Spontaneous and Early Fracture of Hemodialysis Catheter leading to Embolization and Endovascular Emergency

Muhammad Jamil[1], Habib Muhammad Reazaul Karim[2], Akash Handique[3], Muhammad Yunus[4]

[1]*Assistant Professor, Department of General Medicine, North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences, Meghalaya, India*
[2]*Senior Resident, Department of Anaesthesiology and Critical Care, North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences, Meghalaya, India*
[3]*Associate Professor, Department of Radiology & Imaging, North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences, Meghalaya, India*
[4]*Additional Professor and Faculty In Charge, Department of Anaesthesiology and Emergency Medicine, North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences, Meghalaya, India*

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Correspondence to: Dr Habib Muhammad Reazaul Karim

Address: Department of Anesthesiology and Critical Care, North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences, Meghalaya, India

E-mail: drhabibkarim@gmail.com

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ABSTRACT

Hemodialysis through a central venous catheter (CVC) is advised to be used only in acute renal failure setting and as temporary bridging access for patients awaiting arterio-venous fistula. However, it is not uncommon to even patients with end stage renal disease (ESRD), to have their hemodialysis done through temporary CVC for long duration without any attempt to have permanent access. Complications are not uncommon with such lines. Commonly encountered complications are infection, thrombosis, haemorrhage, arterio-venous malformation, and pseudoaneurysm etc. Among the uncommon complications, migration of fractured CVC, migration of guide wire, fracture of the tip of catheter with embolization etc are described. We report an early fracture (on 3rd day) of a femoral venous catheter and embolization leading to an emergency in a 44 year old woman with ESRD which was successfully retrieved by endovascular intervention.

Keywords: Hemodialysis; Central Venous Catheter; Complication; Fracture and Embolization; Interventional Radiology

INTRODUCTION

A good and functioning vascular access is the mainstay for successful hemodialysis (HD). Autogenous arterio-venous fistula (AVF) remains the first choice for vascular access and is strongly recommended for chronic HD due to its longevity and low morbidity and mortality [1, 2]. AVF needs to be planned 4-8 weeks before starting HD to allow time for maturation. This is possible only when chronic kidney disease (CKD) patients are diagnosed at an early stage and are under follow up. However, majority of CKD patients in India present with End Stage Renal Disease (ESRD) and require urgent HD through a temporary vascular access[3, 4]. Non cuffed, non-tunnelled femoral central venous catheter (CVC) is often used for urgent HD and catheter fracture is rare but dangerous complication [5].

CASE REPORT

A 44 year old woman was referred to our centre for migrated femoral venous catheter. She had ESRD and was on continuous ambulatory peritoneal dialysis for three months and had developed peritonitis with catheter blockage. She was transferred to HD through femoral venous catheter. On the 3rd day with femoral catheter, technician noticed that femoral catheter was fractured near the entry point, On attempt to retrieve it, catheter broke and migrated upward. Immediate X-ray (Figure 1) showed the position of the fracture catheter in the external iliac vein and she was referred to our center for further management. Patient was hemodynamically stable. Urgent color Doppler study in the emergency department showed the fractured catheter inside the external iliac vein extending into common iliac vein without blockage of

blood flow. However, by the time patient was prepared for emergency intervention, catheter showed migration proximally leading to embolization in to the common iliac vein and inferior vena cava. The migrated femoral catheter was retrieved under C-arm guidance with the help of interventional radiology department using a stone retrieval basket from Boston Scientific (Figure 2a, 2b). She was discharged with an AVF for subsequent maintenance HD.

DISCUSSION

HD is the basic form of renal replacement therapy for ESRD. Maintenance of a good and functioning vascular access is the mainstay for efficient and successful long term HD. Elective creation of AVF before starting dialysis for chronic HD is preferred for its longevity and low morbidity and mortality [1]. However, in a developing country like India, planned care for ESRD is usually not possible as 65% of CKD patients present to hospital / nephrologists with ESRD requiring dialysis [3]. These patients' needs urgent HD. Percutaneous non cuffed central catheters are used for such immediate HD.

