

In the name of God



Shiraz E-Medical Journal

Vol. 9, No. 4, October 2008

<http://semj.sums.ac.ir/vol9/Oct2008/87004.htm>

Answer to Clinical Quiz of the Previous Issue: Retained Foreign Body, Brief Review

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Received for Publication: April 4, 2008, Accepted for Publication: July 15, 2008.

Introduction:

A surgical sponge is the most common type of retained foreign body (RFB). Two usual responses lead to the diagnosis of a retained sponge. The first type is an exudative inflammatory reaction with the formation of an abscess and usually leads to early detection and surgical removal. The second type is aseptic with a fibrotic

reaction to the cotton material and development of a mass.⁽¹⁾

In the abdomen the sponge can be surrounded by omentum and intestines, which attempt to encapsulate it. The exerted pressure and irritation on the bowel loops can lead to necrosis of the intestinal wall and the sponge erodes partially or entirely into the lumen of the bowel. This process can lead to obstruction

or fistula. Patients develop symptoms of abdominal pain, nausea, vomiting, anorexia, and weight loss resulting from obstruction or a malabsorption type syndrome caused by the multiple intestinal fistulas or intraluminal bacterial overgrowth.^(1,2)

Diagnosis

The possibility of a RFB should be in the differential diagnosis of any postoperative patient who presents with pain, infection, or palpable mass. The first diagnostic modality to rule out a RFB should be a CT scan and often it will be the only test needed. The CT findings of a sponge usually describe a rounded mass with a dense central part and an enhancing wall. Other features of retained sponges or towels include a whorl-like appearance with trapped air bubbles and cystic masses with infolded densities. MRI features can be confusing because the radiopaque marker is not magnetic or paramagnetic so is not visible.⁽¹⁾

Clinicians usually think that the diagnosis of a RFB on an intraoperative radiograph is easy and obvious, but often this is not the case. Intraoperative radiographs can be of poor quality, especially in obese patients. Correctly identifying a sponge on a radiograph can be difficult. The surgical markers may become twisted or folded and present an unusual image.⁽³⁾ For instance, in a report of 13 patients with a retained sponge, the radiopaque marker inside the sponge was seen in only 9 radiographs and even then was not immediately recognized for what it was.⁽⁴⁾ Markers have been

misinterpreted as calcifications, intestinal contrast material, wires, or surgical clips.⁽¹⁾

Treatment

The usual treatment of a RFB is removal. Reopening the previous operative site is one possibility, but endoscopic or laparoscopic approaches may be attempted.⁽⁵⁾

One possible complication during surgical removal of RFB is perforation of adherent bowels, which may be missed. We had another case with retained two surgical towels during emergency cesarean section. Her surgeon removed the towels through a small incision. However, she was admitted in our service three days later with clinical picture of generalized peritonitis. Explorative laparotomy revealed a missed small bowel perforation.

In some instances the attempt to remove the retained foreign body may cause more harm than the item itself, although in these circumstances the foreign body is usually a needle or small part of a surgical item. In these cases, removal is not recommended. Rarely is this an appropriate course of action for a retained sponge, which should always be removed.⁽¹⁾

Prevention

Counting sponges is an important issue. In general, 4 separate counts are recommended: the first when the instruments are set up or sponges unpackaged before surgery begins, a second before closure of any cavity (e.g. stomach, bladder, uterus) within the

operative cavity, a third as wound closure begins (usually started at closure of the fascia), and the final count performed during skin closure. It should be noted that placement of surgical mesh constitutes premature closure of a cavity. In these instances, a count should be performed before the completion of the insertion of the mesh. Guidelines also recommend counting on the permanent relief of either the scrub or circulating nurse. Bloody sponges must be individually unfolded and inspected visually as they are counted to be sure that two sponges are not stuck together. The counts of the sponges should be visually available to all and are often written on dry erase boards in each operating room.^(1,6)

Recently, New England Journal of Medicine published an article about risk factors of RFBs. Of the 8 risk factors the authors identified (emergency operation, unexpected change in operation, more than one surgical team involved, change in nursing staff during procedure, body mass index (BMI), volume of blood loss, female sex, and surgical counts) only 3 were found to be statistically significant by matched multivariate logistic regression. The 3 significant risk factors were emergency surgery, unplanned change in the operation, and BMI. The counting of sponges and instruments was not a significant predictor in the multivariate model. Although all 3 factors were significant, the 9-fold increase in risk associated with emergency surgery was impressive. In addition, in 88% of the cases where there was a RFB and counts

were performed, the counts were falsely called correct. The authors recommended "radiographic screening" at the end of high risk cases as a possible adjunct to improve detection of RFB. Surgeons should place radiologically detectable sponges and towels in the surgical site, carefully consider the use of small sponges in large cavities, and perform a methodical wound examination each and every time before they begin to close the wound.⁽⁷⁾

New technologies are being developed that will hopefully decrease the incidence of RFB. An electronic article surveillance system has been examined which uses a tagged surgical sponge that can be identified electronically.⁽⁸⁾ Bar codes can be applied to all sponges, and with the use of a bar code scanner the sponges can be counted on the back table. The use of radiofrequency identification systems holds much hope for application in the area of detection of sponges.⁽¹⁾

Conclusions:

1. RFB should be in the differential diagnosis of any postoperative patient who presents with pain, infection, or palpable mass.
2. Surgeons should perform a methodical wound examination in every case, and not close wounds in cases in which there has been an incorrect count reported.
3. Perioperative care nurses should practice well-defined counting methods for sponges and needles and accounting systems for instruments. They should

perform these actions as a team using good communication techniques.

4. Identifying a sponge on an intraoperative radiograph is difficult.

5. The first diagnostic modality to rule out a RFB should be a CT scan.

6. One possible complication during surgical removal of RFB is missed perforation of adherent bowels.

7. The three risk factors for RFB are emergency surgery, unplanned change in the operation, and BMI.

8. Some authors recommended radiographic screening at the end of the above high risk cases to improve detection of RFB.

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