CASE REPORT

Fracture of temporary femoral haemodialysis catheter: our experience

Sanjay D Cruz,¹ Monica Gupta,¹ Ravinder Kaur,² Sanjay Gupta³¹Department of Medicine, Government Medical College and Hospital, Chandigarh, India²Department of Radiodiagnosis, Government Medical College and Hospital, Chandigarh, India³Department of Surgery, Government Medical College and Hospital, Chandigarh, India**Correspondence to**Dr Monica Gupta,
monicamanish2001@gmail.com**SUMMARY**

We report two similar cases of fracture and proximal migration of temporary femoral haemodialysis catheters. The two cases were encountered 6 years apart. These types of occurrences, especially in centres where catheter reuse is practiced, are not uncommon but seldom reported in the literature. Alert dialysis staff on both the occasions took remedial steps in time, which prevented embolisation of the catheters into the inferior vena cava. Both the catheters were removed successfully by the surgical team.

BACKGROUND

The use of temporary or semipermanent haemodialysis catheter remains an essential tool for vascular access in haemodialysis, both for the management of acute renal failure and in chronic renal failure as a temporary modality of vascular access in whom permanent access is not available. Femoral, subclavian and internal jugular venous access has been widely used for temporary vascular access for haemodialysis, but their use has been associated with a significant complication rate both mechanical and infective.¹ We report two such rare cases occurring over a span of 6 years of fracture of temporary single lumen femoral catheters that had migrated proximally.

CASE PRESENTATION**Case 1**

A 45-year-old man was taken up for regular intermittent haemodialysis. He was recently diagnosed as a case of end-stage renal failure 2 weeks back, when he had presented with symptoms of uraemia to the emergency department. He was planned for renal transplantation and started on intermittent haemodialysis three times a week, with a plan for creation of an arteriovenous fistula. On examination, the patient had heart rate of 110/min and blood pressure of 140/90 mm Hg. Except for pallor, the general physical and systemic examination was normal.

Case 2

A 38-year-old woman with acute kidney injury was taken up for regular intermittent haemodialysis. An internal jugular line was inserted initially, which had to be removed owing to catheter site infection. She was on regular dialysis awaiting renal recovery. On examination, the patient had heart rate of 94/min and blood pressure of 130/86 mm Hg. Except for pallor, the general physical and systemic examination was unremarkable.

INVESTIGATIONS**Case 1**

The investigations showed haemoglobin 8.2 gm/dL, normal total leucocyte count, platelets and erythrocyte sedimentation rate (ESR). Biochemical profile revealed serum sodium 146 meq/L, potassium 5.0 meq/L, blood urea nitrogen 117 mg/dL, serum creatine 6.3 mg/dL, serum calcium 8.0 mg/dL, phosphorus 4.0 mg/dL and normal liver enzymes. The serology for hepatitis B surface antigen (HBsAg), anti-hepatitis C virus (HCV) and HIV were negative.

Case 2

The investigations revealed haemoglobin 9.6 gm/dL, normal total leucocyte count, platelets and ESR. In the biochemical profile, serum sodium 136 meq/L, potassium 4.1 meq/L, blood urea nitrogen 98 mg/dL, serum creatine 5.3 mg/dL, serum calcium 9.2 mg/dL, phosphorus 3.8 mg/dL and normal liver enzymes. The serology for HBsAg, anti-HCV and HIV were negative.

TREATMENT

In both the cases femoral puncture was performed for vascular access using a single lumen femoral catheter. As soon as the cannula was inserted and the guidewire withdrawn, it fractured leaving the polyurethane tube inside the femoral vein. Local pressure was applied at the site and the head end of the patient was elevated (to take the aid of gravity) by the alert dialysis staff to prevent the migration of the catheter proximally. Urgent radiographs of the pelvis, abdomen and chest failed to localise the cannula. Grey scale sonography with 11 MHz linear probe showed the cannula to be in the femoral vein just proximal to the insertion site, with its proximal end lying in the external iliac vein in both the cases (figure 1).

OUTCOME AND FOLLOW-UP

Both the patients were immediately taken up for surgery (figures 2 and 3) and the cannulas were removed. Postoperatively both of them had an uneventful and successful recovery.

DISCUSSION

Intermittent use of haemodialysis catheter in the femoral vein is infrequently associated with complications. The list of such complications include local haematoma, bleeding, thrombosis, septicemia, inadvertent insertion into the femoral artery and femoral arteriovenous fistula.^{1 2} Very rarely fracture of the catheter with or without embolisation has been observed more so in case of indwelling catheters.^{3 4}

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Figure 1 Grey scale sonography with 11 MHz linear probe shows the cannula in the femoral vein.

In India most patients of chronic kidney disease are not under regular follow-up with the nephrologists and at times present to the emergency room with advanced uraemia. In these patients

Figure 2 Intraoperative picture of the catheter lying in the external iliac vein.

there is no permanent vascular access and hence they have to be dialysed using a temporary access (single/double lumen femoral catheter or double lumen central venous haemodialysis catheters). In our country in the patients undergoing acute dialysis, femoral access is still prevalent as compared with double lumen central venous haemodialysis catheters primarily owing to monetary considerations. Moreover, this site is convenient and safe.⁵ The ease of catheter insertion and rate of catheter related bacteraemia as compared with internal jugular vein makes the femoral catheter a viable option too.⁶ The procedure may be further complicated by venous thrombosis, local haematoma and abnormal vein position from multiple attempts at venous access.⁷ Occasionally a fractured catheter can be associated with devastating consequences of thromboembolism requiring percutaneous transluminal removal or major cardiothoracic surgery.⁸

In the developing world reuse of haemodialysis catheters is a common practice owing to economic constraints. Reuse of catheters leads to an increased risk of both mechanical and infective complications. In the index cases, the catheter was being used for the third and second time, respectively. Timely detection and intervention as in the index cases can prevent the aforementioned complications. The dialysis staff should be alerted about this potential life-threatening complication and be educated on how to tackle such situations. Acute catheters should be inserted in the internal jugular, subclavian or femoral vein preferably under ultrasound guidance wherever feasible, to minimise complications.⁹ Though these incidents may be occurring albeit infrequently, they are seldom reported owing to certain restrictions, like confidentiality concerns and issues related to peer review protection from liability.

Figure 3 The fractured femoral hemodialysis catheter after removal from the external iliac vein.

Learning points

- ▶ To make the practicing physicians and nephrologists especially in developing nations, where catheter reuse is common, aware of this very unique but life-threatening complication.
- ▶ Dialysis nurses and paramedical staff should be educated on how to promptly manage such events.
- ▶ Simple measures like local site pressure following femoral catheter fracture and elevation of head end of the patient can prevent proximal migration and embolisation of the catheter.

Contributors SDC and MG are the nephrologist and physician, respectively who have seen and managed the cases in emergency and dialysis units and have drafted the initial version of this manuscript. RK is the radiologist and SG is the surgeon involved who have provided valuable inputs into case management. All the authors have critically analysed the text, images and contributed significantly in shaping the final manuscript.

Competing interests None.

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