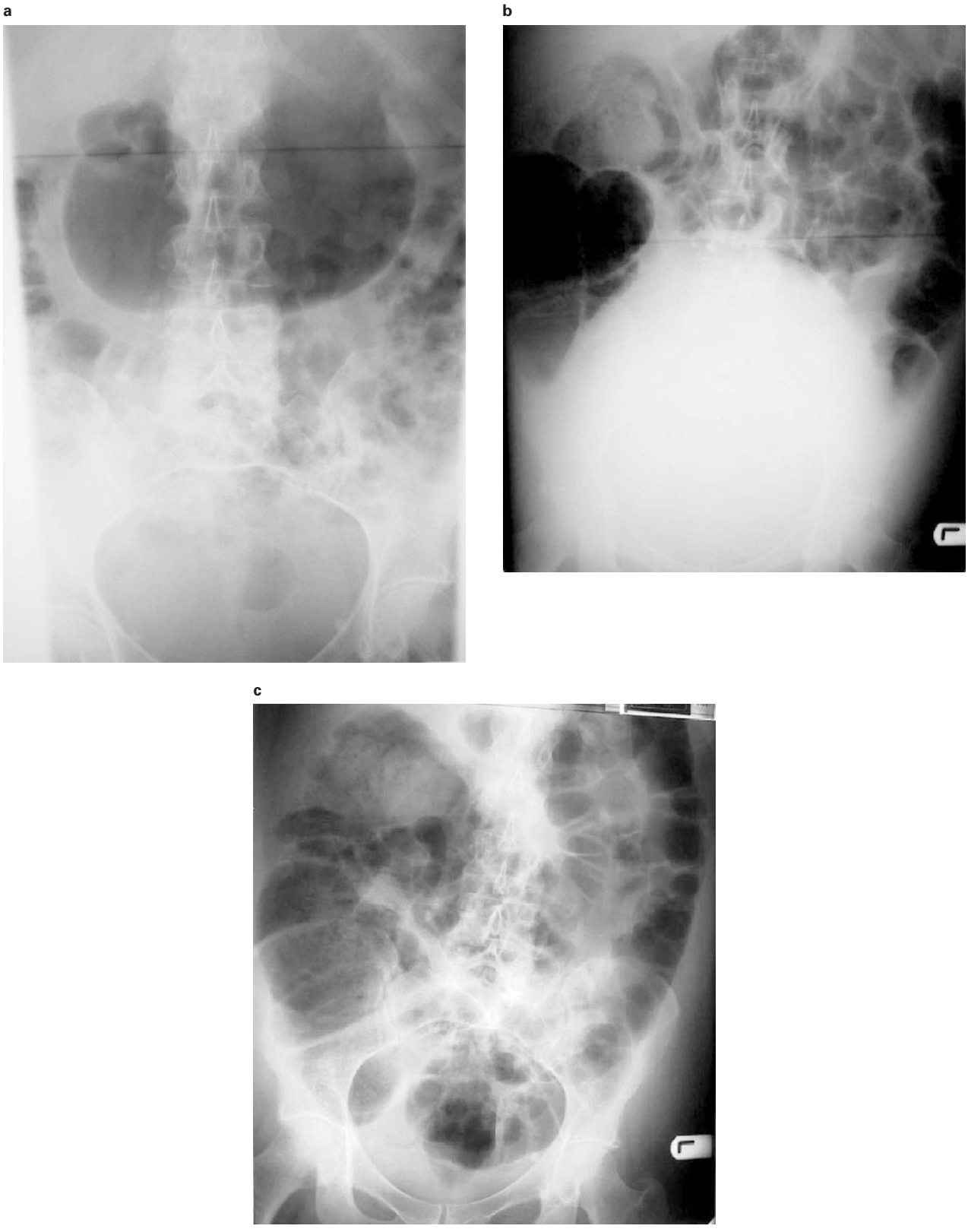

Figure 1 (a) Supine X-ray of abdomen taken on the day of injury: there is moderate gaseous distension of the stomach. (b) X-ray abdomen taken 6 days after the patient sustained cervical spinal cord injury: Note massive distension of urinary bladder. After re-catheterisation, 3100 ml of urine was drained. (c) X-ray abdomen taken on the seventh day after trauma: the urinary bladder has been drained; but there is moderate gaseous distension of colon and small bowel. There is marked faecal loading of the ascending colon

In conclusion, this patient with teraplegia was allowed to develop massive distension of urinary bladder twice during her stay in a general hospital. Failure to avoid preventable complications in SCI patients significantly increases the total time spent in hospitals.[11]

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