



Imaging the Culprit's Twin: Search for the Intra-operative Retained Foreign Body

Kathleen D. Egli, M.D., Pennsylvania State College of Medicine
 Michael A. Hess, AA, RT(R), Penn State Hershey Medical Center

Introduction

Images of the operative site are taken immediately post-operatively in the setting of a suspected retained foreign object. This is most frequently triggered when the postoperative sponge or instrument count does not match the preoperative count, but also occurs in crash, or emergency surgical procedures when no such count was performed prior to the surgery.

Until 18 months ago, policy at our institution permitted the attending surgeon to interpret such images without waiting for the STAT radiology read. The index case occurred when a surgeon closed the abdomen after failing to recognize a surgical sponge present on the x-ray image. (Figure 1) and the positive Radiology report telephoned to the OR either never reached the surgeon or was discounted.



Figure 1 Sponge in right abdomen

An extensive quality review was undertaken and multiple peri-operative processes were changed. These included mandated immediate Radiology reporting to the surgeon prior to wound closure. Additionally, Radiology devised a strategy to x-ray a duplicate of the missing item at the same time as the patient was x-rayed. These two images are then immediately loaded together into the PACS side by side, making it much easier to evaluate the body part for the missing object. (Figures 2 and 3)



Figure 2A



Figure 2B

Technique

Intra-operative imaging is performed with CR using a technique similar to what one would use for a finger film – usually 60 kVp and 2 to 2.5 mAs.

The duplicate missing sponge or towel is wetted and balled up, to simulate its likely appearance in the abdomen. Additional technologist time in room averages 5 minutes.

Figure 3A



Figure 3B



Results

From 12/1/08 through 12/31/09 there was not been a single delayed diagnosis of retained intra-operative foreign body. In those 13 months a total of six (6) retained objects were found.

In 272 surgeries there was suspicion of retained foreign object. Sixty-eight (68) of these were for crash surgeries. A total of 204 cases were subject to the new policy. Of these, 183 cases had a duplicate image taken; in 21 cases a duplicate image should have been performed but was not. Overall compliance with the policy was 90%. Non compliance with the policy was more frequent early on; there were only 4 cases of non-compliance in the last 6 months of the study.

Month	# of retained FB x-rays taken	# of cases requiring duplicate x-ray by new policy	# of cases with duplicate x-rayed & in PACS	% compliance with policy
Dec 08	18	16	12	75
Jan	21	10	8	80
Feb	15	15	13	87
Mar	20	13	13	100
April	22	17	14	82
May	22	17	17	100
June	25	16	11	69
July	29	27	24	89
Aug	17	10	10	100
Sept	22	18	17	94
Oct	22	15	14	93
Nov	23	17	17	100
Dec 09	16	13	13	100
13 month summary	272	204	183	90

Discussion

At first some technologists were skeptical of this process re design because of the extra OR in room time, but it has now become routine. An occasional surgeon is resistant but complies. The radiologists, particularly the residents and on call faculty who rarely read these studies, have found the duplicate object imaging to increase their diagnostic certainty.

Conclusions

X-raying a duplicate of a suspected retained foreign object and loading into the PACS immediately adjacent to the patient's x-ray has been a successful quality improvement which can be implemented with few additional resources.