

Fracture of Peripheral Line during Removal in an Orthopedic Case

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Abstract

Peripheral intravenous cannulation is a routine simple procedure. However, it is associated with complications if not done properly. Ultrasonography is one of the imaging modality to assess and confirm the broken fragment of IV cannula in setting of developing country.

Keywords: Peripheral vein • Blood • CT scan • Ultrasonography

Introduction

Peripheral intravenous cannula insertion is a very simple routine procedure done every day in a health setting by every health workers.

A peripheral intravenous cannula (PIVC) is a medical device that is inserted into a peripheral vein for the administration of fluids, blood, and medications [1].

We routinely use 18 or 20 G plastic cannula for Intravenous access in upper extremity venous system [2]. Most health workers don't realize complications associated with IV line insertion because it is a simple routine procedure. However, iatrogenic fracture of cannula in a hospital setting is not a rare thing. A fractured PIVC can lead to complications ranging from local site infection to limb loss and proximal embolization, which can cause fatal cardiac and pulmonary damage [3]. The first case of spontaneous fracture of intravenous cannula causing embolization was described by Turner et al., back in 1954 [1]. Localization of the fractured fragment is vital before initiating the removal. This can be achieved through clinical examination, and supported by imaging as necessary. There are some studies where CT guided localization of the retained fragment with removal but in a resource constrained setting, high-resolution ultrasonography is helpful.

Case Report

A 67 years old male patient was admitted at the orthopedic ward, ERRH, Mongar, Bhutan for a Closed Tibia Shaft Fracture of right leg. He underwent the closed reduction and internal fixation with intramedullary nail of right tibia. His Intravenous line into cubital vein was administered for preoperative and postoperative antibiotic and analgesic medication.

After completion of 72 hours postoperative period, IV line was ordered for removal. During the procedure of removal by the nurse on duty, only the proximal part of IV cannula came out, the distal part was still in the vein.

The remaining part of IV cannula could be palpated over the skin. Immediate ultrasound scan was ordered to confirm the location of the fractured

part in the vein. USG- revealed a fractured cannula in the cephalic vein over the cubital fossa. The patient party was made to understand the importance of immediate retrieval of the broken fragment, and explained its associated complication if delayed.

Under the sterile condition, local anesthesia was given, a longitudinal incision was made over the palpable site of skin and the cephalic vein was isolated. Venotomy was done and gentle retrieval of the cannula was done. Wound was sutured with 4.0 nylon and postoperative period was uneventful (Figures 1 and 2).



Figure 1. Showing the broken fragment of cannula removed which was kinked.



Figure 2. Demonstrating uneventful healing of incision site.

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Discussion

When performed properly, intravenous line insertion is a safe procedure [2]. There are several contributing factors which may lead to the fracture of IV cannula:

- 1) Improper technique of IV line insertion contrary to its protocol
- 2) Prolonged duration of IV line in situ
- 3) Poor IV line care by both the patient and health worker
- 4) Inferior quality of IV cannula
- 5) IV line over the joints where it is constantly kinked with range of motion

In an orthopedic setting patients need early passive and active range of motion. Therefore, IV line over joints or near to joints invariably fails due to constant pressure caused by motion. When broken, it necessitates immediate removal because of the complications associated with it. A paper by Dr Lundgren and the team in their study over the care and handling of peripheral IV line of 60 cases concluded that 52% of cases were unsatisfactory to very unsatisfactory [4].

Conclusion

Even though intravenous line is a simple routine procedure, health workers

should be aware the risks/ complications associated with it. Adhering with universal guideline and certain precautions could minimize the complications. Immediate removal of the broken fragment is vital to prevent further complications. Ultrasonography is another imaging modality besides CT scan for confirmation and localization for the broken fragment in a resource-constrained country like Bhutan.

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