A Retained Guidewire Escapes Detection:

A Root Cause Analysis

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Overview

A retained guidewire went undetected in a patient over a 3 week period despite being depicted on several chest radiographs.

We assess via a root cause analysis the factors that allowed this to happen.
Root Cause Analysis

- A root cause analysis helps identify what, how, and why an adverse event occurred.

- Start with data collection, then chart the event, identify root causes, and provide recommendations addressing the root causes that can be done to prevent another event.
Root Cause Analysis

- Focus on preventing another recurrence... not blame or punishment.
- No one intentionally wanted the adverse event to happen.
The Hospital Event

A femoral line was placed in an acutely ill patient. 3 weeks later, it was discovered the guidewire was retained in the patient’s vena cava.
First Step: Get the Facts Straight

- A multidisciplinary committee was formed consisting of a patient care supervisor, executive officer, nurse, surgery resident, and radiology resident.
- Data was obtained by examining the electronic medical record (EMR) and interviewing those involved including surgeons, radiologists, residents, and administration.
- A causal chart was formed highlighting key timeline events.
1) Patient transferred from the ED for urgent abdominal surgery.

2) Line placement needed. Neck ultrasound showed no good veins. Decision to go with femoral line.

3) Junior resident placed the line, senior resident observed till arterial puncture, then went to scrub.

4) Resident dropped the dilator, and a second kit opened.

5) Line placement completed. Anesthesia rushed to use the line, not sure it had been sewn in yet.

6) Resident rushed while cleaning and only accounted for the guidewire from the second kit.

7) 6 portable chest radiographs over 3 weeks reported a presumed mediastinal drain described only in the findings section of the report, not in the impression.

8) Patient didn’t have a mediastinal drain as could have been confirmed in a section in the EMR that includes all of the current patient's lines and drains. The radiologists were unaware this section existed.

9) On subsequent radiograph, report questions an intravascular foreign body. CT confirms the retained guidewire in the vena cava.

Patient taken to IR for retrieval of retained guidewire.
Root Cause(s)

- Failure to keep hands on the guidewire during the procedure and pressure for immediate use of the line.
- Lack of questioning attitude by radiologists and clinicians regarding the presumed mediastinal drain mentioned in the reports.
Other Causal Factors

Regarding Procedure:

- The resident was rushed due to the urgency of the situation and critical status of the patient.
- A second kit was opened during the procedure and only one of the guidewires were accounted for.
Other Causal Factors

Regarding Radiologist Reading:

- Multiple radiographs were obtained to check support devices. The guidewire is described in the findings section as a presumed mediastinal drain but was not referenced in the impression. The radiologists did not confirm whether the patient had a mediastinal drain whether through the EMR or direct physician communication.

- Providers who reviewed the reports only referenced the impression and did not notice mention of a presumed mediastinal drain in the findings narrative.
Recommended Corrective Actions to Prevent Reoccurrence

- Reinforcement with all operators to never take hand off the guidewire and to account for contents of all kits opened for a procedure.
- Educate radiologists on the ‘Lines, Drain, and Airways’ section available in the EMR.
- Include unusual finding in the Impression of the report.
- Direct communication with the referring physician of unusual findings.
Summary

- We show how a root cause analysis helped identify key factors that allowed a retained guidewire going unnoticed.

- Remember, human error is inevitable, and the goal of a root cause analysis is to prevent another event.