ANESTHESIA & the LAW
A Risk Management Newsletter
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PPM

"That Was Left Where?"

Preventing Retained Foreign Object Anesthesia Claims

Background

More than five million central venous catheters (CVCs) are placed in the United States every year to monitor central venous pressure, administer fluids and medications, and perform hemodialysis.[1] The Seldinger technique is a common method used in CVC placement that involves insertion of an introducer needle into the vein, advancing the guidewire through the needle, removing the needle, and then advancing the catheter over the guidewire. Once the catheter is in place, the guidewire is removed.[2] This technique is generally considered safe; however, a rare but serious complication is the retention of a guidewire or wire fragments that can cause dysrhythmia, vascular damage, infection, embolism, thrombosis, cardiac perforation and tamponade.[3] The incidence of retained guidewires is estimated at 1:3,000 procedures with a reported mortality of up to 20%.[3,4] The most common root causes cited for these sentinel events include: inattention, distraction, inexperience (either in Seldinger technique or central venous cannulation), inadequate supervision of trainees, high workload and staff fatigue.[5,6] Retention of guidewires is a completely avoidable complication of CVC placement and considered a "never event."[7] Most retained guidewires or wire fragments are immediately detected by x-ray, during routine follow-up visits or from patient's reports of pain or discomfort. Interventional radiological methods are preferred for retrieving lost or retained guidewires.[8] However, as highlighted by the following case studies, the unrecognized failure to remove the wire may not be discovered for months and even years after the procedure causing both physical and emotional harm to patients.

Retention of guidewires is a completely avoidable complication of CVC placement and considered a "never event."

Case #1

A 49-year-old female presented for resection of right paraspinal tumor with general anesthesia. For the procedure, the anesthesiologist placed a central venous catheter in the right internal jugular vein. The patient remained in the hospital for a week postoperatively. During that time period, multiple x-rays and a CT scan were obtained. However, radiology did not note or report any foreign objects on the imaging studies.

Three years later the patient presented to the emergency department with complaints of chest pain and tightness with shortness of breath. An x-ray demonstrated the guidewire utilized to place the central venous catheter extending from the superior vena cava through the right atrium and into the inferior vena cava. However, the radiology findings were not disclosed to the patient. The patient was discharged with pain medication for her symptoms.

Approximately six months later, the patient presented to the emergency department with complaints of severe rectal and pelvic pain exacerbated by standing or movement. Radiographic studies were obtained that demonstrated several guidewire fragments. The patient was informed of the imaging findings and provided with options to attempt removal. Interventional radiology attempted to remove a fragment in her neck without success. It was decided to suture the fragment into the soft tissue of the neck to prevent the guidewire from migrating further. No additional attempts were made to retrieve the other fragments at that time.

One year later the patient presented again to the emergency department with complaints of severe back pain. The patient underwent multiple procedures to attempt to remove portions of the guidewire. However, there were three fragments that could not be retrieved. One was located in the right ventricle of her heart. The two other fragments were in her right neck area in the clavicle region and her left groin area. The patient complained of severe pain in all three of those areas, particularly with certain types of movement.

The patient and her husband sued the anesthesiologist, his practice group, the surgeon, his

practice group and the hospital. The patient alleged the anesthesiologist was negligent for failing to remove the guidewire following the placement of the central venous catheter. The patient alleged all of the defendants were negligent for failing to identify the retained guidewire despite multiple imaging studies that were obtained postoperatively. The patient claimed $2 million in damages for physical disability, pain and suffering, mental anguish, emotional distress, as well as special damages for past and future medical expenses.

During discovery, a review of the medical records confirmed there were several chest x-rays taken in the days following the surgery. This included a series of chest x-rays taken in conjunction with placement of the central venous catheter. According to the anesthesiologist, none of these x-ray reports noted the retained guidewire. Defense radiology experts who later reviewed the imaging studies opined the guidewire was present on all of the x-rays taken during the initial hospitalization and should have been identified and reported.

The parties participated in mediation prior to trial. With the PPM insured's consent, the case was settled for $500,000 on behalf of the anesthesiologist. The remaining defendants settled for confidential amounts.

Risk Management Analysis

While the radiologists who reviewed the initial imaging studies could not explain why they did not identify the retained guidewire, a phenomenon called inattentional blindness[9] may have contributed to missing the foreign object. In this case, the radiological orders were to confirm proper placement of the central venous catheter. The radiologist's attention was focused on a different task rather than an unexpected — albeit salient — retained guidewire.

