

The disappearing peripheral venous cannula

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Introduction

Insertion of a peripheral venous cannula is a one of the most routine procedures for patients admitted to hospital for a significant medical condition. These are often placed around the wrist or elbow. Complications following central venous catheterisation are well documented in the literature unlike those associated with peripheral venous cannulation. These are mostly related to local thrombophlebitis and rarely cause severe systemic complications¹.

We present a case of an unusual complication which to our knowledge has not been previously documented - a possible retained fragment of a peripheral venous cannula.

Case Report

A 16 year old boy was admitted with typical clinical symptoms and signs of septic arthritis involving his right knee. He underwent an emergency arthroscopic washout of his knee and was commenced on intravenous antibiotics. This was administered through an 18 gauge peripheral venous cannula, placed in his left distal forearm, overlying the wrist. The peripheral venous cannula was removed five days later as he was changed to oral antibiotics. His joint fluid cultures were negative and he was discharged on the sixth post operative day.

Two weeks later when reviewed in the clinic he complained of pain, redness and a foreign body sensation in his left distal forearm. Physical examination by a senior registrar and the consultant revealed a palpable, tender, linear subcutaneous firm foreign body, corresponding to the original site of venous cannulation. The possibility of a retained fragmented peripheral venous cannula was considered and appropriate imaging arranged.

Radiographs of his left distal forearm and wrist regions revealed a 2-3 cm linear foreign body in the subcutaneous plane (Figure 1).

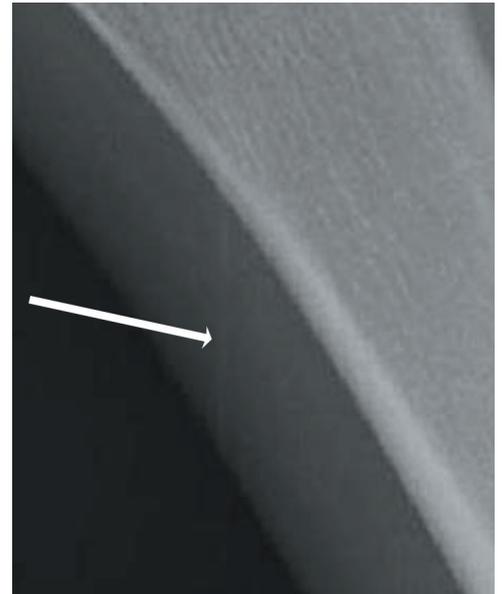


Figure 1.

Ultrasound of the region (Figure 2) confirmed a tubular subcutaneous foreign body lying within a vessel.

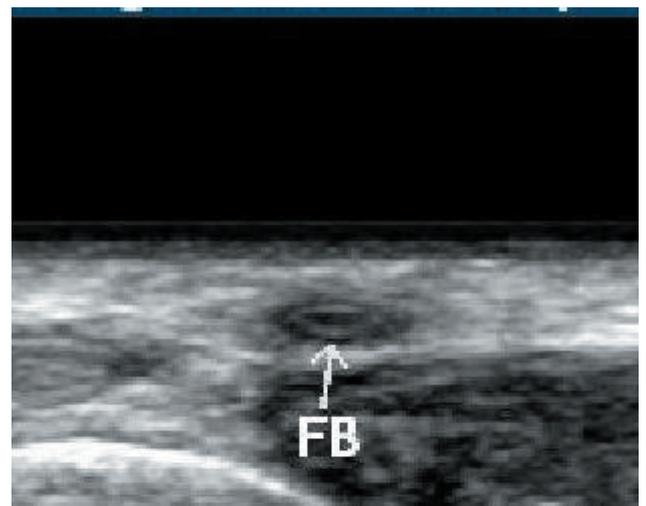


Figure 2.

After informed consent the forearm vein was explored under general anaesthesia. A proximal arm tourniquet was applied without exsanguination. The vein was ligated proximal to the palpable foreign body and laid open in length distally. To our surprise no cannula or its remnants were found.

At a subsequent out patient review two weeks later, the patient neither had any symptoms nor was there a palpable foreign body in his affected forearm. Both parents and the patient did not want to pursue things any further at this stage. They collectively declined any further investigation.

Discussion

We are still unable to explain the disappearance of this peripheral venous cannula – assuming it was there in the first place. The report raises some important issues as discussed below.

Was the cannula ever there? We believe there must have been a linear foreign body both on clinical and radiological grounds. The absence of the foreign body at surgical exploration raises the possibility of the palpated structure being a thrombosed vein rather than a fragmented venous cannula, but this could not explain the radiological results.

Did the cannula break? No instance of fragmentation of a peripheral venous cannula has been reported before. However, the weakest portion of a peripheral venous cannula once sited is the junction between the body and the plastic shaft. This junction is liable to break if the cannula is retained for longer than the recommended period of three days or it overlies a joint⁹. If the cannula had broken in our case, the combination of the above two predisposing factors may have rendered the cannula weak.

Was the remnant cannula left behind? There was no documentation of problems in relation to removal of the cannula in the notes. Clear documentation of the cannula being removed intact would have been helpful. The importance of documentation of fine but relevant details cannot be over emphasised.

Did the cannula migrate? The only incidence of a peripheral cannula migration that is reported comes when a peripheral cannula cut sheath was used as a means of inserting a central cannula in a child³. The complication in this case was fatal hemopericardium and tamponade. Cannula tip migration is a well known phenomenon observed in cases of central venous cannulation. Common causes of migration are catheter fragmentation, migration secondary to movement of upper limbs or neck² and accidental division of the catheter³. Postulated causes of spontaneous fragmentation of central venous cannula are manufacturing defects, mechanical trauma, material degradation caused by fluids or chemicals injected using the cannula, fibrotic adhesions, and resistance to removal. Numerous complications following such migration have been documented. These include migration to the internal jugular vein⁴, pulmonary artery right cardiac chambers^{5,6} causing pericardial effusion and cardiac tamponade⁷. Migrated venous catheters have also caused Horner's syndrome⁸, hydro mediastinum and hydrothorax⁸, and cardiac arrhythmias including ventricular tachycardia.

Fortunately, our patient did not have any symptoms relating to a possible migration. Investigations such as ECHO or angiography may have been warranted if this was the case. In the absence of further symptoms, we as a team felt further investigations would not only subject the patient to unnecessary risk but also result in waste of valuable resources.

Conclusion

Peripheral venous cannula fragmentation and migration is rare but can cause serious complications. The cannula has a potential to break at the weak junction. Placement over joints with frequent use and retention in situ for longer than the recommended period are well known predisposing factors for such breakage.

Use of good quality cannulas, retaining them only for the recommended period, and clear documentation at removal can avoid serious consequences. These simple but effective measures can save precious time and valuable NHS resources.

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