Letter to Editor
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I Chucked-Out the Tube! Broken Epidural Catheter due to Patient Misadventure

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Sir,

A 50 years old male was posted for elective left sided radical nephrectomy for renal cell carcinoma. He was known case of diabetes, hypertension and previous myocardial infarction. Physical examination including lumbar spine was unremarkable and investigations were within normal limits.

Combined epidural and general anaesthesia was planned and informed and written consent obtained from the patient. Epidural catheter [hospital supply- generic, no.18G needle and catheter (close ended, 3 side-holes in terminal 1 cm, length 100 cm, markings till 25 cm, no radio opaque line) with Loss of Resistance (LOR) syringe] was inserted by paramedian approach at T12-L1 in sitting position; space was reached at 5 cm from skin by LOR; catheter was threaded caudally for 3 cm in the epidural space and secured.

Epidural anaesthesia was activated followed by induction of general anaesthesia with endotracheal intubation. Surgery was completed uneventfully in supine position. Till the morning dose of day 2, the catheter was in situ and top ups could be administered without difficulty. During the visit for the top-up on day 2 afternoon, it was found that the catheter was missing and found on the

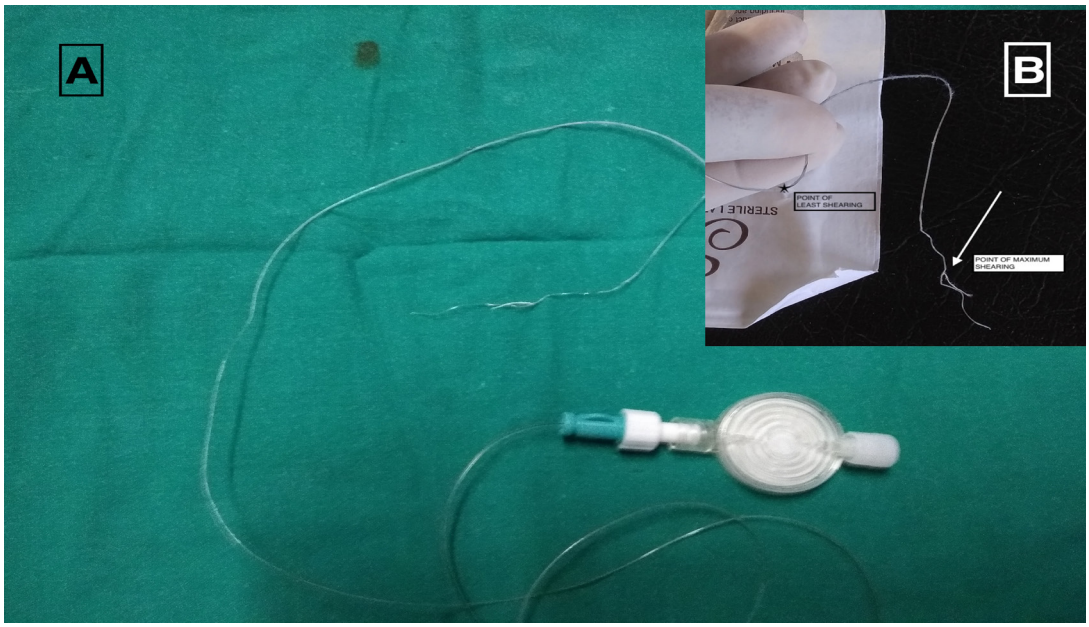

Figure 1. Sheared segment of epidural catheter.

