

# Inadvertent inflation of Foley catheter balloon with contrast: an error that caused unnecessary apprehensions

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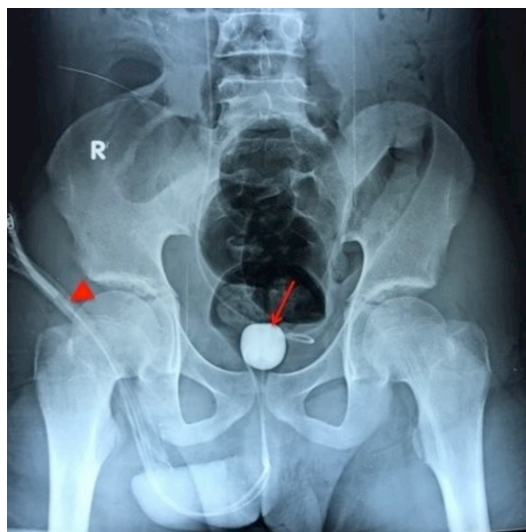
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## DESCRIPTION

A 30-year-old male patient underwent percutaneous nephrolithotomy (PCNL) for a 3.5 cm right renal calculus. As per our institutional protocol he underwent a check X-ray the next day. The relatives of the patient immediately came to us asking whether some residual fragments of the calculus were there in the urinary bladder. When we reviewed the X-ray film, there was a radio-opaque shadow in the region of urinary bladder. On careful examination this shadow was continuous with a radio-opaque line along the Foley catheter (figure 1). We immediately removed the Foley catheter and did another check X-ray. The shadow had disappeared. We then realised that the catheter's balloon was inflated with contrast solution prepared for fluoroscopy-guided puncture during PCNL. We acknowledged this error to the patient and his relatives and explained them how sorry we were for their anxiety, following which they were relieved that it was the Foley catheter bulb and not residual stones.

We usually prepare a contrast solution for puncture during PCNL with a 1:3 dilution with sterile water. The appearance of the Foley catheter balloon inflated with contrast was similar to a round vesical calculus and that caused

apprehension in the patient's mind that was relieved on doing the check X-ray after removal of the Foley catheter. Access into the pelvicalyceal system (PCS) for PCNL is usually done via fluoroscopy-guided puncture with the patient in prone position.<sup>1</sup> A ureteric catheter is placed before this so that the contrast solution can be instilled into the PCS for identifying the calyceal anatomy and also it can be used to flush small fragments of calculus during PCNL. A Foley catheter is also placed along with the ureteric catheter to secure it. The ureteric catheter is usually removed immediately after PCNL and the Foley catheter is retained, and removed later in the ward. Ideal solution for filling the balloon of a Foley catheter is sterile water as ionic solutions can cause crystallisation and subsequent difficulty in catheter removal.<sup>2</sup> Other authors have proposed that 0.9% saline and 1.5% glycine can also be used without any risk of complications.<sup>3</sup> We usually use sterile water or 0.9% saline that is kept in a separate sterile bowl for this purpose, but in this case the diluted contrast solution was mistaken for sterile water and instilled into the Foley catheter balloon. The contrast solution and sterile water were kept in separate sterile bowls but if they would have been kept in separate sized syringes it could have prevented this error. Also contrast is more viscous we could have differentiated it from sterile water



**Figure 1** A plain X-ray showing the Foley catheter balloon filled with contrast (arrow). Also seen is the contrast in the balloon inflation channel of the catheter (arrowhead).

## Learning points

- ▶ One should be careful during urological procedures where contrast is commonly used, as the solution is transparent and visually cannot be differentiated from 0.9% saline used for flushing stones and other transparent solutions.
- ▶ This error can be avoided by keeping the contrast solution in separate sized syringes, also the operator can feel the resistance in the syringe during inflation and stickiness after it due to the greater viscosity of contrast as an indirect indicator of this error.
- ▶ If inadvertently contrast has been used for inflating the Foley catheter balloon it can be identified on X-ray with certain signs such as a radio-opaque line on the catheter due to contrast in the inflation channel and a smooth round contour of the radio-opaque Foley catheter bulb.



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by the resistance in the syringe while inflating and stickiness after inflating it, which we missed. Contrast solution being more viscous can clog the channel for balloon inflation. In our case, it did not happen because we removed the catheter on the next day and it was a diluted contrast solution.

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