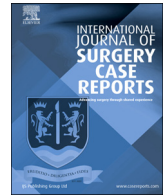




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Case report: Iatrogenic fracture of intravenous cannula during removal with proximal migration

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ABSTRACT

INTRODUCTION: We report a case of iatrogenic fracture of peripheral intravenous cannula in the cephalic vein with proximal migration. It is extremely rare and underreported complication of peripheral intravenous cannulation. It acts as a retained intravascular foreign body with lethal complications.

PRESENTATION OF CASE: In this case report we conceded that a 23 year-old Hindu female presented to us with pain and discomfort at the site of cannulation in the mid forearm and just over the cubital fossa. The localisation of the fractured cannula was reconfirmed with imaging techniques, venotomy and gentle retrieval of intravascular foreign body was performed.

DISCUSSION: When performed properly peripheral intravenous cannulation is a safe procedure with little serious risks. It can cause many lethal complications. Such complications can be avoided by adhering to universal guide lines of IV cannulation. Early localisation and exploration for retrieval should be the treatment of choice.

CONCLUSION: A fractured peripheral intravenous cannula has potentially devastating consequences. Early detection and the standard operating procedure of peripheral venous access, and meticulous teamwork must be adopted.

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1. Introduction

Foreign bodies are commonly found lodged in the narrow body cavities like nose, ear, cricopharynx and rectum. Foreign bodies are more common in children. Iatrogenic foreign bodies are common like artery forceps, sponges, scissors or other instruments left accidentally in side body cavity; which lead to life threatening complications and its legal consequences. Intravenous foreign bodies are a rare occurrence in adults. We routinely use 18 or 20G plastic cannula for Intravenous access in upper extremity venous system. The placement of Intravenous cannula is invasive but is a benign part of daily clinical practices. Complications like infiltration, migration, thrombophlebitis, haematoma, venous spasm, air embolism [1] infection & nerve, tendon and ligament injury may occur. We introduce a case of fractured migrated Intravenous cannula in the Cephalic vein during removal [2]. The case report is in line with SCARE criteria [6].

2. Historical background

In 1957 Sir Christopher Wren invented the first instrument for Intravenous Therapy. A cannula made from quill of a bird feather which was used to inject drugs into veins of a dog. In 1952, the French Military Surgeon Robert Aubaniac described the uses of percutaneously placed subclavian vein catheter for rapid infusion of resuscitative fluid in military casualties.

3. Case report

A 23 year Hindu female reported to Out Door Patient Department with history of Intravenous cannulation in left mid forearm during caesarean section. She had pain and discomfort at the site of cannulation (mid forearm) and just over the cubital fossa. Intravenous cannula was broken during removal [2] and left inside. Clinical examination revealed a firm, tender linear cord like palpable structure over cubital fossa. X-Rays of forearm [Fig. 2: Inconclusive: Showing No IV cannula] done, but was inconclusive, as Intravenous cannula does not have radio opaque substance. High Resolution Ultrasonography [Fig. 1: HSUSG: Showing IV Cannula in cephalic vein] showed fractured Intravenous cannula in the cephalic vein just over cubital fossa. Diagnosis of fractured Intravenous cannula was confirmed.

Under sterile condition with transverse incision, cephalic vein was isolated from its surrounding structures. Venotomy and gentle

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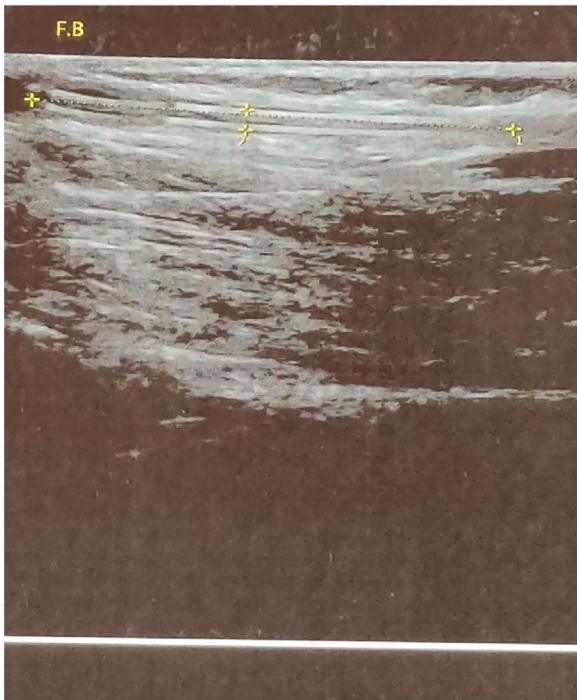


Fig. 1.

retrieval of Intravenous cannula was performed from cephalic vein [Fig. 4: Exploration under Local Anesthesia (Steps of operation)]. Post postoperative period was uneventful. Stitches were removed on 10th day. Patient is under regular follow up.