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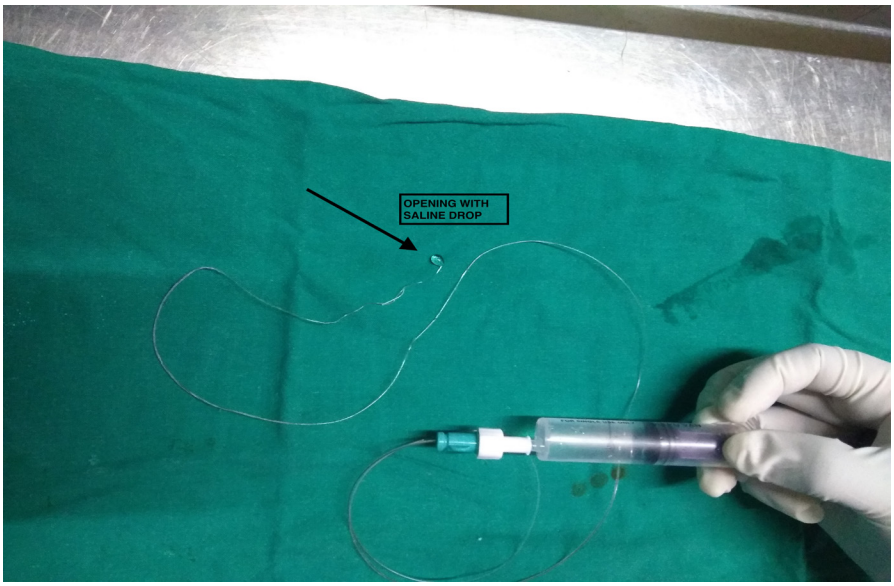

Figure 2. Single terminal hole of sheared segment (3 side-holes missing).

bedside trolley. On enquiry, patient informed that he had pulled out the catheter an hour before, as he had intense itching. Local examination showed clear surface over the epidural insertion site, with no local signs.

A meticulous examination of pulled out catheter indicated shearing off of the outer sheath by 3 cm from the tip with retention of the inner core remnants (Figure 1). When saline was flushed through the catheter, release from only one 'terminal opening' was seen, indicating damage to core portion as well (Figure 2). Patient and attending specialist were informed of the event and risks of persistence of catheter material within the epidural space and asked to report development of any neurological symptoms. Neurological consultation did not reveal any relevant signs. X ray evaluation of the spine did not reveal broken piece(catheter without radiopaque marker line). Hence, Computerised Tomography (CT) was also not attempted. Magnetic resonance imaging was planned to localize the missing segment but not taken up due to patient refusal.

Epidural catheters may get kinked, knotted, sheared, broken or migrate; the broken piece may lie in epidural space or migrate further into different tissue spaces[1,2]. Epidural catheter is more likely to get cut when operator attempts to pull the epidural catheter out with epidural needle in situ; it typically gets cut while passing out through the needle tip[3,4]. Thoracic epidural approach may be associated with more problems compared to others[2]. In the current report, the patient himself had pulled out the catheter turning to one side from the lowermost accessible area. Removal of a catheter is recommended to be gentle and performed in the same position as during insertion[3] (sitting in the current case and flexion in lateral position in others), so that there is least resistance. Pain during removal indicates knotting around a spinal nerve[3]; the patient did not inform of pain when he removed himself. He probably had local itching related to the adhesive plaster. Also, we had inserted in paramedian position and it is less likely to encounter resistance during removal as compared to midline insertion. A length of 3 cm was within the epidural space, well within the maximum recommended 5cm. We inferred that the patient may have used an exaggerated and sudden force to pull off the catheter, resulting in damage of the 'substandard' catheter. The retained parts may not precipitate any problems but there could be risks such as development of epidural abscess and migration[5]. Hence, it is imperative that the patient is informed of the risks, investigations (X ray, CT, Ultrasound, MRI) carried out with neuro-specialist involvement with follow up of the patient. Surgical intervention may be needed only when symptoms and signs arise[5]. All details need to be

documented clearly for medicolegal purposes. We also feel that accidents as reported here are a result of lack of implementation of quality standards with respect to epidural catheters, related to the material strength and radio-opaque markers. The ideal characteristics of catheters as summarised by Bromage are biochemical inertness, low coefficient of friction, high tensile strength, manoeuvrable rigidity, kink resistance, atraumatic tip, depth indicators, and radiopacity[5]. The catheter used in this report did not have radio opaque line. Our attempts to contact the manufacturers for clarifications have not been successful.

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