

Post Cholecystectomy Gossypiboma Mimicking a Liver Hydatid Cyst: Comprehensive Literature Review

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Background: Gossypiboma is the term for forgotten textile products such as a surgical sponge and compress in the body cavity after a surgical procedure.

Objectives: The aim of this study was to evaluate previously published articles related to post cholecystectomy gossypiboma.

Materials and Methods: We conducted a systematic search using PubMed, Medline, Google and Google Scholar on post cholecystectomy gossypiboma. The keywords used were: gossypiboma and cholecystectomy, textiloma and cholecystectomy and post cholecystectomy gossypiboma. Furthermore, we also present a new case of post cholecystectomy gossypiboma.

Results: A total of 32 articles concerning 38 patients with post cholecystectomy gossypiboma that met the aforementioned criteria were included. Detailed intraoperative findings and surgical management were provided. The patients were aged from 26 to 79 years (Mean \pm SD: 47 \pm 13.6 years); 32 were female and six were male. The time from the causative operation to presentation with a retained surgical sponge ranged from one to 480 months (Mean \pm SD: 56.5 \pm 93.5 months).

Conclusions: Gossypiboma may not be symptomatic for many years or could be symptomatic for a short duration of time. Besides being a rare surgical complication, gossypiboma can lead to serious morbidity and mortality that may cause medico-legal problems. Diagnosis with imaging methods is difficult.

Keywords: Cholecystectomy; Surgical Sponges; Cysts, Hepatic Hydatid

1. Background

Gossypiboma, also known as retained foreign body, is an uncommon but serious complication following surgical interventions (1-5). Gossypiboma is used to describe a retained surgical sponge in the body compartment after surgery. This complication is frequently reported after abdominopelvic surgery, yet it can occur following any surgical procedure including thoracic, orthopedic, urological and neurosurgical procedures (1-8). The most important risk factors for retained foreign body are emergency surgery, unplanned change in the operation, and high body mass index. Clinical symptoms both in the early postoperative period as well as in the months or years following the initial surgery are often nonspecific (1, 9-14). Most clinical symptoms are depend on the sponge location, foreign body reaction and relationship between sponge and adjacent organs such as duodenum, stomach, intestine and liver.

2. Objectives

The primary aim of this study was to analyze cases of post cholecystectomy gossypiboma published in the medical literature before the 10th of July 2014. The secondary aim was to report a case of a 41-year-old female

patient who was diagnosed with post-cholecystectomy gossypiboma.

3. Materials and Methods

We conducted a systematic literature search of PubMed, Medline, Google Scholar and Google databases using the following term, surgical sponge and cholecystectomy, gossypiboma and cholecystectomy, textiloma and cholecystectomy, and post cholecystectomy gossypiboma (alone or in different combinations). All identified abstracts, case reports, letters to the editor, review articles, original articles, and other documents were reviewed. The publication language was not an exclusion criterion, and studies published before 10th of July 2014 were included. Reference lists of the retrieved articles were also examined to identify citations that complied with our inclusion criteria. Corresponding authors of the articles were contacted by email to obtain more detailed information about the patients. Articles without an accessible full-text version or those providing insufficient information or insufficient data for comparison with other studies were excluded. Table 1 presents the following information: first author surname, year of publication, age, sex, initial surgery, interval between surgery and diagnosis (months), preliminary diagnosis, intraoperative findings and surgical approaches.

Table 1. Summary of Thirty-two Articles Related to Gossypiboma Following Cholecystectomy in the Literature Published Between January 2000 and July 2014