The radiologist who reviewed the x-ray taken three years postoperatively noted the presence of the retained guidewire on the imaging report. However, those abnormal findings were not communicated to the emergency room physician or the patient. The Joint Commission recommends that facilities develop effective processes and procedures for preventing and detecting unintended foreign objects, including effective communication between radiology and the involved healthcare providers.[10]

Case #2

A 52-year-old female underwent a bilateral total hip replacement under general anesthesia. The anesthesiologist placed a central venous catheter in the patient's jugular vein. A second anesthesiologist took over the case shortly after the placement of the central line. A chest x-ray was taken in the recovery room to confirm placement of the catheter. However, the radiologist either failed to review the chest x-ray or read the x-ray but did not prepare a report. The patient was ultimately discharged home with no apparent sequelae.

The patient claimed that as a result of the presence of the foreign body, she was seriously injured…

Ten months later the patient developed symptoms of chest pain and presented to the emergency department. Chest x-rays taken at that time showed the guidewire was present in the patient's heart. Interventional radiology attempted to remove the wire without success. Thereafter, a thoracic surgeon tried to remove the guidewire, but he was unable to remove the entire wire and a piece was left in the patient's heart and vena cava.

The patient sued the anesthesiologists, their anesthesia practice group, the radiologist, his radiology practice group and the hospital. The patient alleged all of the defendants were negligent in: the performance of the catheterization, leaving the foreign body in the plaintiff's body, failing to observe the foreign body on the x-ray, failing to report the foreign body, and failing to remove the foreign body. The patient also alleged the radiologist negligently read and interpreted the x-ray or failed to read the x-ray and report any abnormal findings.

The patient claimed that as a result of the presence of the foreign body, she was seriously injured, suffered severe pain and emotional distress, and was required to undergo surgery in an effort to remove the foreign body. She asserted that one or more large fragments of the wire remain in her body. She also claimed that she is at risk for serious complications, remains disabled, and may require further surgery. The patient's initial settlement demand was $1,200,000.

The practice at the hospital at the time of this adverse event was for the radiologist to review the chest x-ray taken in PACU to confirm proper placement of the central venous catheter. If there was an abnormality, the radiologist was supposed to call the surgeon and the anesthesiologist. The anesthesiologist testified he never received a phone call from the radiologist and was never notified of any abnormalities on the x-ray report. He testified further that he relied on the nurse to report the results of the chest x-ray to him, especially if there was an abnormality noted. The radiologist testified that somebody from his radiology group would have been on site at the hospital from 0730 to 1830. The chest x-ray in this case was taken at 1900 when there were no radiologists present. A radiologist would have been on-call and could have read the films from their home; however, no request was made to the on-call radiologist.

All of the defendants consented to settlement negotiations and agreed to contribute to a global settlement offer. PPM settled the case on behalf of the anesthesia defendants for $275,000. The remaining defendants settled for confidential amounts.

Risk Management Analysis

The absence of a policy and procedure to ensure the chest x-ray was read and the findings reported after hours was a root cause of this adverse outcome. Failure in communication between the anesthesiologist and nursing staff to confirm the chest x-ray had been read also contributed to this sentinel event.

Risk Management Strategies to Prevent Retained Guidewires

- Increase education and training stressing the importance of the need to inspect the wire on removal, especially if resistance is encountered during placement[3]
- Implement a checklist that requires confirmation of the removal and inspection of the guidewire by the anesthesia professional and a second observer[11,12]
- Standardize central catheter line kits[12]
- Hold the proximal end of the guidewire at all times[5]
- Avoid inserting the guidewire beyond 18 cm[13]
- Always inspect the wire for complete removal at the end of procedure[6]
- Confirm location of the central line and absence of complications — e.g. pneumothorax or retained guidewire
- Post-procedure imaging to check for presence of foreign objects and identify the type of procedure performed on the imaging orders — the anesthesiologist should also review the xray
- Consider improved design features of CVC guidewires and kits — e.g. bright or different color of proximal tip, longer guidewires, retention devices attached to proximal end of wire to prevent it from advancing inside the catheter, locked procedure pack that requires the removal of the guidewire to open the procedure pack[5]

Other Retained Foreign Object Claims

In the past several years, PPM has identified a developing loss trend involving retained temperature probe tips and nasogastric/orogastric tube fragments during bariatric surgery. These adverse events involve probe/tube stapling or suturing during gastrectomy or gastroenterostomy. These complications can be

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associated with significant morbidity[14] and often require additional surgery to remove the foreign object, as highlighted by the following case.

Case #3

A 39-year-old female patient underwent laparoscopic gastric bypass with general anesthesia administered by a CRNA who was supervised by an anesthesiologist. An esophageal temperature probe was placed as part of the anesthetic. During the procedure, the CRNA noted a period of about 30 minutes when the temperature probe was malfunctioning. She removed and replaced the probe. She did not examine the tip of the probe that was removed before replacing it. The supervising

anesthesiologist was not notified that the CRNA changed the temperature probe.