Catheter fracture and embolization is reported in up to 3% cases in long term indwelling central catheter used for chemotherapy in cancer patients [7]. Incidence data for fracture and embolization of CVC used for HD is relatively lacking. Literature search reveals reports of mostly single cases. Reporting of 2 cases over a 6 year period from same the institution indicate that the incidence will be probably <1% [8]. Reported morbidity and mortality are also as high as 71% and 30-38% respectively [10, 11]. Literature supports long duration of catheter as a predisposing factor for fracture but in the present case, fracture occurred on 3rd day of insertion implicating that it is not necessarily a complication of long term catheter. Endovascular management is safe and usually avoids the need for general anaesthesia and major vascular surgery related mortality and morbidity. Retrieval of embolized fractured CVC segment appears to be quite effective and devoid of significant complication [12]. The present case was managed successfully on emergent basis without any complication by endovascular retrieval using snare.

In conclusion, fracture and migration of CVC is a rare but potentially fatal complication. Early referral to a tertiary care centre with endovascular intervention facility can obviate the need of open surgery and potentially save lives.

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Figure 1: X-Ray showing fractured catheter as radio-opaque line (white arrow) in the external iliac vein

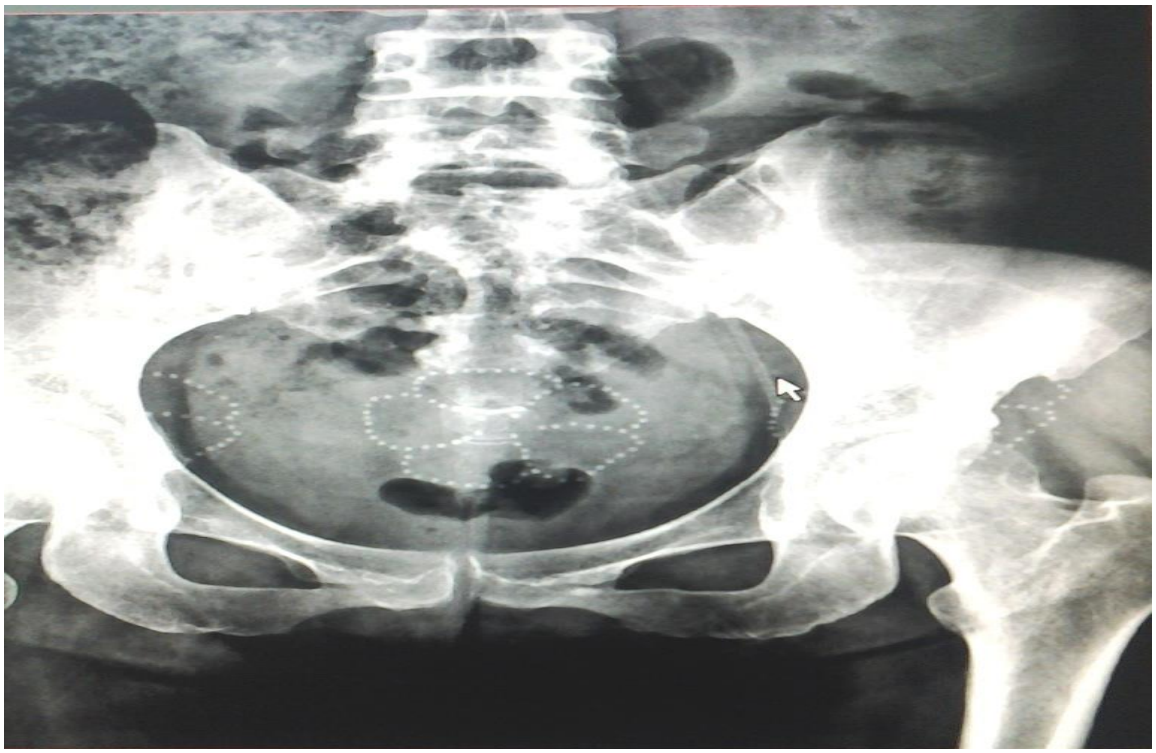

Figure 2: (2a): Showing the grasped fractured catheter coming out of femoral puncture point along with femoral sheath. (2b) the fractured catheter after retrieval (black arrow) and the stone retrieval basket used for retrieval (white solid arrow)