ORIGINAL RESEARCH PAPER
Volume - 9 | Issue - 8 | August - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

FRACTURED GUIDEWIRE OF HAEMODIALYSIS CATHETER.

General Medicine

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ABSTRACT

Introduction: A number of complications have been reported during the insertion of a central venous catheter, including injury to adjacent major vessels, pneumothorax and bleeding. We hereby report a case of fractured guidewire during Seldinger technique and its successful retrieval. **Background:** even though loss of the guidewire and failure to remove the wire has been reported, fractured guidewire is a rarely reported complication of Seldinger technique for central venous catheter insertion.**Case:** Description: elderly female required haemodialysis for azotaemia and acidosis. Haemodialysis catheter insertion was done using Seldinger technique under ultrasound guidance. During procedure, guidewire fracture was noted and was successfully retrieved in Cath. Lab. **Clinical Significance:** This case reviews the literature of fractured guidewire and highlights the important steps in safe guidewire removal procedure.

KEYWORDS

CVC insertion, Seldinger technique, Guidewire complications

BACKGROUND:

Central venous catheter (CVC) is a common intervention in the intensive care unit (ICU). Usual indications for insertion are vasopressor use, as an access and for haemodialysis. Seldinger introduced an innovative technique of percutaneous vascular catheter placement1. This central venous access insertion technique is considered easy and safe. A number of complications can occur during the insertion of a central venous catheter, including injury to adjacent major vessels, pneumothorax and bleeding. Loss of the guidewire and failure to remove the wire has been reported. Fractured guidewire during Seldinger technique is rarely reported in literature.

We present a case, where a guidewire was accidently fractured and retained inside the vein during placement of a hemodialysis (HD) catheter through right Internal Jugular Vein.

Case:

Eighty five year old female, known diabetes mellitus, treated carcinoma breast, hypothyroidism presented to ED in unresponsive state. She required cardiopulmonary resuscitation and post return of spontaneous circulation (ROSC) was shifted to ICU. After initial hemodynamic stabilisation for cardiogenic shock (non-ST elevation myocardial infarction with low ejection fraction), she was weaned off vasopressor and the ventilator on day two. However, she developed acute kidney injury on baseline diabetic nephropathy. A decision for hemodialysis was made in view of azotemia and acidosis.

As a routine protocol, ultrasound screening was done for right internal jugular vein to rule out thrombus and anatomical variations. An Experienced Intensivist punctured right internal jugular vein under ultrasound guidance. After a successful venepuncture confirmed with aspiration, guidewire was inserted. Serial dilatation of the skin and subcutaneous tract was done. The skin was pierced with some difficulty. The dilatation was difficult owning to presence of subcutaneous fat. Triple lumen HD catheter was inserted with Seldinger technique over the guidewire. After insertion, when guidewire was taken out, resistance was felt. Operator noticed a jerk and instead of complete guidewire, a part of core and avulsed coils came out from within the catheter. It was recognised that the guidewire was broken. As a possible attempt to remove the remaining part of fractured guidewire, the HD catheter was also removed. After this attempt, X-ray chest was taken which revealed the broken residual fragment in internal jugular vein (Image 1). Patient was hemodynamically stable. A non-contrast CT thorax was done to identify exact location of fractured guidewire, probable migration and injury to adjacent structures (image 2). Relatives were explained the scenario and emergency retrieval procedure was planned in Cardiac Catherization Lab to remove the guidewire.

Procedure:

7F femoral sheath was inserted in right femoral vein. A snare was taken up to the lower pole of the embolised guidewire under fluoroscopy. After multiple failed attempts, Snare loop was entangled around the guidewire. And slowly, the embolised guidewire along with the snare was pulled out through the sheath. Repeat fluoroscopy check-shoot was done to rule out the remnants of guidewire if any. Procedure went uneventful (image 3).

After one day of stay in ICU, the patient was shifted to ward and discharged in next 10 days

DISCUSSION:

Even though, slipped and retained guidewires are commonly reported, broken guidewire is a rare but a serious complication that can happen during CVC cannulation.

Anwari et al reported one such incidence of a retained guidewire inside the CVC. The guidewire remained inside the body after removing the catheter. It was removed after a week 2. The guidewire can be easily viewed as a radio-opaque structure, but sometimes it's difficult to diagnose. Song Y et al. reported a case of guidewire retention which, after several failed attempts to diagnose with chest radiographs, incidentally, discovered on CT 3. Guidewire retention is associated with serious complications. Vannucci A et al. reported several incidences of guidewire retention and they correlated the episodes with operator fatigue, inexperience, inattention and lack of supervision. They estimated incidence of 1 in 3291 was found in same institute in over a period of 6 years 4. Similar incidences are reported during PCI 5. We encountered fractured guidewire which have been shown serious complications such as embolization or even cardiac arrest 6,7. Fractured guidewire was successfully removed with the help of a snare. Similar procedure was attempted by Park et al 8. The probable cause may be a forceful attempt to retrieve a guidewire which is angulated. So when resistance is encountered while withdrawing the

guidewire, it is advisable to remove entire assembly of catheter along with guidewire. This will ensure the guidewire is not fractured or lost inside the vein.

However, a faulty design of the guidewire can also lead to such a dreaded complication. Monaca et al. suggested a simple test to test integrity of the guidewire 9. The guidewire is held firmly between thumb and index finger of both hands and both the hands are moved in opposite direction till the 'j tip' of guidewire is straightened.

CONCLUSION:

Guidewire removal is also an important step during Seldinger technique of CVC insertion. Fracture of guidewire can happen if attempt is made to retrieve a bend guidewire or due to faulty design. During Seldinger technique, careful attention, help of an assistant, anticipating complications, learning through simulation and expert supervision will help avoid complications.

Clinical Significance:

Guidewire fracture is rare complication of CVC/ Haemodialysis catheter insertion. Such guidewire, if retained in situ unfortunately, can be successfully removed with the help of a snare under fluoroscopy guidance.

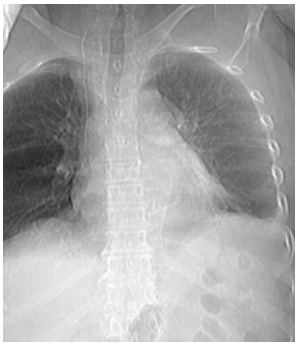

Image 1- Chest X-ray showing fractured guidewire.

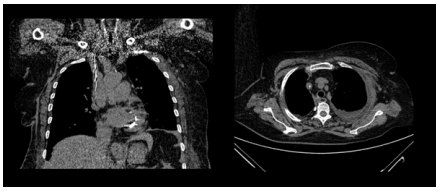

Image 2-CT scan image showing fractured guidewire.

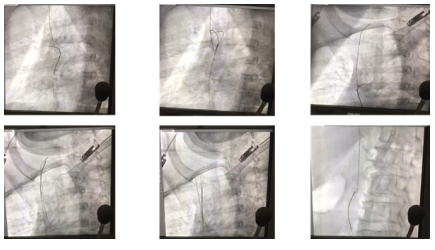

Image 3-fluroscopic Guided Retrival of guidewire.

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