Guide wire retention and removal

Primary Author: sameet syed M.D.
Rutgers-Robert Wood Johnson Medical School

Co-Authors: Adil Mohiuddin, MD; Geza Kiss, MD; Shaul Cohen, MD;

Introduction:
Central venous access is a common modality employed for coronary artery bypass procedures. Occasionally, guide wires may fracture and can be retained as a foreign body in the internal jugular vessels, subclavian vessels or subcutaneous tissue as reported in prior case reports. Retained guide wires or fragments of guide wires usually are attributed to human error; however, we are reporting equipment malfunction as an added cause to be wary of.

Case Description:
A 67-year-old female with PMHx of severe multivessel coronary artery disease, unstable angina, atrial fibrillation, hypertension, hyperlipidemia and s/p gastric sleeve surgery presented for multi vessel CABG. Intraoperatively, line placement was complicated. Right IJ central line was placed with ease; however, right IJ cordis would not thread over wire despite using sonosite for access. The right IJ wire was pulled out and a left subclavian cordis and pulmonary artery catheter were placed instead. All wires were accounted for post line placement check, and there were no further perioperative issues. The patient was extubated intraoperatively and fast tracked to the CCU. Standard post op chest x rays for lines were ordered, but no critical events were reported by radiology (Fig la, 1b). Patient was discharged and completed cardiac rehabilitation. Post rehab patient returned to the hospital three times for unstable angina, and on the 3rd visit the cardiologist reported seeing an external wire in subcutaneous tissue during left heart catheterization. The patient was informed about the finding and was advised to have it taken care of electively. She returned for elective removal with general surgery, who were unable to remove it; thereafter, cardiothoracic (CT) surgery/ (CV) anesthesiology were consulted. CT surgery removed the foreign body, and upon analysis it was found to be the external coil around the guide wire(Fig 2a, 2b). The guide wire had fractured and the outer coil splintered and slid off the internal wire. Fortuitously, this patient never had any pain, ectopy, or thrombus given the extravascular, subcutaneous location of the splintered coil. However, this case is a great example from a quality improvement (Q) standpoint for instituting additional layers of checks for patient safety.

Discussion:
Central line guide wires are fraught with known complications such as dislodgment, displacement, and getting empaled. Various complications like perforation, thrombosis, embolic phenomena and vessel occlusion can occur thereafter. However, with the growing number of different line kits there has been increased variability in guide wire length and structure, which can exacerbate complications. The necessity for quality and safety improvement initiatives is critical and we can
take steps within our subspeciality to lay the groundwork. We recommend the following with all central venous access:

- Preexamine guide wires for length and structure to detect any micro fractures
- Reevaluate guide wires after removal for length and integrity
- Personally review post op chest X-rays carefully to look for guide wire retention vs fragmentation and follow up with formal radiology reads.