

achieved without any muscle relaxants.<sup>4</sup> If intubation is indicated, suxamethonium is contraindicated as it will exacerbate the existing hyperkalaemia and have no effect on the skeletal muscles as they are already depolarised. An anaesthetic induction agent alone is all that is needed to facilitate intubation and ventilation.

Immediate treatment includes the administration of calcium intravenously to prevent cardiac deterioration by stabilising the myocardial cell membrane and this can be given as either 10% calcium gluconate or 10% calcium chloride. Calcium should be given over five minutes under constant ECG monitoring but its stabilising effect will only be transient.

The hyperkalaemia is treated with a dextrose/insulin infusion which may reduce serum potassium as quickly as 1 mmol/l in 30 minutes because of the resultant intracellular shift of potassium. This occurs because the intracellular formation of phosphorylated glucose intermediates and glycogen bind potassium.

Soluble insulin is used with 50% dextrose in a ratio of one unit per 10 ml (5 g) and 100 ml infused over an hour. Rapid infusion must be avoided as it may cause a transient rise in serum potassium by its osmotic effect on cells.

Sodium bicarbonate should always be considered as it causes a prompt decline in serum potassium for a number of reasons. Firstly, it buffers hydrogen ions in the extracellular space and so promotes the intracellular shift of potassium. Secondly, by reversing a metabolic acidosis, potassium secretion into the distal tubule of the kidney is enhanced. Thirdly, as a hypertonic solution it will have a simple dilutional effect upon potassium and finally, in those patients with coexisting hyponatraemia, the salt load helps correct this and so improves Na<sup>+</sup>/K<sup>+</sup> exchange. However, it must be administered cautiously as such a high sodium load can easily precipitate fluid overload especially in patients with renal insufficiency. An 8.4%

solution can be given as 50 ml over an hour and its effect will last two hours. An alternative intravenous route to that used for calcium must be used to avoid the precipitation of calcium bicarbonate.

Recent research now demonstrates that both nebulised and intravenous  $\beta$  agonists such as salbutamol also rapidly reduce serum potassium in patients with chronic renal failure. It is thought that endogenous catecholamines promote the intracellular shift of potassium and by stimulating the release of these catecholamines,  $\beta$  agonists may have a role in the treatment of hyperkalaemia.<sup>5,6</sup>

Exchange cation resins such as calcium resonium remove potassium from the body and can be given orally or rectally. These resins can rapidly decrease serum potassium within 30 minutes and will continue to act for many hours.

As these pharmacologic agents will only temporarily reduce potassium, starting dialysis or haemofiltration must be the next priority. This will quickly restore normal electrolyte and acid-base balance while the cause for the hyperkalaemia is urgently sought.

We would recommend a 12 lead ECG and urgent serum potassium measurement in any patient presenting with paralysis, as this rare but readily reversible condition will then be quickly recognised.

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## An unusual case of urinary retention due to imperforate hymen

David J Hall

### Abstract

**A 15 year old girl presented to the accident and emergency (A&E) department with a 24 hour history of lower abdominal pain, and was found to have acute urinary retention. She was discovered to have an imperforate hymen with associated haematocolpos and haematometrium. This is rare and is hence a very unusual presentation to the A&E department. Patients presenting with retention of urine should be carefully assessed for the cause.**

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Keywords: urinary retention; imperforate hymen

### Case report

A 15 year old girl presented to the accident and emergency (A&E) department with a 24 hour history of lower abdominal pain. She reported frequency of micturition and dysuria, and gave a history suggestive of being constipated, although her bowels had been opened the previous day.

Examination revealed her to be in discomfort and to have a fever of 38°C but she was otherwise not systemically unwell. An abdominal mass extending from the pelvis to the umbilicus was noted and a presumptive diagnosis of acute urinary retention secondary to constipation and urinary infection was made.

