The Missing Tail: An Iatrogenic In-Situ Peripheral Intravenous Catheter Fracture

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Abstract—Securing a peripheral venous line is one of the most common procedures employed in the hospital settings. Despite being an easier task and a routine practice, if not done correctly may lead to dire consequences. The present case revolves around a 40 years old male, admitted in the super specialty wing of the tertiary health care hospital & who was explored locally for the retained fragment of the peripheral venous catheter when the attending nurse while removing the venous catheter noticed its absent tail. The missing fragment was identified in cephalic vein of the left arm during the ultrasonography. Immediately after imaging, patient was shifted to minor operation theatre where the retained fragment was extracted out under local anaesthesia by doing venotomy under the supervision of a vascular surgeon. Such routine procedures constitute an important part of the health care delivery system and as such there are no specific guidelines about performing these procedures and ultimately because of the lack of the knowledge and awareness about the methodologies regarding these procedures among the junior hospital staff such mishaps may occur due to the iatrogenic or unavoidable circumstances. The present case is an ideal example about the factors & unavoidable circumstances leading to the peripheral venous catheter fracture and how such unfortunate events can be prevented. Through this case, author tend to convey the importance of guide needle during cannulation and whose reinsertion again & again during failed multiple attempts of cannulation might lead to such consequences. And proper counselling, awareness & education of the junior hospital staff including patients & their attendants about these rare devastating implications of such routine procedures and the ultimate remedies available.

Index Terms—Venotomy, Day Care Procedure, Cephalic Vein, Peripheral Intravenous Catheter, Iatrogenic Complication.

I. INTRODUCTION

Securing a peripheral venous line is the foremost and the easier routine task done after the admission in the hospital settings. Despite being an easier task, it is may be associated with many complications like swelling & inflammation around the puncture site, injury to the neighbouring vasculature & nerves, hematoma formation post puncture, extravascular infiltration if intravenous peripheral cannula line not secured correctly, associated thrombophlebitis, cellulitis & sepsis if kept for long & in rare cases embolism [1]. Fracture of the peripheral intravenous catheter/cannula (PIVC) is an underreported complication of peripheral intravenous (PIV) cannula placement [2] and these life-threatening mishaps related to the same procedure because of the iatrogenic or unavoidable circumstances have been rarely reported [3]. And especially in Indian scenario there are hardly any case reports available in this context. Through this case, author tend to convey the importance of guide needle puncturing the catheter during cannulation following multiple failed attempts. Including the proper counselling, awareness & education about such routine procedures and how such mishaps can be prevented.

II. CASE PRESENTATION

A 40 years old male, admitted in the super specialty wing of the tertiary health care hospital was explored locally for the retained fragment of the peripheral venous catheter when the attending nurse while removing the venous catheter noticed its absent tail as the patient was planned for discharge on the same day. As soon as she noticed this, she immediately called the resident on duty. Patient had stable vitals but during the local examination there were overlying skin changes, the broken fragment was palpable in the left cubital fossa as well as induration was present locoregionally. Without a second thought, a tourniquet was tied in the proximal region of the same arm in order to prevent the dislodgement of the broken fragment/tail to the other vital sites. The missing fragment was identified in the cephalic vein of the left arm during the ultrasonography. Thereafter, patient was shifted to minor operation theatre where the retained fragment of the peripheral venous catheter was extracted out under the local anaesthesia as seen in Fig.1 where a 1.5 cm long fractured tail/fragment of the peripheral venous catheter had been extracted & removed after local exploration & venotomy done under the supervision of a vascular surgeon. There after the explored local site
was sutured as seen in Fig. 2 using interrupted suturing technique for the wound closure under aseptic conditions. Patient was kept under the observation for 2 more days and was subsequently discharged from the hospital when the course during the hospital stay was uneventful.

**Figures**

**Fig. 1:** A 1.5 cm long extracted fractured fragment/tail of the venous catheter after doing local exploration & venotomy.

**Fig. 2:** Suturing of the local incision site done after the extraction & removal of the fractured catheter tail/fragment in situ.

**III. DISCUSSION**

Such routine procedures constitute an important part of the health care delivery system and as such there are no specific guidelines regarding these procedures and ultimately because of the lack of the knowledge about the methodologies regarding these procedures among the junior hospital staff such iatrogenic 2 of 3 mishaps may occur during cannula placement or removal [4]. Other causes associated with it may include poor cannulation techniques by the beginners doing such procedures unsupervised, low-quality cannulas/catheters, reinsertion of guide needle again & again during failed multiple attempts or cannula that has not been changed for long in the chronically ill patients [5]. Understanding the concept that multiple failed attempts using same cannula should be discouraged on a very serious note, such procedures should be done under the supervision of the senior hospital staff and in case of emergency if junior hospital staff is not able to secure peripheral line or if they notice such discrepancies in the cannula size during its removal then call for help should be given to the senior hospital staff as seen in this
case. The present case emphasizes on the safer cannulation practices by the clinicians and adequate counselling of the patient about the rare implications of such routine procedures.

IV. CONCLUSION

If the present case is taken into the consideration, such mishaps whether iatrogenic or due to any other unavoidable circumstances lead to the additional costs and prolonged length of hospital stay which can be easily avoided. As initially the same patient had to undergo x-ray, then ultrasonography and there after local exploration & venotomy in the operation theatre adding more to the hospital charges. Per contra if the same broken fragment would have been lodged elsewhere in the body, then same patient would have been subjected to a much expensive CT scan and emergency surgeries that might have included thoracotomy in rare case scenarios. It is very important to remain adhered to the strict protocols and methodologies employed in these day-to-day routine procedures as inefficiency or carelessness done while performing such procedures that too unsupervised may land the patient in such devastating consequences. The root cause for the fracture of venous catheter is the reinsertion of the guide needle again & again during the multiple failed attempts of securing a peripheral line which punctures the tail of the catheter and it goes unnoticed. Such practices should be discouraged on a very serious note and new catheter should be used if puncture of the catheter's tail occurs before it's insertion into the blood vessel. Other causes may include the prolonged placement of the catheter and under such circumstances venous catheter should be changed periodically in order to prevent these life-threatening consequences. And if such events occur and before the exploration is planned, a temporary tourniquet should be tied proximal to the suspected site in order to minimize the likelihood of the embolism even if same is not visualized on radiography or palpated. In order to prevent such mishaps multiple cannulation attempts should be discouraged and both patients and the junior hospital staff should be made well aware about the devastating implications of such routine and not so easy procedures.

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