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The results of patients with histopathological diagnosed xanthogranulomatous cholecystitis: A single-center experience

Ali Avanaz[a,*], Ulas Aras[a]

[a] *Akdeniz University, Faculty of Medicine, Department of General Surgery, Antalya, Türkiye*

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Abstract

Aim: Xanthogranulomatous cholecystitis (XGC) is a rare and benign gallbladder disorder. Unnecessary or additional surgical interventions were reported secondary to extended inflammation or suspicion of malignancy. This study aimed to examine patients diagnosed with XGC in our clinic.

Materials and Methods: The data of patients were recruited who underwent cholecystectomy and diagnosed with XGC. We excluded patients with no radiologic examination, accompanying pancreas, biliary tree, and hepatic cancer. We recruited the data of patients' demographics, clinical symptoms, imaging studies, characteristics of surgery, and postoperative outcomes.

Results: The mean age was 57 ±19.1 years, and there were 12 (31%) females. Abdominal pain was found in 38 (97%) patients as a significant complaint. Elective and emergent cholecystectomy were performed in 18 (46%) and 21 (54%) patients, respectively. Open surgery was performed on 17 (44%) patients, and laparoscopic surgery on 22 (56%). The surgery was completed as laparoscopic in 17 (77%) patients. According to radiologic examinations, suspicious gallbladder malignancy was reported in 4 (10%), 8 (20%), and 4 (10%) patients with USG, CT, and MRI, respectively. There was 1 (3%) patient diagnosed with XGC by USG, 4 (10%) by CT, and 1 (3%) by MRI. Common bile duct (CBD) stone was observed in 10 (26%) of 39 patients. Conversion to open surgery was found in 5 (13%) patients. Intraoperative frozen section analysis was performed in 8 (20%) patients. Extended surgery was performed to 7 (17%) patients.

Conclusion: Preoperative diagnosis and surgical management of XGC can be challenging. If a surgeon has suspicion of XGC in preoperative period, expert radiologist opinion should be asked, and they should always keep in mind to perform frozen-section examination.

Introduction

Xanthogranulomatous cholecystitis (XGC) is a rare and benign gallbladder disorder characterized by macrophage-laden and foamy histiocytes infiltration with marked proliferative fibrosis [1,2].

Progressive fibrosis may advance to neighboring tissues, which makes it harder to differentiate XGC from gallbladder cancer by radiologic examinations [1]. For a definite diagnosis of XGC, a histopathologic examination is necessary [3].

Many studies reported that unnecessary or additional surgical interventions were performed on patients pathologically diagnosed with XGC due to preoperative suspicion of malignancy or the spread of inflammation to neighboring tissues [2,4-6].

This study aimed to examine patients diagnosed with XGC by pathologic analysis, reveal our approach, and compare with the literature.

Materials and Methods

We retrospectively analyzed the data of patients older than 18 years who underwent cholecystectomy between January 2017 and December 2022 and were diagnosed with XGC in the pathologic specimen. We found 132 patients who were diagnosed with XGC. We excluded patients with no radiologic examination that was performed in our center, and who had an accompanying pancreas, biliary tree, and hepatic cancer. We meticulously reviewed our patients' medical records and made the necessary exclusions. As a result, we excluded 9 patients due to non-gallbladder malignancy and 45 patients because radiological examination was not performed in our center. We obtained the ethical approval for this study from Akdeniz University Institu-

*Corresponding author:
Email address: aliavanaz@hotmail.com (Ali Avanaz)

tional Ethics Committee (25.01.2024/1). There were 39 patients presented in the present study. We recruited the data of patients' age, gender, preoperative clinical symptoms, preoperative imaging studies, preoperative biliary interventions, characteristics of surgery, and postoperative outcomes using the Clavien-Dindo classification.

Statistical analysis

We performed statistical analyses using the Statistical Package for Social Sciences (SPSS) for Windows version 23.0 (IBM, Armonk, NY, USA). Categorical variables were presented as numbers and percentages. The Kolmogorov–Smirnov test was used to evaluate the normality of continuous data. Normally distributed continuous data were presented as mean and standard deviation (SD). No statistical comparison was performed nor a p-value determined as there were no patient groups in the present study.

