Case Report

Non Surgical Management of Mini Guide Wire Embolism with Self Made Guide Wire Snare

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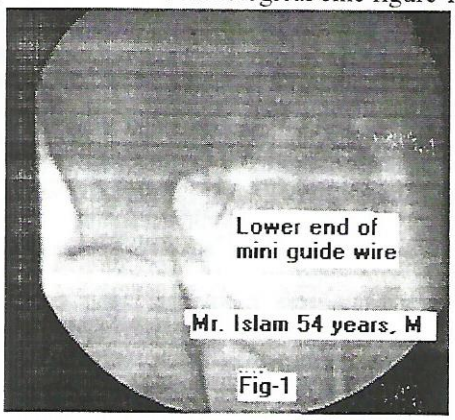
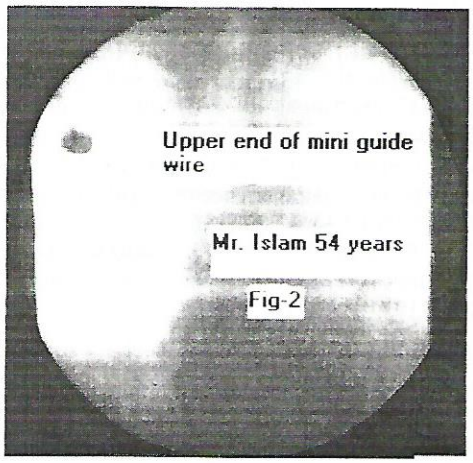
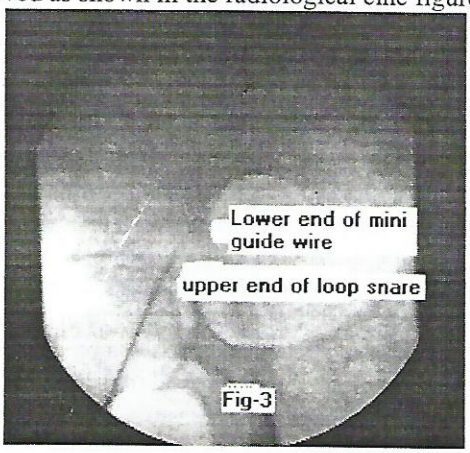
A 53 years old male presented in emergency department of local hospital with acute inferior wall myocardial infarction. During his initial course of treatment he developed symptomatic bradycardia and 2:1 atrioventricular block, for which he was tried for implantation of temporary pacing lead through right subclavian vein with 6 F venous sheath. During the procedure the operator embolized the J-tip mini guide wire in the heart, for which the patient was shifted to our hospital for the management of the embolised guide wire and coronary angiography.

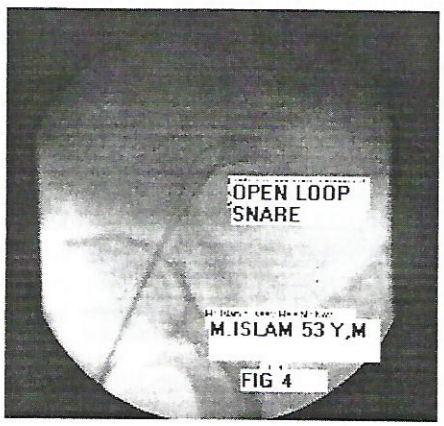
The patient was immediately brought to cardiac catheterization laboratory and the position of mini guide wire was located under fluoroscopy. Its upper end was lying near the junction of superior vena cava with right atrium and the lower end was in the right common iliac vein, as shown in the radiological cine figure 1 & 2.

