INTRA-ABDOMINAL GOSSYPIBOMA EXPLORED : INCIDENCE, CLINICAL PRESENTATION AND TREATMENT OUTCOMES

Uzair Ahmad, Haroon Khan, Muhammad Alam, Zahid Aman

ABSTRACT

Objective: The objective of our study is to highlight the clinical presentation, diagnosis and treatment of gossypiboma: alert surgeons about the morbidity, mortality and medicolegal issues related to this condition and emphasize the recommended preventive measures.

Materials and Methods: Between June 2013 to June 2018 a total number of 20 surgically confirmed cases of gossypiboma operated at surgical department Hayatabad medical complex Peshawar were analyzed retrospectively. All patients were reviewed in terms of demographic variables (age, sex, BMI), diagnosis before initial surgery, clinical presentation, time interval between first operation and definitive surgery, diagnostic modalities, gossypiboma site, definitive operation and postoperative outcome.

Results: Total of 20 patients with 10 (50 %) males and 10 (50 %) females with a median age of 33.65±17 years (16– 50 years) were included in this study. The time peroid of clinical presentation of the patients from first operation to definite operation ranged from 3 days to 132 months. Vague gastrointestinal symptoms including mild abdominal pain, nausea, and vomiting are the common clinical presentations (80 %).

Conclusion: Gossypiboma is unwanted but preventable, serious surgical complication. Abdominal gossypiboma can lead to dreadful complications like gut perforation, intestinal obstruction, fistula formation, sepsis and even death. Adequate precautions should be taken for its prevention.

Keywords: gossypiboma**,** fecal fistula, granuloma

INTRODUCTION

The term gossypiboma is a combination of Latin word "Gossypium" mean cotton and Swahili word "Boma" means place of concealment[1]. It is a bunch in the body cavity formedd by surgical gauze which is encircleded by an inflammatory reaction[1]. Two types of tissue reactions occur in response to gossypiboma i.e. aseptic fibrinous response and exudative response[2].

Gossypibomas were first described by Wilson, an American surgeon in 1884, who published 30 cases happened in USA & Europe and emphasized the severity of the problem[3]. Due to legal and ethical issues concerned with this condition its true incidence is not known but it is a estimated that the occurrence is between 1 in 100 to 1 in 15000 abdominal surgeries. [4,5]. According to Dakuo et al 36% cases of gossypiboma occur after gastrointestinal surgeries, 27% after caesarian sections, 18% after hysterectomies and 13.5% after oncological surgeries[3]. Abdomen and pelvic surgeries, emergency surgery, prolong surgery, operations involving more than 1 major procedures or surgical team, incorrect count, unexpected intraoperative factors and high intraoperative blood loss are some of the factors responsible for higher incidence of gossypiboma.[6,7]

Presentations of patients with gossypiboma is variable which may range from immediate post-operative period to several decades after surgery[4,6]. Clinical presentations may range from mild abdominal pain swelling, fever, vomiting to major surgical complications including intestinal obstruction, viscus perforation, fistula formation, peritonitis, intraluminal migration, sepsis, electrolyte imbalance and death.[1,2,3,5] For the diagnosis of gossypiboma plan x ray film, ultrasound, CT scan, MRI and sometimes endoscopy are helpful.[2,6,8] different measures taken from the prevention of gossypiboma are counting of sponges before and after surgeries, use of gauze with radiopaque markers, tagging gauzes and compressors used in the abdomen, proper examination of operative field and radiograph of abdomen before closure of wound[6].

Although gossypiboma is rare, it should be considered in differential diagnosis of post-operative issues, even if the patient has minor gastrointestinal symptoms[2]. It increases health costs, morbidity and mortality of the patients.[6] because of its potential complications developing measures for prevention of gossypiboma are even more important than discussing its treatment options.[2]

The purpose of our study is to highlight the clinical presentation, diagnosis and treatment of this serious surgical complication: alert surgeons about the morbidity, mortality and medicolegal issues related to this

Department of Surgical "B" unit HMC, Peshawar .....
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Address for correspondence:
Dr. Uzair Ahmad
Specialist Registrar Surgical "B" unit HMC, Peshawar
Email: drahmaduzair1@gmail.com
Contact#: 0332-9203382

condition and emphasize the recommended preventive measures.

MATERIAL AND METHODS

Between June 2013 to June 2018 a total number of 20 surgically confirmed cases of gossypiboma operated at surgical department Hayatabad medical complex Peshawar were reviewed retrospectively. All patients were analyzed in terms of demographic variables (age, sex, BMI), diagnosis before initial surgery, clinical presentation, time interval between first operation and definitive surgery, diagnostic modalities, gossypiboma site, definitive operation and postoperative outcome. In order to confirm the diagnosis of gossypiboma and to exclude other intra-abdominal pathologies different imaging modalities i.e. plain x-ray, ultrasound, CT scan and MRI were used according to the necessity of individual case. Out of 20 cases, gossypiboma was diagnosed preoperatively in 15 cases and in the remaining 5 cases it was only diagnosed intra operatively.

