Neonatal non-laparoscopic non-robotic pneumovesical distension presenting as acute abdomen

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DESCRIPTION

A term baby girl diagnosed prenatally with complex congenital heart disease was being investigated in the cardiac intensive care unit (ICU). The baby was stable on nasal oxygen and having full nasogastric feeds. Her urinary catheter was blocked despite the administration of 60 mL saline for irrigation and 60 mL of air via a bladder syringe by an evening duty nurse with urology experience. A Foley balloon inflated with saline failed to deflate, so the nurse injected 60 mL of air with a syringe through the balloon catheter channel in order to rupture the balloon. This was not documented in the notes. That night the baby's oxygen saturation decreased, she developed abdominal distension and an increase in lactate levels was noted. Chest and abdominal radiographs showed a large gas shadow in the central abdomen without any air under the domes

of the diaphragm or any evidence of necrotising enterocolitis (figure 1A, B). The patient was referred to the surgical team for possible contained bowel perforation. The abdomen was distended but soft and bowel sounds were normal. At exploration, there was no free gas or fluid, but the bladder was seen to be inflated with air. Needle aspiration confirmed this and was used to decompress the distended bladder. Cystourethroscopy showed several small remnants of a Foley catheter balloon which were removed. The post-operative period was uneventful (figure 1C, D).

Pneumodistension of the bladder is used in laparoscopic and robotic bladder surgery, but otherwise very small amounts of air are present in the bladder, even in pathological states.¹ Foley catheter lumen blockade and simultaneous blockade of the non-return valve channel is rare and requires

Figure 1 (A) Chest radiograph showing central abdominal gas; (B) abdominal radiograph showing central abdominal well-defined cystic pneumodistension; (C, D) post-operative chest and abdominal radiographs.

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Learning points

- ▶ The normal capacity of a neonatal bladder is 30 mL, so the injection of 60 mL volume each of saline and air to unblock a catheter lumen followed by another 60 mL of air for a total volume of 180 mL caused acute pneumodistension in this patient.
- ▶ To prevent rare blockage by sodium chloride crystals of the lumen and non-return inflation valve in a Foley catheter, the balloon should be inflated with sterile water rather than normal saline.
- ▶ If deflating the balloon with an empty syringe presents a problem, normal procedures should be employed or those described in the specialist literature should be followed by a suitably qualified, trained and experienced neonatal and paediatric urologist.
- ▶ Foley balloons must never be inflated above the stated volume in order to rupture them as this can cause further complications.
- ▶ If a Foley balloon is ruptured, all larger fragments not passed in the urine must be carefully removed from the bladder as they may act as nidus for urosepsis and urolithiasis requiring surgery for bladder stone removal.

expert attention.^{2 3} The most common neonatal and paediatric urology emergency in ICUs is posterior urethral injury caused by inflation of the balloon during insertion of a Foley catheter, typically in a male baby, leading to partial urethral rupture and

catastrophic sequelae. We wish to emphasise the importance of protocols, and the education and training of ICU staff in the insertion, maintenance and removal of Foley catheters even if they have previous exposure to urology nursing. If the nurse in this case had realised the normal size of a neonatal bladder, he/she would never have injected as much air/fluid as was seen in this patient. Staff education, training and the implementation of a practical protocol are important for preventing such avoidable mistake in ICUs. This case serves as a very strong reminder of this rare complication and hopefully our experience will help prevent this error occurring again.

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