4. Discussion

When performed properly, peripheral Intravenous placement is a safe procedure with little serious risks. Reports related to



Fig. 3.

Intravenous cannula fracture in the literatures are related to central venous catheter with complications like sepsis, perforation, thrombosis, air embolism, dysrhythmia, pneumothorax and myocardial infarction. Turner et al. had reported the first case of an intravascular embolization of catheter fragment in 1954 as a complication of central venous catheterisation. A large number of complications have also been reported with peripheral venous cannulation like phlebitis, air embolism [1] extravasation of Intravenous fluids, bruising, haemtoma, bacteraemia, skin necrosis, compartment syndrome, venous aneurysm, nerve, tendon and artery injury.

Spontaneous fracture and migration of Intravenous cannula is a rare but known complication described by Turner et al. in 1954. In our case Intravenous cannula migrated from mid forearm to cubital fossa about 10cm distance [Fig. 3: Depicting Migration

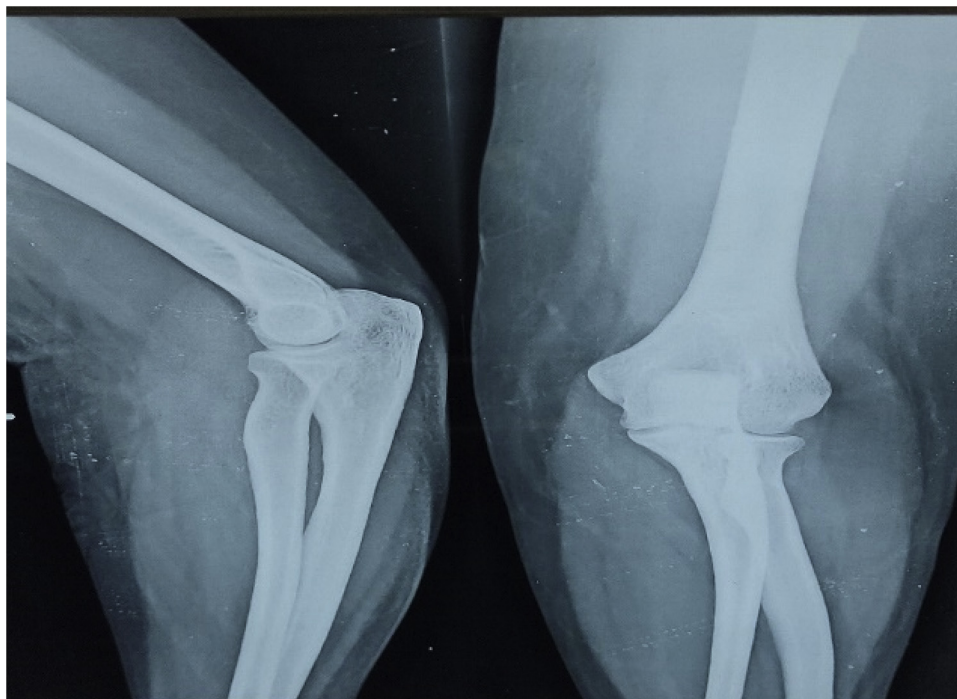


Fig. 2.