References	Year	Age	Gender	Initial Surgery	Interval, mon	Preliminary Diagnosis	Surgery	Intraoperative Findings
Lv et al. (3)	2014	61	M	Cholecystectomy	10	Gossypiboma	Sponge was removed and the penetrated ulcer was repaired with duodenorrhaphy	Sponge migrated to the duodenum
Sistla et al. (4)	2014	37	F	Cholecystectomy	5	Gossypiboma	Fistula excision + primary duodenal repair + feeding jejunostomy	Sponge migrated to the duodenum Duodenocolic fistula
Aljehani et al. (5)	2013	36	F	Cholecystectomy	48	Sterile abscess	Complete excision + drainage	Gossypiboma mimicking cystic lesion
Kohli et al. (6)	2013	35	F	Cholecystectomy	2	Gastro-cutaneous fistula	Sponge was removed with gastric wall repair + feeding jejunostomy	Gastro-cutaneous fistula sponge migrated to the stomach
Mostafa and Elsani (7)	2013	42	F	Cholecystectomy	6	Gastric outlet obstruction	Sponge was removed with gastrostomy	Sponge migrated to the stomach
Singhal et al. (8)	2013	40	F	Cholecystectomy	24	Intestinal obstruct.	Sponge was removed with enterotomy (ileum)	Sponge migrated to the small bowel
Sozutek et al. (9)	2013	52	F	Cholecystectomy + T-tube drainage	12	Gastric mass + gossypiboma	Sponge removed with gastroscopy without surgery	Sponge migrated to the stomach
Shekhar et al. (10)	2013	30	F	Cholecystectomy	12	Gastric outlet obstruction + gossypiboma	Distal gastrectomy + Billroth II anastomosis	Sponge migrated to the stomach
Aydogan et al. (11)	2012	51	F	Cholecystectomy	240	Intestinal obstruct.	Sponge was removed with enterotomy (ileum)	Sponge migrated to the small bowel
Malhotra (12)	2012	45	F	Cholecystectomy + hysterectomy	30	Iatrogenic intestinal perforation	Ileal mass resected + end-to-end ileoileal anastomosis.	Sponge migrated to the small bowel
Erbay et al. (13)	2012	63	F	Cholecystectomy	48	Gossypiboma + gastric mass	Sponge was removed with gastric wall repair	Sponge migrated to the stomach
Rizman et al. (14)	2011	40	F	Cholecystectomy	6	Gastric outlet obstruction + gastric mass	Sponge removed with gastroscopy without surgery	Sponge migrated to the stomach
Fragulidis et al. (15)	2011	57	M	Cholecystectomy + appendectomy	180	Hydatid cyst	Complete excision	Subhepatic gossypiboma
Duman et al. (16)	2011	51	F	Cholecystectomy	96	Hydatid cyst	Complete excision + PAIR for hydatid cyst	Four sponges found in gossypiboma lesion
Ray and Das (17)	2011	54	F	Cholecystectomy	84	Gossypiboma	Lesion was removed along the adhered transverse colon	Subhepatic gossypiboma
Rajalingam et al. (18)	2011	35	F	Cholecystectomy	96	Gall bladder cancer + choledochal cyst	Completion of cholecystectomy + choledochal cyst excision + Roux-en-y hepaticojejunostomy + complete excision of the gossypiboma	Subhepatic gossypiboma + choledochal cyst + incomplete gall bladder
Sozutek et al. (19)	2010	64	F	Cholecystectomy + surrenalectomy	144	Complicated hydatid cyst	Complete excision + drainage	Suprahepatic gossypiboma
Alegre-Salles et al. (20)	2010	48	F	Cholecystectomy	24	Intestinal obstruct.	Sponge was removed with gastrostomy	Sponge migrated to the stomach
Alayo et al. (21)	2010	27	F	Cholecystectomy	6	Microperforation + foreign body	Nonsurgical management	Sponge spontaneously passed with the stool
Ozyer and Boyvat (22)	2009	58	F	Partial cholecystectomy	4	Intestinal obstruct.	Sponge removed with sigmoidoscopy without surgery	Sponge migrated to the colon
Sharma et al. (23)	2008	30	F	Cholecystectomy	10	Small bowel mass	Resection + anastomosis	Jejunocolic fistula
Erdil et al. (24)	2008	55	F	Cholecystectomy + PEG	12	Gastrointestinal bleeding	Sponge was removed with gastroscopy without surgery	Sponge migrated to the duodenum