RESULTS

Total of 20 patients with 10 (50 %) males and 10 (50 %) females with a median age of 33.65±17 years (16– 50 years) were included in this study. The patients had no accompanying diseases. All patients had a history of previous operations for various surgical conditions. The previous operations of 18 (90 %) patients were performed by general surgeons, while in 2 (10 %) cases operations were performed by gynecologists. All previous operations were performed at other hospitals, except 4 patients who had primary surgery at surgical department Hayatabad Medical Complex, i-e appendicectomy in 1 patient, APR in 1 patient and exploratory Laparotomy in 2 patients. The time peroid of clinical presentation of the patients from first operation to definite operation ranged from 3 days to 132 months. Vague gastrointestinal symptoms including mild abdominal pain, nausea, and vomiting are the common clinical presentations (80%).The demographic characteristics, previous surgical history, and clinical presentation of the patients are summarized in Table 1.

Preliminary diagnosis varies widely including fecal fistula, wound infection, intra-abdominal tumor, intestinal obstruction etc. However, gossypiboma was always included in the differential diagnosis since we encounter it so often in our clinical experience. Plain X-ray, USG, CT and MRI were used to reach the diagnosis, if necessary. Retained sponge was removed by open surgery in all cases. Gossypiboma was removed from perineal wound side in 1 patient who underwent abdominoperineal resection for carcinoma rectum. Removal of retained sponge was definitive treatment in 14 (70 %) patients whereas, bowel resection and primary anastomosis was performed in 3 (15 %) patients due to fecal fistula or gut perforation. Because of intra-abdominal contamination gut resection and stoma formation was performed in 3(15 %) patients. The most common postoperative complication was Superficial wound infection which was seen in 10 (50 %) cases. 1 patient developed burst abdomen on 5th post-operative day. He was re operated and tension sutures applied.1 patient i-e case # 15 developed serious post-operative complication. He developed fecal fistula due to leakage from repaired site of ileum. She was re explored and perforation was brought out as ileostomy. Post operatively patient showed good recovery. Unfortunately 1 patient i-e case # 2 expired due to intra-abdominal infection on 25th post-operative day (Table 2).

DISCUSSION

The importance of gossypiboma cannot be overemphasized, as it leads to significant complications for the patients as well as embarrassment and medicolegal issues for the surgeon[1]. Literature review shows great variation in the incidence of gossypiboma. Due to fear of litigation every case of gossypiboma is not reported[9]. Literature shows incidence of gossypiboma is 1:1000 to 1:1500 after intraabdominal surgeries[10] and some authors like Noyle[11] , Zabr[12] and Risher[13] have reported its incidence to be 1 in 100 to 5000 operations. Different studies show that its incidence is high in females than males. Our study shows 50% patients were males and 50% females.

Main factors responsible for gossypiboma are emergency surgery, abdomen and pelvic surgery, prolonged surgery, operation involving more than one major procedures or surgical team, unexpected change in surgical procedure, high intra operative blood loss, poor communication between the team members, hurried sponge counts, inexperienced and inadequate staff, unstable patient and obesity[14].In our study 8 (40%) cases of gossypiboma were seen after elective surgeries and 12 (60%) cases after emergency surgeries. Among these 8 elective cases only one case i-e, patient #5 was operated at Hayatabad Medical Complex, remaining 7 cases were operated at other centers and referred to HMC. Bani – Hani et al has reported that 63.6% cases had a history of previous emergency surgeries[15].In a study conducted by Garvande et al, it is noticed that gossypiboma is 9 times more common after emergency surgery and 4 times more common if unexpected changes occurs during operative procedures[16].

Retained surgical gauze can occur after any major surgical operation but it is most commonly seen after laparotomy, hysterectomy, cholecystectomy and appendicectomy[4].Our study shows that gossypiboma was seen in 9 cases of laparotomy,3 cases appendicectomy, 4 cases cholecystectomy, 2 cases total abdominal hysterectomy, 1 cesarean section and 1 case of stoma reversal. Studies conducted by Apter et al[17] and Botel Del Castillo[18] show that gossypiboma is most common after gynecological operations followed by upper abdominal operations.