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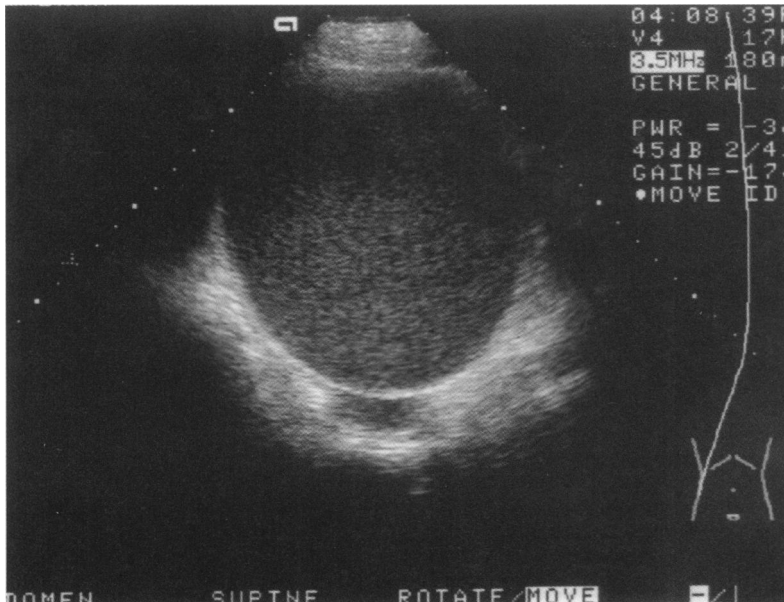


Figure 1 Ultrasonography showing dilated uterine cavity.

On catheterisation of the bladder, however, the external genitalia were noted to be markedly abnormal. There was no vaginal orifice and the hymen was intact and bulging. Secondary sexual characteristics were normal. The patient reported that she had not yet experienced a menstrual period.

After catheterisation 1000 ml of urine was drained. Subsequent pelvic ultrasonography revealed a massively dilated uterine cavity (fig 1), to the level of the umbilicus, with a dilated vagina extending to within 1 cm of the perineal surface.

At operation the hymen was incised and 1500 ml of old blood drained. The patient went on to make a full and uneventful recovery.

## Discussion

The overall incidence of imperforate hymen is unknown. In an American series of 254 vaginal malformations 17 of the patients had an imperforate hymen.<sup>1</sup> The authors of the paper estimated the incidence of vaginal agenesis to be one in 10 500 births and vaginal agenesis was 10 times more common than imperforate hymen in their series. Thus it can be seen that imperforate hymen is certainly uncommon.

The incidence of associated acute retention of urine has been stated to be rare.<sup>2</sup> Alternatively in a series of 26 cases of imperforate hymen reported by Calvin and Nichamin, 12 cases of the 26 (46%) presented with acute urinary retention.<sup>3</sup> Urinary retention may occur when the retained menstrual products in the vagina compress the urethra and there is angulation of the urethra caused by pressure on the posterior wall of the bladder, again by retained menstrual products. This condition is not usually associated with other abnormalities.<sup>4</sup>

Other causes of acute urinary retention in children include constipation, urinary infection, postoperative causes, pelvic abscess, trauma, neurogenic bladder, urethral valves, and tumours.<sup>5</sup>

This condition has not been described before in the UK A&E literature. It is reported here to emphasise the importance of assessment of the cause of acute urinary retention in patients whose age and sex make the diagnosis unusual.

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## Axillary vein thrombosis mimicking muscular strain

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### Abstract

**Axillary vein thrombosis may occur on strenuous activity with a clinical picture similar to a simple strain. It carries significant morbidity but a good outcome is possible with early treatment. The aetiology, investigation, and treatment are discussed.** (*J Accid Emerg Med* 1999;16:233-234)

Keywords: axillary vein thrombosis; upper limb injury; thrombolysis; vascular injury

### Case report

A 23 year old man presented with history of aching and tightness in his right arm since rock

climbing two weeks previously. While climbing he had reached above his head for a handhold and, on pulling himself up, experienced a sudden sharp pain in his axilla. He had treated himself for a muscular strain with rest and non-steroidal anti-inflammatory drugs but his symptoms had progressively worsened.

The arm was diffusely swollen with a 2 cm × 1 cm bruise in the axilla. The patient had prominent superficial veins bilaterally but those on the right failed to empty on elevation. There was no tenderness and shoulder movements were normal.

Axillary vein thrombosis was suspected and venography was performed showing complete

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