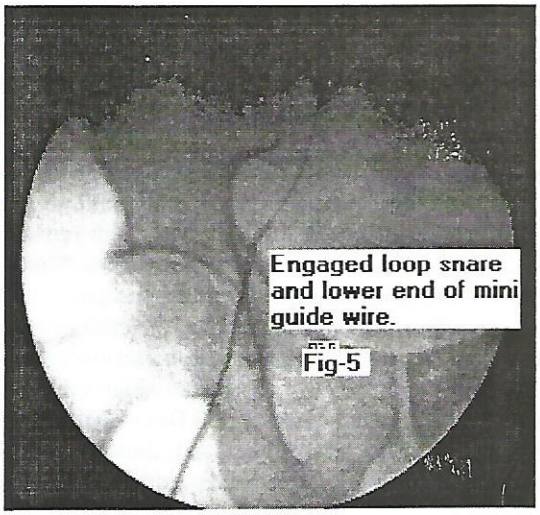




The patient was wrapped in a usual a sterile manner and under 2% xylocaine, local anesthesia right femoral vein was punctured and 7 F venous sheath with side arm was introduced half way with Seldinger's technique. The ordinary Teflon coated, (0.038" x 260 Cm) long guide wire was taken and folded in half at its mid section, as shown in radiological cine figure 9-12. The bended end was introduced through the sheath and was taken near the lower J end of the floating guide wire. The bended end was made into loop snare by fixing the one end of wire while moving the other end to change the size of the loop. To engage the lower end of the embolised wire, repeated twig ling manures were made. Once the lower end was engaged, the loop was released and the upper end of the sheath was pushed up by fixing the guide wire snare, up to the engaged part and fixed against the upper end of the sheath. After this the whole system along with sheath was removed as shown in the radiological cine figure 3 to 8.







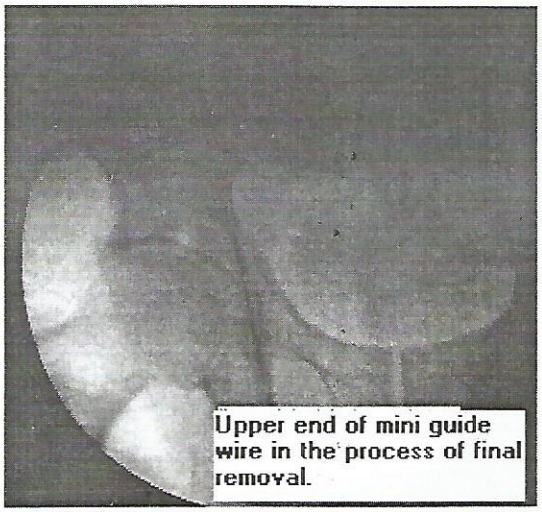
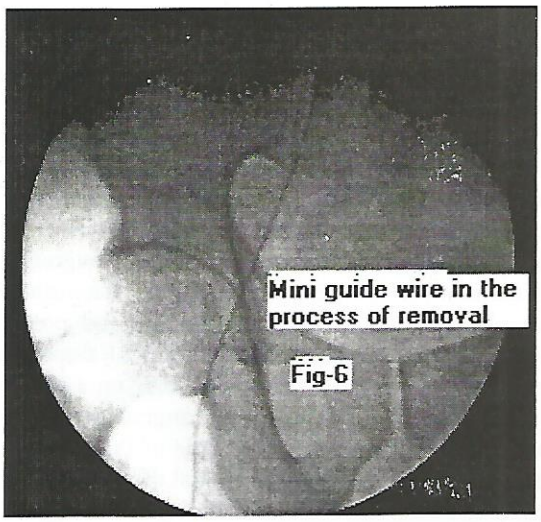


Fig-8



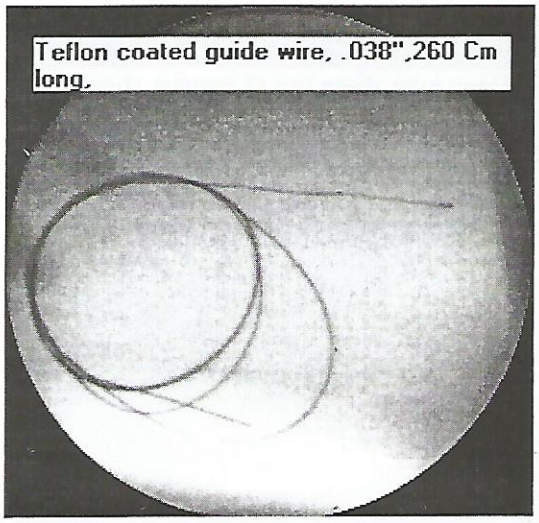
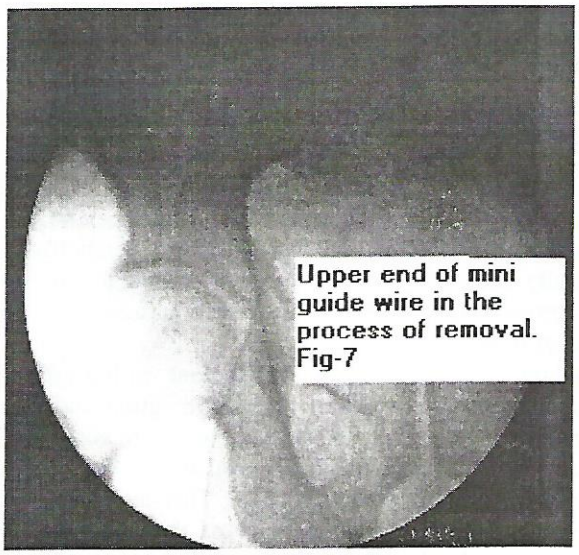


