



Bilateral Venous Femoral Catheter Fracture and Migration: Case Report and Review of Literature

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Authors' contributions

This work was carried out in collaboration between all authors. Author UA is responsible for the coordination of the overall study including study design and collaboration between all authors, data analysis, manuscript preparation and initial draft of the manuscript. Authors HML and AMM managed the analyses of the study and the literature searches. Authors EOO and SMI assisted with manuscript review, and study design.

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Case Report

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ABSTRACT

In developing countries like ours, patients with End Stage Renal Disease present late requiring urgent haemodialysis. The femoral vein is commonly used in this situation, as access is easier and faster with few complications. Few cases of catheter fracture and migration have been reported. We aim at reporting a case of 26-year-old woman who presented with bilateral venous femoral catheters fracture and migration. Both were successfully removed via bilateral groin exploration and venotomy. We recommend early removal in order to avert life-threatening complications.

Keywords: Femoral catheters; fracture; migration and haemodialysis.

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1. INTRODUCTION

Catheter embolization is the term generally applied to catheter fragments that embolize to various locations including pulmonary arteries. The nature of catheter embolization has changed over the years. Initially only seriously ill patients received central venous catheterization usually in the critical care set up and were susceptible to catheter emboli, but nowadays population at risk has grown considerably because of use of central venous catheters in the long term parenteral nutrition, blood sampling, delivery of chemotherapeutic agents for cancer and for maintenance hemodialysis in chronic renal failure patients [1]. In patients requiring urgent haemodialysis, catheters are commonly used for temporary venous access [2]. Femoral venous access has become the commonest route of haemodialysis in Nigeria as patients with end-stage renal disease usually present to the clinician in the emergency setting at a time elective creation of venous access is not possible [3,4]. We present a case of bilateral femoral catheters fracture and migration with review of literature.

2. CASE REPORT

A 26-year-old housewife with end stage renal disease who has been on haemodialysis was referred to our hospital from a peripheral hospital on account of one-month history of fracture and migration of left femoral dialysis catheter. This was confirmed by the nurse on duty following a complaint by the patient of disappearance of the catheter that was inserted in her left groin. An attempt at retrieval of a small fragment sticking out at the insertion site was abortive. A week later, a right femoral catheter was inserted when the patient was due for another session of haemodialysis, which also fractured and migrated. A right subclavian venous catheter was inserted for the continuation of her haemodialysis thereafter. A pelvic x-ray at the peripheral hospital reported two radio-opaque objects in the pelvic brim. This warranted referral to our institution.

At presentation, she was stable except for bilateral pitting pedal oedema and ascites. She had a session of haemodialysis via a right subclavian venous catheter. A repeat X-ray of the pelvis revealed two tubular structures projecting over the femoral heads bilaterally which extended superiorly over the pelvic cavity and over the sacro-iliac joints laterally. These

were femoral cannulae in the course of femoral veins. See Fig. 1.

She had bilateral groin exploration under spinal anaesthesia. Intra-operative findings were marked fibrosis around the regions of both femoral veins and thickening of the walls of the veins. Access to the common femoral veins was gained proximal to the point of cannulation and the veins were looped and snared to prevent further migration during manipulation for removal. Transverse venotomies were made around the most caudal ends of the cannulae and these were retrieved. Venotomies were closed with prolene 6/0 and wound was closed in layers (See Figs. 2, 3, 4 and 5). Patient was given intravenous antibiotics and analgesics and subcutaneous low molecular weight heparin (clexane^R). Postoperative recovery was uneventful and patient was discharged on the 5th day postoperative.

3. DISCUSSION

Peripherally inserted temporary haemodialysis catheters are commonly used in patients with end stage renal failure requiring urgent haemodialysis. The femoral vein is preferred when rapid access is needed for logistic reasons. Insertion is relatively easy, complications are rare and treatment can be started without delay [2]. Even though complications are rare, some authors have however reported complications such as bacteremia, mechanical failure or rupture and venous thrombosis [5]. There have been some reports of unilateral femoral vein catheter fracture and migration in literature [1,2]. Our patient however, had fracture and migration of the catheter on the left side, a week later she had another catheter inserted on the right side for her next session of haemodialysis, which also fractured and migrated. To the best of our search, this is the first report of bilateral femoral catheter fracture and migration. In developing countries like ours, diagnosis of ESRD is made late because of ignorance on the part of the patients as most would have patronized drug vendors for symptomatic treatment of renal symptoms, lack of a system that will identify these patients early and refer to the appropriate specialists. Payment of medical bills in Nigeria is through "out of pocket" expenditures, where an individual pays from his pocket at the time he presents to the hospital. National Health Insurance Scheme (NHIS) does not cover dialysis. The cost of a session of haemodialysis is estimated at \$160 [6]. These factors