Table 1: Details of Previous Surgery and Clinical Presentations of Gossypiboma

Case No	Age/ Gender	Initial Diagnosis	Previous Surgery	Time Interval (Months)	Clinical Presentations
1	50/F	Uterine Fibroid	TAH	132	Pain, Fever Abdominal Lump
2	16/F	Ileostomy	Stoma Reversal	4	Pain, Fever, Vomiting
3	30/M	Acute Appendicitis	Appendicectomy	0.1	Fever, Wound Discharge
4	18/M	Acute Appendicitis	Appendicectomy	0.33	Fever, Wound Discharge
5	45/M	Carcinoma Rectum	APR	4	Infected Perineal Wound
6	17/M	SAIO	Laparotomy	5	Pain, Fever, Vomiting
7	35/F	PUH + Gall Stones	Mesh Repair + Open Cholecystectomy	6	Discharge from Wound
8	30/M	FAI	Laparotomy	9	SAIO
9	27/F	Acute Appendicitis	Appendicectomy	7	Pain, Fever, Abdominal Lump
10	35/M	Acute Abdomen	Laparotomy	7	SAIO
11	50/F	Gall Stones	Open Cholecystectomy	24	Pain, Fever, Abdominal Lump
12	30/F	Full Term Pregnancy	Caesarean Section	18	Pain, Fever, Abdominal Lump
13	45/M	Gall Stones	Open Cholecystectomy	36	SAIO
14	30/M	Blunt Abdominal Trauma	Laparotomy	24	Lump, Pain, Fever
15	50/F	Ovarian Cyst	Laparotomy	48	SAIO
16	25/F	FAI	Laparotomy	16	Pain, Fever
17	35/F	Acute Abdomen	Laparotomy	40	SAIO
18	40/M	Acute Abdomen	Laparotomy	30	Pain, Fever, Vomiting
19	40/F	DUB	TAH	24	Pain, Fever, Vomiting
20	25/M	Intussception	Laparotomy	12	SAIO

Patients with retained sponge present with variable clinical symptoms which depend upon the location and tissue reaction in response to gossypiboma. There are two varieties of foreign body reactions i-e,an exudative inflammatory response which leads abscess or fistula formation and aseptic fibrinous reaction leading to adhesions, encapsulation and ultimately granuloma formation[19,20,21]. Aseptic fibrinous reaction presents clinically much later than the former one. Patients with aseptic fibrinous reaction commonly remain asymptomatic or present clinically with pseudotumor syndrome. Nausea, fever, vomiting, palpable mass, abdominal distension, diarrhea, tenesmus, anorexia, weight loss and dehydration are some of the signs and symptoms caused by gossypiboma. Transluminal migration of abdominal gossypiboma can occur into different organs like stomach, small bowel, colon or urinary bladder with no obvious opening in their walls[17].Apart from abdominal cavity which is the most common site for gossypiboma, other sites of the body like paraspinal space, pararenal space, vagina, nose, breast, tracheobronchial tree, femur etc may be involved. We have included only intra-abdominal gossypiboma in our study. Retained surgical swab may lead to serious

Table 2: Diagnostic modalities, preliminary diagnosis, operation and postoperative complications of the patients after gossypiboma surgery.

Case	Diagnostic Modalities	Preliminary Diagnosis	Operation	Postoperative Complications
1	X-ray, USG	Gossypiboma	Removal + Ileal Resection with Primay Anastomosis	Wound Infection
2	X-ray, USG, CT	Gossypiboma	Removal + Small gut Resection with Stoma Formation	Expired due to intra-abdominal infection on 25th post-operative day
3	None	Fecal Fistula	Removal	Wound Infection
4	X-ray, USG, CT	Gossypiboma	Removal	Wound Infection
5	USG, CT	Gossypiboma	Removal	Wound Infection
6	X-ray, USG, CT	Gossypiboma	Removal	Uneventful Recovery
7	USG	Wound Infection	Removal + Ileostomy	Wound Infection
8	X-ray, USG , CT	Gossypiboma	Removal	Uneventful Recovery
9	USG	Wound Infection	Removal	Uneventful Recovery
10	X-ray, USG, CT	Gossypiboma	Removal + Small gut Resection with Primay Anastomosis	Wound Infection
11	USG, CT	Gossypiboma	Removal	Wound Infection
12	X-ray, USG, CT	Gossypiboma	Removal	Uneventful Recovery
13	USG, CT	Gossypiboma	Removal	Wound Infection
14	X-ray, USG	Intestinal Obstruction	Removal	Uneventful Recovery
15	USG, CT	Gossypiboma	Removal + Small gut Resection with Primary Anastomosis	Re-laparotomy ileostomy due to anastomotic leakage
16	X-ray, USG, CT	Gossypiboma	Removal + Right Hemicolectomy with Stoma Formation	Wound Infection
17	X-ray, USG, CT	Intra-Abdominal tumor	Removal	Wound Infection
18	USG, CT	Gossypiboma	Removal	Uneventful Recovery
19	USG, CT	Gossypiboma	Removal	Uneventful Recovery
20	X-ray, USG, CT	Gossypiboma	Removal	Tension sutures due to burst abdomen

complications like gut perforation, malabsorption, fistula formation, intestinal obstruction, peritonitis, septicemia or even death[22,23].In our study retained gauze was stuck to bowel wall leading to perforation/ fistula formation in 6 (30%) cases while in remaining 14 (70%) cases it was found adherent to bowel wall or other visceral structures without causing any serious complications.

