GHOSTS IN THE OPERATING ROOM: A QUALITY IMPROVEMENT CASE STUDY ON POLICIES AND PROTOCOLS FOR INCORRECT SURGICAL COUNTS

Noah J Jordan DO, William Witt MD, Danielle Walsh MD, FAAP, FACS, John S Roth MD, FACS
Department of Surgery, University of Kentucky

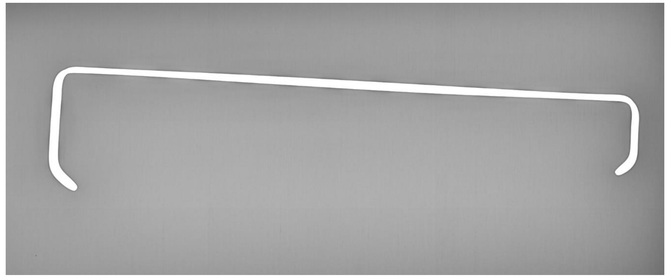
Introduction

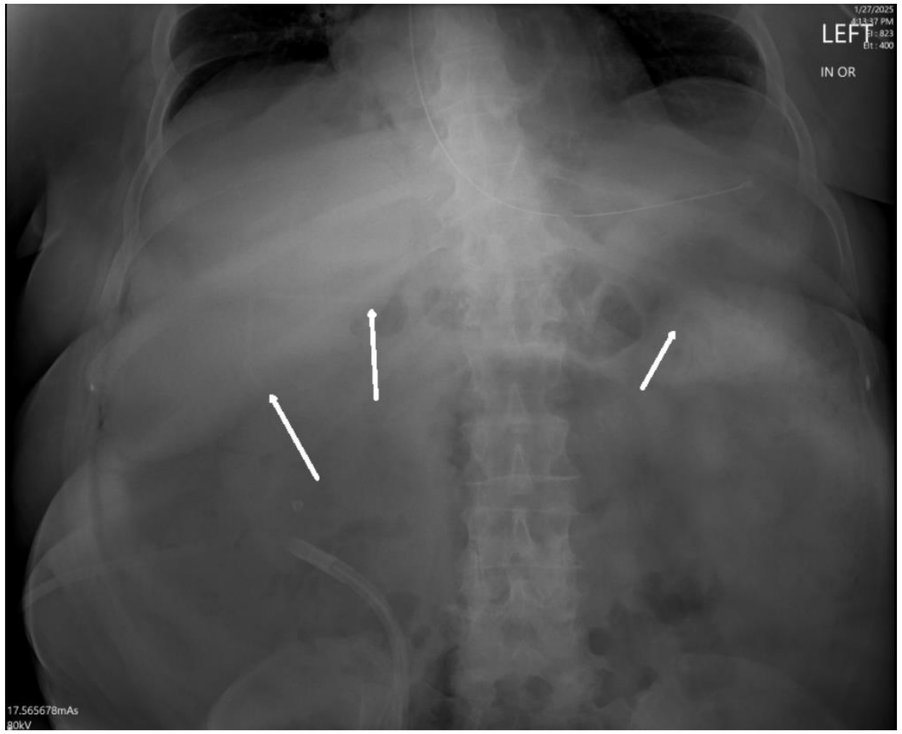
Incorrect surgical counts at closing require active investigation through carefully crafted hospital policies to prevent the “never event” of a retained surgical item. However, policy gaps can develop with technological changes. We identified a knowledge and policy gap related to intraoperative digital imaging resulting in false positive identification of a retained object. Few surgeons are aware that intraoperative digital radiographs for retained intraoperative foreign objects can result in a false positive if incorrect image sequencing is utilized. We describe best practices and revised intraoperative policy and practice regarding incorrect surgical counts.

Methods

A patient underwent a concurrent left radical nephrectomy and recurrent incarcerated incisional hernia repair in which multiple transitions of care occurred. An incorrect instrument closing count (missing Army-Navy retractor) prompted intraoperative digital radiographs to assess for retained foreign bodies. A radiograph of a similar instrument was performed to aid in instrument identification by the radiologist. A subsequent radiograph was taken of the patient’s abdomen per protocol. The abdominal film demonstrated the presence of a retained retractor, despite the instrument having not been utilized during the procedure. Repeat imaging was performed with 2 views which affirmed the absence of a retained instrument.

A multidisciplinary team inclusive of experts in radiology and patient safety studied the event, confirming the presence of a digital “ghost” image. A quality improvement process was undertaken to revise policies and procedures to prevent future safety events. An education outreach followed the improvement process.





Results

Following an exhaustive review, an understanding of the physics of overexposure on a digital detector plate from a metallic object was discovered. The metallic material leads to residual signal on the subsequent film, creating a “ghost image”, a false positive identification of a retained instrument. The surgical team collaborated with the administration to revise hospital policy specifying imaging order when surgical counts are incorrect; patient images are performed prior to images of missing items. Institution-wide educational efforts were undertaken to inform staff. No further episodes have occurred in 5 month follow up.

Conclusions

Digital imaging can create a false positive identification of retained metallic items unbeknownst to surgical teams. Policies around intraoperative imaging should account for overexposure associated with metallic foreign body imaging to prevent “ghost” images. Education and awareness are essential to avoid potential morbidity associated with false positive identification of retained surgical instruments.