Nine months later the patient presented to the surgeon with complaints of abdominal pain. An x-ray revealed the tip of the temperature probe in the surgical anastomosis that was presumably cut by the gastrointestinal stapler. The patient underwent surgery to remove the retained distal end of the temperature probe.

The patient sued the anesthesiologist, his practice group (for the alleged negligence of the CRNA), the surgeon and the hospital. The patient alleged the defendants negligently: left a foreign object in her gastric remnant, failed to inspect and test her

An x-ray revealed the tip of the temperature probe in the surgical anastomosis that was presumably cut by the gastrointestinal stapler.

abdomen to ensure no foreign objects remained, and failed to immediately notify her that a foreign object had been left in her abdomen after surgery.

The patient's anesthesiology expert opined that the temperature probe was inserted 4-5 cm too far into the esophageal tract, such that it extended into the surgical field. He testified that the stapling device used by the surgeon likely severed the tip of the temperature probe. He testified further the CRNA should have pulled back the temperature probe before the stapling occurred. He also testified the CRNA should have ensured the probe tip was intact due to the fact that there was a period of time when the temperature was not recorded before she replaced the probe.

The patient dismissed the hospital and surgeon prior to trial. With PPM's insured anesthesia practice group's consent, the case settled for $75,000 on behalf of the CRNA.

Risk Management Analysis and Recommendations

During discovery it was revealed that the hospital had received a shipment of temperature probes that were longer than what the anesthesia professionals were used to using. The lack of training and experience with the new devices contributed to the tip being placed farther into the patient's stomach. The lack of communication between the surgeon and the CRNA also played a significant role in this adverse event. Surgeons should request the anesthesia professional to verify the esophageal temperature probe has been pulled back or removed and ensure there are no other instruments or devices (e.g. nasogastric or orogastric tube) in the stomach before using the stapler. Anesthesia professionals should also make sure the probe doesn't change position during the procedure — e.g. being pushed farther into the stomach by placement of a bougie or other device. Use of nasopharyngeal or skin temperature devices should also be considered for bariatric procedures to avoid these adverse events.

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PPM Guest Speakers at Upcoming Events

Wade D. Willard, JD, President and Chief Operating Officer and Brian J. Thomas, JD, Vice President-Risk Management will be participating as guest speakers at several upcoming Society meetings. Please visit our website, ppmrrg.com, for more information on dates and times. Our Business Development team members will also be in attendance. We look forward to the opportunity to visit with you at these events.

AUGUST 2018

August 25, 2018
Oklahoma Society of Anesthesiologists Annual Meeting
The Skirvin Hilton • Oklahoma City, OK
Guest Speaker: Brian J. Thomas, JD, Vice President-Risk Management
Jim Humphrey, Regional Representative-Business Development

SEPTEMBER 2018

September 8-9, 2018
Wisconsin Society of Anesthesiologists Annual Meeting
The Osthoff Resort • Elkhart Lake, WI
Guest Speaker: Brian J. Thomas, JD, Vice President-Risk Management
Jim Humphrey, Regional Representative-Business Development

September 23-26, 2018
American Osteopathic College of Anesthesiologists Annual Conclave and Convention
Paradise Point Resort • San Diego, CA
Guest Speaker: Wade D. Willard, JD, President and Chief Operating Officer
Andrew Clark, Business Development Associate

OCTOBER 2018

October 13-15, 2018
American Society of Anesthesiologists – Anesthesiology 2018
Mascone Center • San Francisco, CA
Guest Speaker: Brian J. Thomas, JD, Vice President-Risk Management
Steve Stark, Vice President-Business Development
Jim Humphrey, Regional Representative-Business Development
Andrew Clark, Business Development Associate

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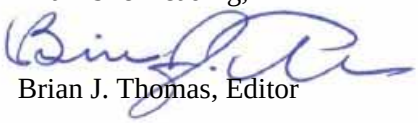
In This Issue

Unintended retained instruments and foreign objects after surgery are often associated with surgeons and nursing staff. However, anesthesia professionals may also be involved in adverse events resulting from retained foreign bodies. Complications from placement of central venous catheters include breakage/fracture of the guidewire and loss of the wire — both recognized loss and unrecognized loss and failure to remove the wire. Complications from retained guidewires are serious and can be life-threatening. Retained esophageal temperature probe tips and tube fragments associated with bariatric surgery are also a developing trend identified in Preferred Physicians Medical's loss data. In this issue, we examine these preventable adverse anesthesia events, highlight several case studies and offer risk management analysis and strategies to prevent retained foreign objects during anesthetic procedures.

Thanks for reading,



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