Kansakar et al. (25)	2008	55	F	Cholecystectomy	168	Gossypiboma	Resection + anastomosis	Sponge migrated to the ileum and ileoileal fistula occurred
Agarwal et al. (26)	2008	40	F	Cholecystectomy	18	Intestinal obstruct.	Sponge removed with jejunal enterotomy	Sponge migrated to the jejunum
Sarda et al. (27)	2007	26	F	Cholecystectomy	8wk	Gastric outlet obstruction	Sponge was removed with gastroscopy without surgery	Sponge migrated to the stomach
		32	F	Cholecystectomy + tubal ligation	4	Intestinal obstruct.	Complete excision + adhesiolysis	Sponge surrounded by mesentery
Yildirim et al. (28)	2006	46	F	Cholecystectomy	36	Gossypiboma	Complete excision	Subhepatic gossypiboma
		39	M	Cholecystectomy	27	Gossypiboma	Complete excision	Subhepatic gossypiboma
		71	M	Cholecystectomy	480	Hydatid cyst	Complete excision	Subhepatic gossypiboma
		64	M	Cholecystectomy	216	Gossypiboma	Complete excision	Subhepatic gossypiboma
		79	F	Cholecystectomy + Choledocoduodenostomy	1	Abscess	Complete excision	Interloop gossypiboma
Tiwary et al. (29)	2005	35	F	Cholecystectomy	3	Gastric outlet obstruction	Sponge was removed with gastrostomy	Sponge migrated to the stomach
		30	F	Cholecystectomy	4,5	Gastric outlet obstruction	Sponge was removed with gastrostomy	Sponge migrated to the stomach
Ersoy et al. (30)	2004	61	F	Cholecystectomy	12	Gossypiboma	Complete excision	Gossypiboma mimicking cystic lesion
Gencosmanoglu and Inceoglu (31)	2003	74	F	Cholecystectomy + hernia repair	36	Gossypiboma	Resection + anastomosis (jejunal segment)	Sponge surrounded by mesentery + Jejuno jejunal fistula
Puri et al. (32)	2002	32	F	Cholecystectomy	8	Intestinal obstruct + gossypiboma	Resection + anastomosis (jejunal segment)	Sponge migrated to the jejunum
Manikyam et al. (33)	2002	44	F	Cholecystectomy	24	Gastric outlet obstruction + Bezoar	Right hemicolectomy + duodenal repair	Duodeno-ileo-colic fistula
Dux et al. (34)	2002	47	M	Cholecystectomy	10	Gossypiboma	Resection + anastomosis (jejunal segment)	Sponge migrated to the duodenum + duodenal fistula

4. Results

4.1. Literature Review

A literature search using the above review criteria retrieved a total 32 articles on post-cholecystectomy gossypiboma. The studies involved 38 patients with post-cholecystectomy gossypiboma: 32 patients were female and six patients were male, with ages ranging from 26 to 79 years (mean \pm SD: 47 ± 13.6 years). The time from the causative operation to presentation with a retained surgical sponge ranged from one to 480 months (mean \pm SD: 56.5 ± 93.5 months). Detailed intraoperative findings and surgical management are provided in Table 1.

4.2. Case Report

A 41-year-old female patient was admitted to our hospital with complains of occasional abdominal pain. She had undergone open cholecystectomy for cholelithiasis fifteen years ago. Physical examination revealed no significant findings apart from previous right subcostal surgical incision. On contrast-enhanced abdominal

computed tomography; stages 4 - 5 hydatid cyst, about 8 cm in diameter, accompanied by calcification on sub-diaphragmatic surface at segment 7 - 8 of the liver was detected (Figure 1). The patient underwent laparotomy with a preliminary diagnosis of hydatid cyst. After Adhesions secondary to previous operations were separated, the lesion located between the liver and diaphragm was detected. The lesion was aspirated with a veress needle and then filled with povidone iodine and povidone iodine embedded compress was placed around the lesion. When the lesion was opened, dark yellow abscess content was noticed and aspirated. A surgical compress or towel having partially corrupted fibrous structures was detected within the lesion (Figure 2). Lesions were 9 - 10 pieces with different sizes. All lesions were completely cleared. A drain was placed before terminating the operation. The drain was pulled out on the third postoperative day. The patient recovered without complications and remained well and symptom-free for at least 8 months after discharge.



