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Case Report

Retrieval of retained fractured intravenous cannula of external jugular vein: a rare report

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ABSTRACT

Intravenous cannulation is most common invasive procedure often performed by nursing officers and junior colleagues in the emergency department. Peripheral venous route of upper limb is often preferred over neck venous route. Even though it is a simple routine invasive procedure it can lead to extravascular infiltration, double puncture of vessel walls, thrombophlebitis, hematoma, catheter associated blood stream infections, trauma to surrounding structures like tendon, nerve injuries and air embolism. Fracture of neck intra venous (external jugular vein) cannula in situ is rare and it can cause serious complications if it is neglected. It acts as a retained intravascular foreign body with lethal complications. Hence, the quality of manufacturing of cannula and proper training and technique can prevent potential complications associated with peripheral cannulation. We report a rare case of fractured and slightly migrated intravenous cannula of external jugular vein (EJV) during cannula removal and successfully removed from the EJV under local anesthesia.

Keywords: Intravenous cannula, External jugular vein, Cannula fracture, Ultrasound, Health care givers

INTRODUCTION

Peripheral intravenous (IV) cannulation is a common medical procedure used to establish venous access for administering fluids, medications, and for drawing blood.[1] The procedure involves inserting a sterile cannula (a small, flexible tube) into a peripheral vein, typically in the arm or hand, using a needle. After successful insertion, the cannula is secured with a dressing to prevent dislodgement, and its patency is checked periodically to ensure proper function. This technique requires skill and practice to minimize complications such as infection, phlebitis, or inadvertent arterial puncture, hematoma formation, catheter associated infections.[2] The more serious complications like dysrhythmia and myocardial infarction, which can occur secondary to proximal embolization of the retained fractured segment into the central venous system.[3] Hence, early diagnosis and detection of the retained fractured cannula fragment and its subsequent removal are very important in preventing embolization and potential complications. Prior to surgical retrieval of retained fractured segment of intravenous cannula, the radiological investigations like X-ray, ultrasound and C-arm fluoroscopy during retrieval helps in identification site of retained cannula.[4] We present one rare case of fractured retained external jugular vein cannula retrieved successfully under local anaesthesia.

CASE REPORT

A 67-year-old female patient was admitted under general medicine department in intensive care unit (ICU), with hypertensive pulmonary edema, type 2 diabetes mellitus, chronic kidney disease stage 4-diabetic kidney disease, diabetic retinopathy, thoraco-lumbar vertebral fracture and kept on conservative management. On the day of admission, Patient was catheterized in left external jugular vein (EJV) with 18 G cannula, due to failure to secure peripheral line in both upper limb and lower limb. On day 4 of admission, removal of cannula was attempted as she

developed features of phlebitis at cannula site. While removing the cannula, the nurse noticed fracture of the cannula. Then the patient was referred to general surgery department, for fracture of 18 G cannula in left EJV. On clinical examination over left side of the neck, skin was erythematous, tender and cannula was palpable. We confirmed the position of the fractured cannula with ultrasound imaging (Figure 1a) for any migration. It was situated in the left side of the neck, within the EJV. We then advised for emergency exploration and removal of fractured catheter under GA. As the patient was high risk for GA, proper content was taken and successful removal of cannula was done under local anaesthesia. The procedure went uneventful. Patient was hemodynamically stable and discharged.

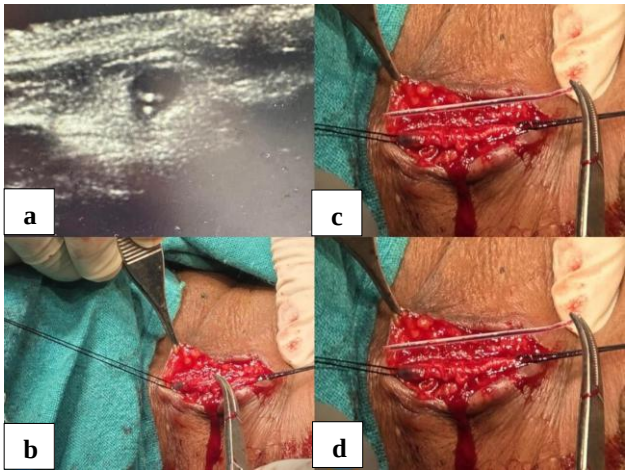

Figure 1: (a) Ultrasound showing hyper enhanced intraluminal foreign body present in the left EJV, (b) showing intraluminal cannula removal, and (c) and (d) showing after removal of IV cannula.

DISCUSSION

External jugular vein cannulation is often used when peripheral access is difficult.[5] The EJV route is used for emergency fluid resuscitation or medication administration. It is also used for central venous pressure monitoring. EJV access is preferred in children commonly. The procedure of cannula insertion in external jugular vein is require experienced health staff. The bigger size cannula is generally used for cannulation. Usually imaging (ultrasound) guided cannulation is preferred in neck vessels. The procedure itself has few complications like pneumothorax, arterial punctures and cannula fracture.

The cannula is like soft plastic tubing made up of teflon, polyurethane, polyvinyl chloride, or polyethylene. The cannula is made up with polyurethane are flexible and having less chances of fracture.[6]

As in our index case even though we have used good quality cannula, got bent and broken in the EJV. Hence, the proper care should be taken while inserting and removing the cannula. Repeated attempts and acute angulation, poor quality of IV cannulas, and inexperienced staff are some reasons for IV cannula breakage.

Again in our case, long standing angulation of cannula along with improper technique to remove the cannula likely cause for breakage of EJV cannula. Hence, the care givers and medical health staff should observe the cannula site every day in view of location of EJV cannula, which is more prone for kink and breakage.

As per some previous reports by Singh et al, the patient had to be readmitted 15 days after discharge for exploration, following phlebitis development.[7] In another report by Dell'Amore et al, a fragment migrated from the median cubital vein to the sub-segmental pulmonary artery that required mini-thoracotomy after two months.[8] Turner et al had reported the first case of an intravascular embolization of catheter fragments in 1954 as a complication of central venous catheterization.[9]

The identification of the exact site of fractured segment of cannula is done by using imaging modalities like X-ray, ultrasound Doppler and contrast computed tomography (CT) scan. The decision to extract fractured segment of cannula is individualized depending upon exact the location of cannula. Imaging assisted procedure is preferred for exaction of cannula segment.

CONCLUSION

In conclusion, even though this procedure seems to be a simple procedure, it can cause potential complications. Hence, Proper training of health care worker and technique of insertion and can prevent potential complications associated with peripheral cannulation. Healthcare providers should daily check of proper functioning of IV cannula and local signs of phlebitis.

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