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Gossypiboma: A Diagnostic Challenge but A Surgeon's Nightmare

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ABSTRACT *Retained surgical sponges or instruments especially in the abdominal cavity has always proved to be a disaster for the patient and a nightmare to the surgeon. Understanding the risk factors and natural history of intraabdominal gossypibomas is of utmost importance in both the prevention and treatment of this condition. The legal implications vary depending upon the severity of the disease. A review of the risk factors, pathology, management and preventive measures along with the legal implications is presented.*

Introduction:
The word Gossypiboma or textiloma is usually referred to as a surgical gauze inadvertently left inside the body cavity leading to a multitude of complications. The word is derived from the words "gossypium" in Latin which means "cotton" and the Kiswahili word "boma" which means "a place of concealment."[1] Foreign bodies having left behind accidentally in the abdominal cavity have been described in literature but the exact incidence is inaccurate as majority of such cases go unreported due to the legal implications. [2] Awareness of the condition and its legal implications are pivotal for successful surgical practice.

A review of the etiopathogenesis, clinical features, diagnosis, therapeutic options and legal implications are presented in this article.

Etiology:
A number of foreign bodies have been described, which have been retained in abdominal cavity during the course of a surgical procedure. These include surgical sponge or gauze pieces, towels, artery forceps, pieces of broken instruments or irrigation sets and rubber tubes. Surgical sponge or gauze is the commonest foreign body left behind by virtue of its extensive use, soft and amorphous structure. Studies have identified various circumstantial risk factors for retention of foreign bodies after surgery.[3] These include operations performed on emergency basis, unexpected change during the course of the operation, more than one surgical team involved, change in nursing staff during the procedure, high body mass index, hemorrhage during surgery, female sex and proper count of sponges and instruments performed. All the aforementioned factors point towards situations in which a routine organized flow of events is grossly altered thereby rendering it difficult to maintain accurate count of disposables and instruments.

Pathology:
A retained object elicits a foreign body reaction. The pattern of response of every individual biological system to the retained foreign body is variable. [4] Two pathological patterns have been described. An acute septic form wherein a localized abscess is formed around the retained foreign body giving rise to clinical features of septicemia. Patient with this type of pathology presents early during the course of natural history of disease.

The second pathological pattern is that of aseptic fibrous tissue reaction totally engulfing the foreign body giving rise to pseudo tumor. Patient with the second type of pathological form usually present with obstructive symptoms resembling a tumorous condition. This type of presentation may take a long time to manifest clinically.

Irrespective of the pattern of the pathological process a multitude of sequel usually follow which include sepsis, intestinal obstruction, intra luminal transmigration, fistulization, perforation, and in a few cases even death. [4, 5] The mortality in such cases may range from 15-20 %. [4] Obscure presentation of transmigration in to the lumen of gut followed by per rectal passage of foreign body has also been described. [6]

Clinical features:
The patient may present in two forms. [1] An acute form during which patient may present during first few days to weeks after surgery. Persistent pain, fever, tachycardia, wound complications and ileus may be the presenting features in such cases. In a chronic presentation patient will present with abdominal pain, lump and in advanced cases features of acute intestinal obstruction. This may take a variable period to manifest ranging from moths to years.

Diagnosis:
A high index of suspicion can help in early diagnosis of this condition. Preceding history of a surgical procedure should always raise the suspicion of this condition. Investigations should be carried out at the earliest. Blood investigation may reveal leukocytosis in a few cases.

Radiological investigations have high diagnostic value. [7] A plain X-ray abdomen will reveal a whirl like pattern, characteristic of retained sponges by virtue of entrapment of gas between the fibers. [7] Ultrasound will reveal a well delineated mass containing wave like internal echoes with post acoustic shadowing.[8] CT will reveal a rounded mass with centre surrounded by enhancing wall.[9] MRI may also be performed especially in cases where symptoms are related to upper abdomen. The lesion is typically seen as soft tissue mass with well defined capsule and a whirled internal configuration on T2 weighted images. [7]

Treatment:
Once diagnosed, immediate surgical intervention is the mainstay of treatment. Operative intervention may involve adhesiolysis, drainage and evacuation of abscess cavities, proximal diversion and resection anastomosis. [1] In a few cases where sepsis is a predominant phenomenon, resection anastomosis of the bowel should be accompanied by proximal diversion in order to ensure healing of the anastomosis. [10] Hyper alimentation should be administered in cases wherein extensive internal fistulas are formed. This is particularly

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applicable to proximal fistulas involving the biliary system and the foregut. Mortality is high in cases where multiple internal fistulas are associated with sepsis. [11]

Prevention:

Gossypiboma is a condition where in the standard medical dictum of "prevention is better than cure" holds true. This surgical calamity can be prevented by proper communication between surgeon and supporting staff, followed by accurate counting of all the instruments and disposable items at three points along the course of the surgical procedure. These points include preoperative counting, intra operative confirmation by surgeon that nothing is left inside, followed by post operative confirmation by the staff nurse assisting before commencing closure of the peritoneal cavity.

Use of mops and gauze pieces having radio opaque markers is also of utmost help in preventing such complications. In the event of disparity in count, intra operative X-ray should be done to locate the missing gauze piece. It is the prime responsibility of the chief surgeon to ensure that the counts are confirmed prior to commencing closure.

Another methodology to prevent this complication is by having 3 nurses as a part of the operating team. These include an instrument nurse, who scrubs, prepares and handle sterile equipment for the procedure while providing assistance to the surgeon. A circulatory nurse, who remains unscrubbed on the periphery of sterile field to retrieve supplies and equipment, lastly an anesthetic nurse who may at time offer a helping hand to the circulating nurse. This may help in not only accurate counting but also confirmation that counts are correct.

The traditional method of having a board in operating room still continues to be the best method for preventing retained swabs. The circulatory nurse can keep the count and continuously upgrade the same on the board.

Medico legal implications:

Cases of gossypiboma are grossly underreported in literature. This is due to the fact that it can cause great legal complications to the surgeon who has operated on the patient primarily. [2] A legal litigation in case of retained sponges usually comes under the legal doctrine of res ipsa loquitur, which means "things speak for themselves". [12] The surgeon is left defenseless in such cases.

The onus is on the second surgeon to communicate effectively with the patient and the primary surgeon in order to resolve the dispute. The legal implication of the case depends upon the surgical outcome. Prosecution may take place under various sections of the Indian penal code. [13] Section 336 (rash or negligent act endangering human life), Section 337 (causing hurt to any person by doing any rash or negligent act as would endanger human life) or Section 338 of the IPC (causing grievous hurt to any person by doing any rash or negligent act so as to endanger human life) are the applicable sections . In case of mortality prosecution can take place under Section 304A of the IPC (causing death of any person by doing any rash or negligent act that does not amount to culpable homicide). The best option for primary surgeon is to go for an out of court settlement.

Conclusion:

Gossypiboma is a nightmare to the operating surgeon. Utmost precautions should be taken to prevent this surgical calamity. It is extremely difficult for the surgeon to prove innocence in such cases. A high professional indemnity insurance with out of court settlement is the only option available to get away with the legal complications.

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