discourage patients from coming to the hospital early. As a result, most patients with End Stage Renal Disease present late, usually at the time they require urgent dialysis. The United States Institute of Medicine has recommended that female patients with chronic kidney disease should be referred to a nephrologist for initial consultation when their serum creatinine is 1.5mg/dl and male patients should be referred when their serum creatinine is 2.0mg/dl [7]. Patient with GFR of less than 60ml/min should also be referred to the nephrologist for management. However, in developing countries like Nigeria, late referral is very common. Patients are usually referred to the nephrologist when they have stage 4 or 5 chronic kidney disease, and in most cases with features of uremia [8]. All the above-mentioned factors force doctors in developing countries like ours to insert a femoral venous catheter for urgent dialysis. Late referral, cost and few skilled surgeons in the art of AV fistular creation are some of the factors that contribute in the use of

temporary form of vascular access. Again, late referral for renal care does not allow for the several weeks that are necessary for the maturation of AV fistula before use even if they are created. Bamgbose et al. [9] in southern part of Nigeria reported the distribution of vascular access among their patients as follow; femoral catheters 35%, arterovenous fistula 29%, subclavian catheters 22%, internal jugular catheters 8% and 6% for arteriovenous graft. The use of femoral catheters is said to be higher even in bigger centres in Nigeria [10]. Arodiwe et al. [3] in southeastern part of Nigeria compared vascular access in a developing country (Nigeria) and developed country (USA). They reported femoral cannulation as the commonest type of vascular access (93.6%) while left hand arteriovenous graft as the commonest in Texas USA (34.6%). From the above, one can see why it's almost inevitable in some circumstances to insert a femoral venous catheter for haemodialysis in developing countries.

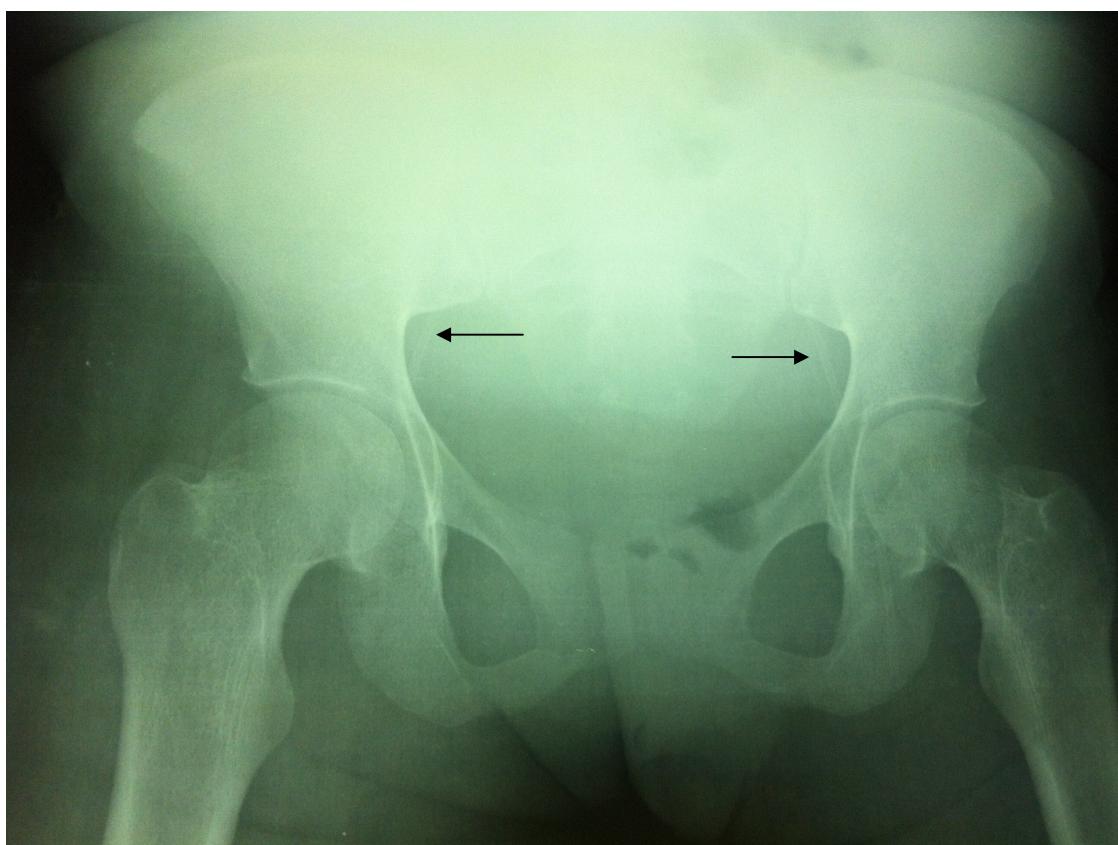


Fig. 1. Plain radiograph of the pelvis, arrows showing the catheters

Our patient presented first of all to a peripheral hospital where she was cannulated for dialysis via her left femoral vein. The catheter fractured and migrated proximally but due to probably inexperience of the attending physician, an attempt was made which was abortive. This patient should have been referred at that stage, instead the right femoral vein was again cannulated which also fractured and migrated. This raises some questions about the competence of the physician, a medical officer without any form of formal training in vascular access and management of complication arising from this procedure. This is the case in most developing countries³. Femoral catheters are inserted for short-term use and usually patients remain in the hospital during that period. Our patient was in the hospital during that period because of her poor clinical state but was ambulating with the femoral catheter. The process of flexion and extension of the hip joint can weaken the catheter and lead to fracture.