Fig-9:



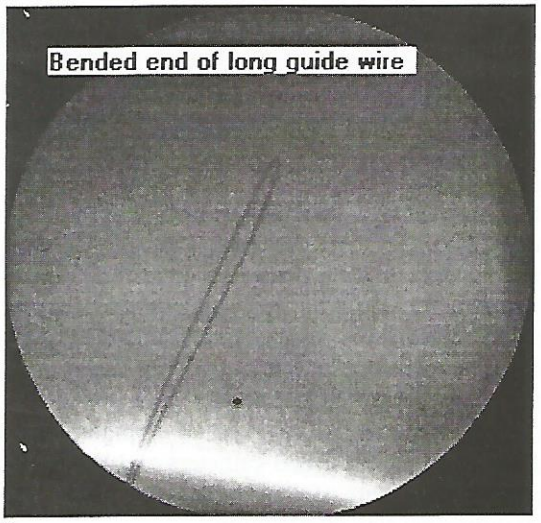


Fig-10

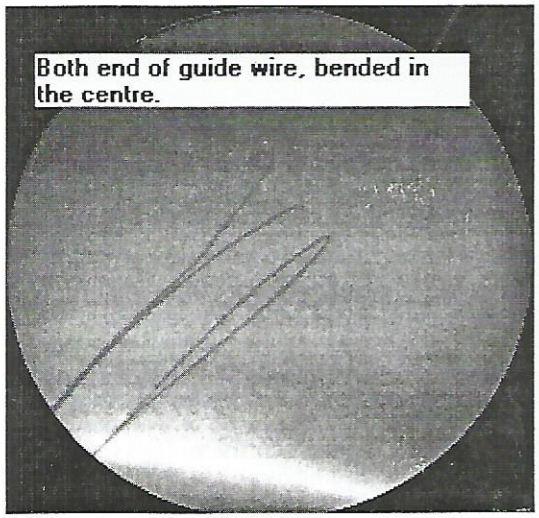


Fig-11:

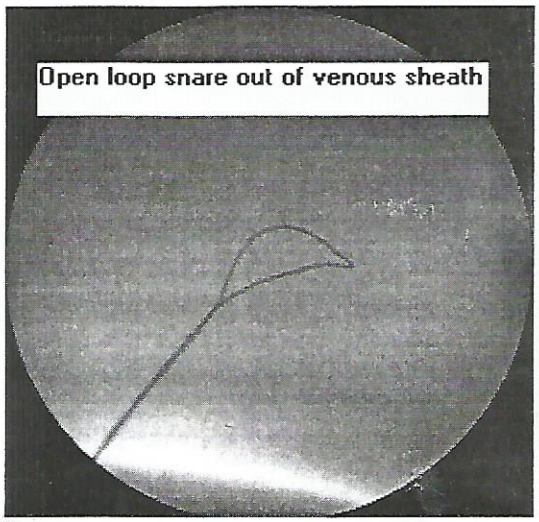


Fig-12:

After this the patient under went coronary angiography, had severe triple vessel coronary artery disease, for which he under went for coronary artery bypass grafting.

Discussion

Catheters and guide wires are routinely used for cardiac catheterization and intervention. Centrally positioned venous catheters are often placed for providing the venous access for administration of hypertonic intravenous alimentation fluid, long term antibiotic therapy, pressure monitoring, implanting temporary pacing leads and as a route for cancer chemotherapeutic agents in patients.

Fractured catheters especially tail of a pigtail catheter, curved tip of some preformed catheters and floppy end of angioplasty guide wire (0.014") are the usual embolic material during cardiac intervention.