Figure 1. Contrast-Enhanced Abdominal Computed Tomography Showing a Large Cystic Mass (Hydatid Cyst) Lesion Located on the Subdiaphragmatic Surface at Segment 7 - 8 of the Liver



Figure 2. Postoperative View of Surgical Sponge Removed From Cystic Lesion Located on the Subdiaphragmatic Surface of the Liver

5. Discussion

Gossypiboma is a forgotten surgical material after surgery in the body that consists of non-absorbable textile products (1-5). The term “gossypiboma” is derived from the Latin term *gossypium* (“cotton wool, cotton”) and the suffix *boma* (concealment). It was described by Wilson for the first time in 1884 (2). It is also called *textiloma*, *gauzoma* or *muslinoma* (3). Gossypiboma is a rare complication of surgery, but leads to serious medico-legal problems between patients and doctors and because of this, it should be considered important. Gossypiboma is most commonly seen after abdominopelvic cavities surgery, but it can also follow thoracic, orthopedic, urologi-

cal and neurosurgical procedures (2, 4, 33).

Clinical symptoms related to intra-abdominal gossypiboma are variable. While it may remain asymptomatic; it can present in a wide range of clinical statuses such as abdominal pain, nausea, vomiting, tenesmus, diarrhea, gastrointestinal hemorrhage, fistula formation, intestinal obstruction, gastric outlet obstruction, transmural luminal migration, visceral perforation, abscess or sepsis, in terms of radiological features (13, 14, 26, 35). Diagnosis is not possible with physical examination, laboratory test and radiologic tools. The most important factor that arouses suspicions is the patient’s history of previous surgery.

Preoperative diagnosis is very difficult. Radiologic manifestations depend on sponge location, foreign body reaction and presence of a radiopaque marker (2). Correct preoperative diagnosis can be made for only one-third of cases (3). Radiological procedures such as X-ray, ultrasound, computed tomography, magnetic resonance imaging, barium enema studies and endoscopic instruments may be helpful (33). If the retained surgical swab is marked with radioactivity, diagnosis to locate is fairly easy by X-ray. As shown in the case presented in this study, it may lead to similar image interpretation as hydatid cyst. Due to the number of undetected asymptomatic cases and cases that are not reported because present malpractice laws lead to medico-legal problems, the true incidence of gossypiboma is not fully known. According to available statistics frequency of gossypiboma is one in 100 - 5000 surgical operations and one in 1000 - 1500 abdominal operations (5, 33). Fifty-two percent of cases have been seen after abdominal surgery, 22% after gynecological surgery, 10% after urological/vascular surgery, and 6% after orthopedic/spinal surgery. Contrary to expectations, 30% of reported cases are seen after emergency surgery, while 70% were observed after elective surgery (3). Risk factors are obesity, emergency surgical operations and unplanned changes of the team (1, 6). The sponges are often forgotten surgical foreign bodies (7, 8). Sponges or compresses suck blood in a short time and their colors change and thus can be overlooked. While these textile products can give clinical findings as soon as possible, by an abscess, many remain sterile and become focus of granuloma and create a mass. Gossypiboma may cause transmural migration, perforate the visceral organs or lead to lumen obstruction (9). The treatment of gossypiboma, unquestionably, is by removal. In some patients, after cholecystectomy, transmural migration of sponge to the stomach has been reported and some were removed endoscopically (10-13). Without distinction between elective or emergency surgery, sponges and compresses should be counted exactly. During surgery, care must be taken not to use small and unmarked tampons. Nurses should be warned to count sponges and compresses during nursing team changes. When closing the incision, the surgeon must be sure that all used sponges and compresses are counted. Before closing the surgical

field in suspected cases, surgical fields should be checked carefully and marked sponges should be checked with radiography. As a result, for prevention of gossypiboma in surgery, all operating staff should pay attention to this preventable surgical complication.

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Authors' Contributions

Study concept and design: Yusuf Yagmur and Sami Akbulut. Analysis and interpretation: Sami Akbulut. Drafting of the manuscript: Sami Akbulut and Serdar Gumus. Critical revision of the manuscript for important intellectual content: Yagmur and Sami Akbulut.

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