The catheter in question is single lumen 14GA x

13.3cm ($5\frac{1}{4}$ inches) straight Medcomp^R. We were not able to verify the manufacturing and expiry dates. If they had expired, then it was possible for the catheters to have fractured. Many developing countries are fraught with substandard medical supplies, which are usually cheap and most at times fake [11]. This may also explain why this complication can occur.

Our patient had groin exploration and removal of the catheters, which is what is advocated by some authors [1,2]. She had fibrosis in the region of both femoral veins because of repeated cannulation for dialysis. This also goes to show the limited experience of the managing physician in terms of temporary vascular access. Percutaneous retrieval of venous catheters has been reported with good outcome [12,13]. In our environment, the facilities and expertise for percutaneous retrieval are lacking and this leaves us with the open method of retrieval as in this index patient.



Fig. 2. Left femoral catheter at the time of removal



Fig. 3. right femoral catheter at the time of removal



Fig. 4. Immediate postoperative photograph



Fig. 5. Catheters after removal

Various complication of catheter embolization like transient arrhythmias, sepsis, thrombus on the catheter, pulmonary emboli, arrhythmias, myocardial inflammation and even death have been reported [1,14,15]. Our patient is peculiar because at the time of presentation, she had two migrated femoral venous catheters lodged in her

common femoral veins with a higher risk of embolization compared to single catheter.

4. CONCLUSION

Bilateral venous femoral haemodialysis catheter fracture and migration is an uncommon

complication of emergency access for haemodialysis in the hands of poorly trained medical personnel managing patients with end-stage renal disease in developing countries. Proper training and use of standard catheters may prevent this complication.

CONSENT

All authors have declared that written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

Not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Singh S, Prakash J, Shukla VK, Sharatchandra LKS. Intravenous catheter associated complications. *J Assoc Physicians India*. 2010;58:194-6.
2. Seth S, Seth S, Kumar P, Agarwal N. A case report on the management of a broken haemodialysis catheter in the femoral vein. *Int J Med Sci Public Health*. 2014;3:(Online First). DOI: 10.5455/ijmsph.2014.080420141
3. Arodiwe E, Eze J. comparative analysis for haemodialysis in End Stage Renal Diseases in developing and developed country. *Internet Journal of third World Country*. 2012;10(1).
4. Bello BT, Raji YR, Sanusi I, Braimoh RW, Amira OC, Mabayoje OM. Challenges in providing haemodialysis in a resource poor country: Experience from a single teaching hospital in Lagos, southwest Nigeria. *Haemodialysis International*. 2013;17(3): 427-433.
5. Merrell SW, Peatross BG, Grossman MD, Sullivan JJ, Harker WG. Peripherally inserted central venous catheters. Low – risk alternatives for ongoing venous access. *West J Med*. 1994;160(1):25-30.
6. Ekrikpo, et al. Haemodialysis in an emerging centre in a developing country: A two year review and predictors of mortality. *BMC Nephrology*. 2011;12:50.
7. Wish JB. Management of patient with progressive renal failure. *Nephrology Secrets*, 2nd Edition. Editors, Hricik DE, Miller RT, Sedor JR. Elsevier India. Chapter 45: Page 171.
8. Rodriguez JA, Armadans L, Ferrer E, et al. The function of permanent vascular access. *Nephrol Dial Transplant*. 2000;15:402-408.
9. Bamgbose EL. Haemodialysis: Management problems in developing countries, with Nigeria as a surrogate. *Kidney international*. 2003;63(83):93-95.
10. Ayo A. Problems of haemodialysis in the management of chronic renal failure in Ibadan. *Arch Ibadan Med*. 2001;2:14–16.
11. Obansa SAJ. Healthcare financing in Nigeria: Prospects and challenges. *Mediterranean Journal of Social Sciences*. 2013;4(1):221-236
12. Ragiv L, Shivprakash, Vijay S, Shio P, Durgaprasad R, Amit K. Percutaneous endovascular retrieval of intravenous catheter fragment. *International Journal of Ultrasound and Applied Technologies in Perioperative Care*. 2010;1(2):127-129.
13. Andreas G, Stefan K, Johannes G. Percutaneous retrieval of lost or misplaced intravascular objects. *AJR*. 2001;179:1509-1513.
14. Propp DA, Cline D, Hennenfent BR. Catheter embolism. *J Emerg Med*. 1988;6(1):17-21
15. Graham KJ, Barratt-Boyes BG, Cole DS. Catheter emboli to the heart and pulmonary artery. *Br Surg*. 1970;57:184-86.

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