Catheter embolism has been a recognized entity since 1954[1]. The incidence has been estimated at 0.1% for caval catheters[2]. A review of the English-language literature identified 402 cases of catheter embolism, with 313 involving the central vasculature[1]. Intravascular devices reported to be broken and/or separated without apparent cause, account for 14% of the catheter embolization cases[3]. While no etiology has been attributed to this phenomenon, compression of the catheter between the clavicle and the first rib has been postulated as a cause. The radiological "pinch off sign," first recognized by Aitken and Minton,[4] is suggestive of impending catheter fracture due to compression. Examination of these catheters has revealed a "fish mouth" appearance at the site of fracture[5].

Four cases of broken cardiac catheter emboli have been reported from Mayo and Gulab Devi Hospital Lahore, out of which, three cases occurred during right heart catheterization while one case, during left heart catheterization. Multipurpose A -1 catheters were used in right sided, while pigtail catheter was used during left sided catheterization. In all of these four cases the catheters were expired and possibly brittle due to improperly placed in hot and humid place. In 3 cases the broken parts of catheters were successfully retrieved non surgically with the same method used for the removal of mini guide wire, while in one case the broken catheter embolize in to left pulmonary artery, which was retrieved surgically.

Fracture of these catheters with migration of fragments into the vena cava or its tributaries, right heart, or pulmonary artery is an unpredictable and potentially serious complication. The final position of the fragment within the cardiovascular system depends on a number of factors. The route of entry and (if migratory) on gravity and position of the patient at the time of the accident, the length and stiffness of the material and the flow patterns of the vessel or cardiac chamber containing it.

Percutaneous retrieval of an intravascular foreign body is a standard method of treatment that obviates the need for major surgical procedures. Although intravascular foreign bodies do embolize in the aorta and some arterial branches, it is most frequently seen in the venous and right heart system.

The complication rate of non surgical retrieval is remarkably low. Care must be taken because of the potential for the dislodged fragment to embolize more distally and, as a result, become irretrievable[8]. A number of retrieval techniques to remove the intravascular foreign bodies have been described.

(a) Loop snare technique: This is done with a guide wire like device folded in half at its midsection and inserted through the catheter .It is flexible, loop size is easily changed, and percutaneous removal without cut down and venotomy is frequently possible. This technique can be particularly effective if the end of the fragment is free floating, so that lassoing is possible[6].

(b) Grasping forceps technique: Endoscopic forceps have also been effective; however, they have two major

drawbacks: short length and rigidity.[2,4,7] Due to these limitations it carries considerable risk of perforation. It has been recommended that the use of endoscopic forceps for transvenous retrieval of emboli be limited to situations where the fragment is in the superior vena cava or right atrium, since this is more flexible and thus safer[7].

(c) Hook-tip guidewire or catheters technique: It can be formed ad hoc and used to engage lengths of intravascular debris lacking an accessible free end. Tip -deflector guide systems can be useful, although final removal from vein of access has usually required a cut down and venotomy.

(d) Helical basket technique: This is particularly useful in children, since they have the smallest outside diameter of all devices. They have an advantage in retrieval of fragments within smaller vessel, since the spiral struts would fill the vessel wall to wall and simplify fragment entrapment.

(e) Balloon catheters technique: Simple balloon tipped catheters can be used percutaneously to move intravascular foreign bodies into more favourable positions for conventional catheter recovery. Balloons can also be used to prevent undesired distal embolization of foreign bodies during their recovery from pulmonary or systemic arteries.

Operative removals using both cardiopulmonary bypass and hypothermic circulatory arrest have been done successfully[9]. The vast majority of open retrievals were done before the introduction of, and improvement in, percutaneous techniques. Predictably, with physician experience and technologic evolution of noninvasive techniques, the frequency of reports of patients requiring thoracotomy has decreased[10].

Conclusion

Percutaneous intravascular foreign body retrieval is relatively simple, safe, with few possible complications in comparison with the surgical procedure and should be attempted before surgery. If these attempts are unsuccessful, the patient should be monitored for dysrhythmia. Operative removal is the last option for patients with emboli in high-risk locations. If these methods fail, then bacterial and thrombotic prophylaxis should be instituted and maintained for at least 2 years as these emboli are associated with complications such as infection, pulmonary abscess, dysrhythmias leading to sudden death; thrombosis with superior vena cava syndrome, erosions in contiguous structures and right atrial perforation[11,12]. Expired catheters should never be used. If there is any doubt about the proper storage of catheters then these should be checked for brittleness by stretching before use.

References:

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