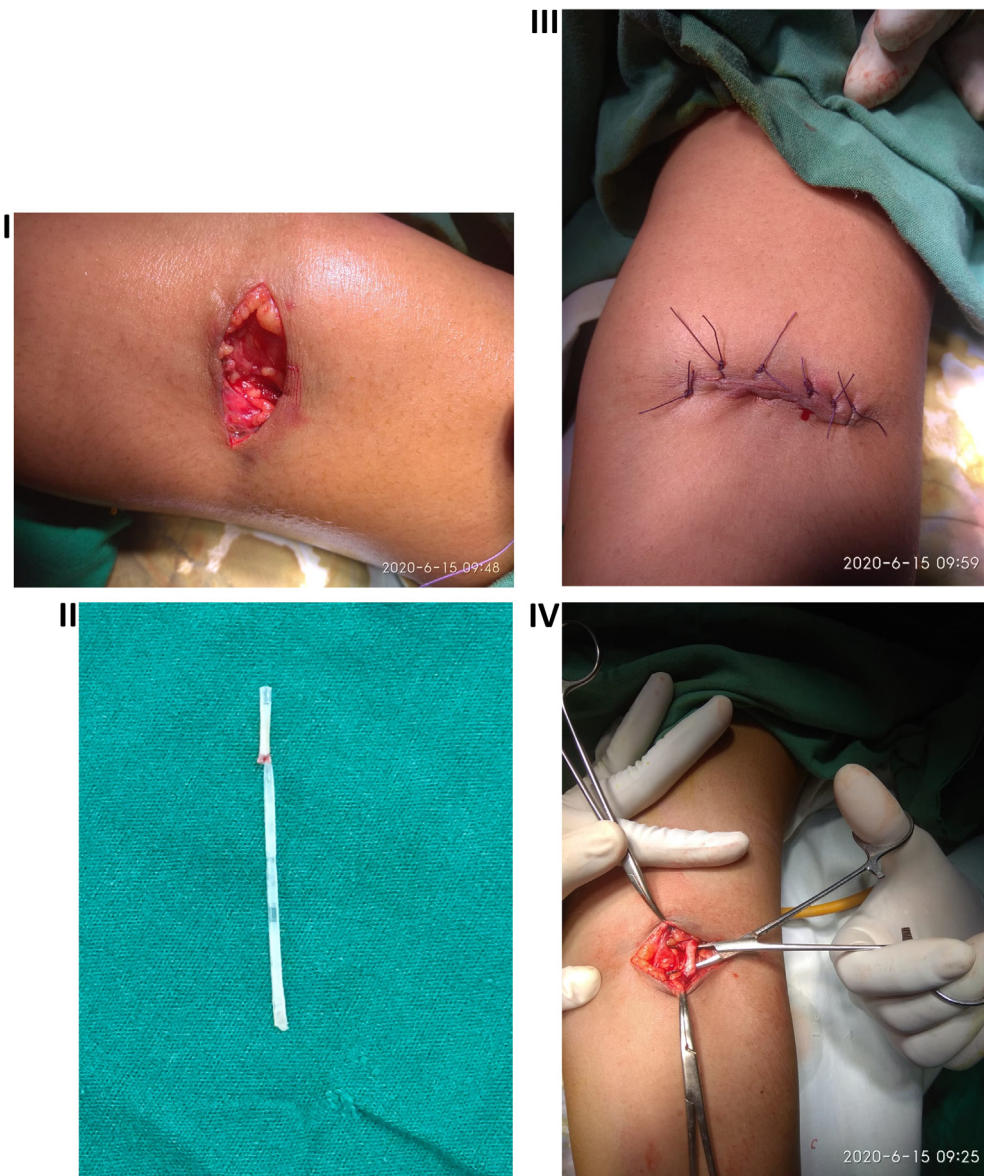


Fig. 4.

of IV Cannula vein (10 cm)]. Risks can be reduced by exercising guidelines, avoiding repeated attempt with same cannula, avoiding lower extremity Intravenous cannulation, minimising cannula movement and removing cannula as soon as possible. Intravenous cannulation in emergency situation is more prone to complications. Overall incidence of Intravenous cannula fracture has increased due to both diagnostic and therapeutic procedures and widespread use of percutaneous embolization. Management of this case proceeds with early clinical diagnosis with imaging techniques like High Resolution Ultrasonography (Fig. 1) and CT Scan. Surgical retrieval of Intravenous foreign body should be performed under anaesthesia, careful dissection, isolation, identification, venotomy and then gentle retrieval of foreign body. CT guided percutaneous retrieval [4] has also been reported in the literatures. Surgeons should know the possibility of extravascular migration of foreign body into the surrounding tissues. Interventional radiology, a minimal invasive method of intravascular foreign body retrieval [3,5] is a viable and safe options. However, its use is restricted due to cost and non-availability, exclusive of higher centre.

5. Conclusion

Intravascular retention and migration of fractured cannula is a complication of a common procedure. It should be removed with care and confirm that it is removed in its entire length. If broken during removal, it may cause serious complication. Therefore, use of imaging techniques are essential before and during exploration for retrieval. Such complications can be avoided by adhering to universal guide lines. Early exploration after localisation should be the treatment of choice.

“A Stich in Time Saves Nine”

Declaration of Competing Interest

We don't have any conflicts of interest, nor we have any financial or personal relation with other people.

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There is no source of funding in the preparation of manuscript for publication.

Ethical approval

Ethical approval has been exempted by our institution as this is a case report and not a randomized trial or case series. The patient gave her written consent both for operation and the publication of this case.

Consent

We have obtained fully informed written consent from the patient to publish this case report.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

RajRanjan Kumar is the main author and corresponding author of this paper.

Prachi Ranjan participated in the writing of this paper. All authors read and approved the final manuscript.

Registration of research studies

N/A.

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