Different imaging modalities like plain x-ray, ultrasound, CT scan, MRI etc. are the main tools for the diagnosis of gossypiboma[24]. If the retained sponge contain radiopaque marker it can be easily detected on plain x-ray. Another diagnostic feature on plain x-ray is characteristic whorl like pattern. Ultrasound characteristics suggestive of gossypiboma are well outlined mass containing a wavy internal echo with a hypoechoic ring and a strong posterior acoustic shadow[25].Among all the diagnostic modalities CT scan is the investigation of choice for the detection of gossypiboma and its complications. Spongiform pattern with gas bubbles is the typical picture of retained swab on CT scan[25]. MRI is not routinely used unless the diagnosis is going towards malignancy and also the radiopaque marker is not magnetic or paramagnetic[26].The specificity of plain x-ray, Ultrasound and CT scan is 35,34 and 61% respectively in the diagnosis of gossypiboma[2].In our study preoperative diagnosis of gossypiboma could be reached in 15(75%) patients through various imaging techniques. Ultrasonography was done in all patients except case # 3.This patient was operated for acute appendicitis at other hospital through grid iron incision.

On third post-operative day there was foul smelling purulent discharge from the wound with clinical suspicion of fecal fistula. Operative findings were retained sponge with frank pus. CECT of abdomen and pelvis was done in 15 cases. In all cases findings were suggestive of gossypiboma and its complications except case #17 in which findings were suggestive of intra-abdominal mass but per operative it was retained sponge.

Retained sponge is usually removed through laparotomy but in literature other techniques are also mentioned. Childers and Caplinger[27] have mentioned removal of retained swab laparoscopically whereas percutaneous removal of intraabdominal retained swab has been achieved by interventional radiologist successfully. In our study retained swab was removed through open surgery. In 19 cases this was through abdominal approach while in 1 case it was through perineal approach. This patient had history of APR for rectal cancer. After 4 months he presented with infected perineal wound with nodular appearance. Pelvic CT scan was done to exclude recurrence of the disease with the presumption that it was an aggressive tumor. PR was done in our unit. When the record of first surgery was reviewed, we came to know that there was profuse bleeding during APR , for which presacral packing was done. After 48 hours packs were removed in emergency OT in the evening.

The time period between initial operation to gossypiboma removal surgery ranges from 6 months to 7 years[28].In our study time interval was 3 days to 132 months. In our study post-operative wound infection was seen in 10 (50%) cases.1 patient developed burst abdomen on 5th post-operative day. He was re operated and tension sutures applied.1 patient i-e case # 15 developed serious post-operative complication. He developed fecal fistula due to leakage from repaired site of ileum. She was re explored and perforation was brought out as ileostomy. Post operatively patient showed good recovery. Unfortunately 1 patient i-e case # 2 expired due to intra-abdominal infection on 25th post-operative day.Morbidity and mortality after removal of retained sponge is at high rate of 50% and 11 to 35 % respectively[29].Our study shows (60%) and (5%) respectively.The most common reason for this is intra-abdominal abscess formation as seen in our patient. For this reason urgent surgical exploration should be performed to prevent further complications.

CONCLUSION

Gossypiboma is an unwanted but preventable, serious surgical complication. Patient with gossypiboma are usually asymptomatic or present with nonspecific symptoms like nausea, vomiting, fever and persistent wound infection. For this reason the diagnosis is often delayed. Retained swab should be included in the differential diagnosis of any post-operative patient who present with above symptoms. Although we are living in modern era, gossypiboma is still a major post-operative problem which needs solution. Abdominal gossypiboma can lead to dreadful complications like gut perforation, intestinal obstruction, fistula formation, sepsis and even death. Beside this it can lead to serious medicolegal issues. Adequate precautions should be taken for its prevention. In order to prevent gossypiboma radiological markers should be used and routine pre and post-operative sponge count should be done. When gossypiboma is diagnosed, it should be removed as soon as possible either to prevent further complications or to resolve medicolegal issues related to it. Usually it is removed through open technique. Depending upon its location and condition of the patient minimal invasive techniques like Endoscopy and Laparoscopy may be tried.

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