Forgotten surgical sponge (gossypiboma), removed 5 years later

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Retained postoperative foreign bodies, of which sponges are the most common, are a rare but dangerous error following surgery.[1] This accident seems to be occurring most frequently in general and gastro-intestinal surgery followed by operations in gynecology and obstetrics and orthopedics.[1] The condition is sometimes called "gossypiboma" due to the feared possibility of retained sponge (RS) causing gossip on surgeons.[2]

Here we present a case of retained surgical sponge with delayed presentation and a review of clinical presentation, risk factors, management and some prevention strategies to increase awareness among surgeons and radiologists and, thus, avoid unnecessary morbidity.

A 45-year-old man was presented to our department due to vague generalized and chronic abdominal discomfort. Five years ago, he had a car accident and was in a state of shock (unstable hemodynamics: blood pressure 70 mm Hg and pulse rate 130/minutes), and had signs of abdominal trauma and tenderness on entire abdomen and his left flank. Diagnostic lavage was positive for active internal bleeding and therefore an emergency laparotomy was carried out, which revealed a huge expanding hematoma in the left kidney along with deep lacerations. Left nephrectomy was performed by a urology group. Sponge count performed at the end of the operation revealed a missing sponge. However, the surgeon terminates the operation due to the patient's unstable condition and later forgot to investigate or obtain a radiograph after the operation.

Presently, ultrasonography (US) was in favor of a huge cystic lesion, and due to the endemic condition, a hydatid cyst was suggested. However, abdominal x-ray revealed a metallic opaque ring, routinely used in our surgical sponges (**Figure 1**). Computerized tomography confirmed and showed a well defined mass with internal heterogeneous densities and a metallic substance. Hence, exploratory laparotomy was carried out, in which a large thick walled (10 mm) cystic lesion, 4 liters of serous yellowish fluid and a retained sponge was found and removed. After evacuation of the retained sponge he was discharged. He is now claiming for a malpractice lawsuit against the surgeon and medical staff.

Figure 1 - Abdominal x-ray of the patient, revealing the metallic ring accompanying the surgical sponge.

The retention of sponges and instruments is considered by many to be avoidable, and when it occurs, it can attract wide, critical attention and press coverage. There is great uncertainty regarding why these incidents occur and how to prevent them. The standards of the Association of Operating Room Nurses have long required that only sponges detectable on radiography are used and that they are counted once at the start and twice at the end of all surgical procedures.[3] The standards also recommend that instruments are counted in all cases involving an open cavity. If a count is incorrect, that is, not all materials are accounted for, then radiography or manual re-exploration is to be performed. Some previous reports on RS concern failure to adhere to these standards.[3] Our case is also an example of failure to perform the standard recommendations, which were due to the unstable condition of the patient. However, in most cases, foreign bodies go undetected despite proper procedures.[1,4]

Presentation may be as a vague abdominal pain, as seen in our patient, a pseudotumoral, occlusive or septic syndrome. However, in most case the patients may remain asymptomatic for as long as several decades.[5] Although current surgical swabs are labeled with radioopaque markers, which facilitate their detection, the diagnosis of gossypiboma is not easy and a high index of suspicion must be present. The markers used in our center are metallic rings, sewed to the sponge. Therefore, they cause a very good radioopaque picture and facilitate diagnosis (**Figure 1**). In our case radiography was not obtained. The

surgeon explained that since the patient's condition was very unstable, he had to immediately transfer him to surgical intensive care unit. He had explained that the patient's condition was initially hopeless and he never thought that the patient would survive the trauma and so did not find it necessary to obtain a radiograph. However, when the patient's condition improved, he absolutely forgot the retained sponge. The diagnosis is usually possible using plain x-ray. Sometimes, even in the presence of a radioopaque marker, RS can be difficult to visualize and may be overlooked, or an erroneous diagnosis may be made. Ultrasonography (US) and radiology (especially CT scan) contribute significantly to the detection of gossypibomas; magnetic resonance imaging is a less used technique. The US show a hyper-reflective mass with hypoechoic rim and a strong posterior shadow. The CT shows a well-defined mass with internal heterogeneous densities.[4,5]

Human errors may not be totally abolished, but must be reduced to a minimum. In recent years, patients seem increasingly prepared to complain and in some cases to take legal action for compensation when their health givers mistakes have caused them injury. Increasing litigation in recent years makes it more and more necessary for the surgeon to be on his guard against actions or omissions that might be construed as professional negligence. Gawande et al[5] performed a case control study of retained foreign bodies in surgical patients in order to identify risk factors for this type of error. They studied 61 retained foreign bodies and concluded that the risk of retention of a foreign body after surgery significantly increases in emergencies, with unplanned changes in procedure, and with higher body mass index. Change in nursing staff during the procedure, and estimated volume of blood lost (per 100 ml increment) were also associated with increase rate of RS.[5] The 3 significant risk factors were all present in our patient, who was explored with the possible impression of a splenic laceration, but a lacerated kidney was observed. Kaiser et al,[1] analyzed records of 40 cases involving a claim of retained surgical sponges. The occurrence variables mostly associated with RS were as follows: team fatigue, end of shift, adherent sponges, system problem, and surgeon's refusal for a repeat count, falsely negative intraoperative x-ray, excessively bloody procedure, incorrect package count, conversation in the operating room (OR), OR registered nurse left the room, no count performed, and the sponge looked for was not found.[1] Unfortunately, most of these risk factors also existed in our patient therefore needing more care from the surgeon.

Strict adherence to operating room rules, continuous medical education for all personnel working in the operating rooms, and the implications of failure to conduct punishments are the corner stones for prevention.[3-5] Smallwood[3] suggested a routine ''survey'' radiographs after all major open intra-abdominal or intrathoracic procedures and even after operations such as mastectomy and herniorrhaphy, before the patient leaves the operating rooms, on the way to the postoperative recovery room.[3] He observed patients in which despite of multiple routine and documented ''correct'' instrument and sponge counts, foreign bodies were still fund in the cavity operated on, requiring the patient to be transported back onto the operating table and the wound reopened. Therefore, technically, the patient had never left the operating rooms as such, and 6-figure lawsuits were undoubtedly avoided. Similar to Smallwood,[3] Gawande et al[5] suggested routine intraoperative radiographic screening. However, they suggested it only in selected, high-risk categories of operations.

In conclusion, we recommend that the operating teams should ensure that sponges are counted for in any incisional procedures at risk for retaining a sponge. In addition, the surgeon should not unquestioningly accept correct count reports, but should develop the habit of performing a brief but thorough routine post-procedure on wound or body cavity exploration before wound closure. We also recommend screening radiography in patients who are categorized as high-risk.

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