Results

The mean age was 57 ±19.1 years, and there were 12 (31%) females. Abdominal pain was found in 38 (97%) patients as a significant complaint. Nausea or vomiting and fever were found in 17 (44%) and 10 (26%) patients, respectively. We found that 35 (90%) patients were evaluated with abdominal ultrasonography (USG), 39 (100%) with contrast-enhanced abdominal computed tomography (CT), and 11 (28%) with abdominal magnetic resonance imaging (MRI). According to radiologic examinations, suspicious gallbladder malignancy was reported in 4 (10%), 8 (20%), and 4 (10%) patients with USG, CT, and MRI, respectively. There was 1 (3%) patient diagnosed with XGC by USG, 4 (10%) by CT, and 1 (3%) by MRI. Preoperative endoscopic retrograde cholangiopancreatography (ERCP) was performed on 16 (41%) patients in the preoperative period, and 9 (56%) of them had choledocholithiasis. Common bile duct (CBD) stone was observed in 10 (26%) of 39 patients (Table 1).

Table 1. Demographic, preoperative and operative characteristics of the XGC patients.

Age, years	57 ±19.1
Gender, n (%)	
Female	12 (31)
Male	27 (69)
Complaints, n (%)	
Nausea or vomiting	17 (44)
Abdominal pain	38 (97)
Fever	10 (26)
Preoperative imaging studies, n (%)	
USG	35 (90)
CT	39 (100)
MRI	11 (28)
Malignancy suspicion, n (%)	
USG	4 (10)
CT	8 (20)
MRI	4 (10)
XGC diagnose, n (%)	
USG	1(3)
CT	4 (10)
MRI	1(3)
Preoperative ERCP, n (%)	16 (41)
CBD stone, n (%)	10 (26)
Surgical condition, n (%)	
Elective	18 (46)
Emergent	21 (54)
Surgical procedure, n (%)	
Laparoscopic	22 (56)
Open	17 (44)
Conversion to open surgery, n (%)	5 (13)
Intraoperative frozen section, n (%)	8 (20)

CBD, common bile duct; CT, computed tomography; ERCP, endoscopic retrograde cholangiopancreatography; MRI, magnetic resonance imaging, XGC, xanthogranulomatous cholecystitis. Parametric data is presented as mean ± standard deviation.

Elective and emergent cholecystectomy were performed in 18 (46%) and 21 (54%) patients, respectively. Open surgery was performed on 17 (44%) patients, and laparoscopic surgery on 22 (56%). The surgery was completed as laparoscopic in 17 (77%) patients. Conversion to open surgery was found in 5 (13%) patients. Intraoperative frozen section analysis was performed in 8 (20%) patients (Table 1). Conversion to open surgery decisions were performed secondary to dense adhesions and inflammation in 4 patients and duodenal injury in one patient. Primary duodenal repair was performed in 2 (5%) patients secondary to fistula formation under laparoscopy. Left extended hepatectomy was performed in 2 (5%) patients, hepaticojejunostomy or choledochojejunostomy in 3 (8%) patients, and gallbladder bed resection in 2 (5%) patients. All surgical procedures are shown in Table 2.

The Clavien-Dindo classification was used to classify the patients according to the severity of their postoperative complications. Out of the total number of patients, 27 (69%) were identified as grade 1, which does not require special treatment. Only 2 (5%) patients were classified as grade 2, meaning they experienced moderate complications requiring pharmacological treatment. Eight (21%) patients were classified as grade 3, which indicates that they encountered severe complications that required surgical, endoscopic, or radiological intervention. Lastly, only 2 (5%) patients were classified as grade 4, which means that they faced life-threatening complications that required intensive care unit management. The majority of the patients with intraabdominal complications had an abscess formation. Postoperative ERCP was performed in 2 (5%) patients for choledocholithiasis and bile leak suspicion. Postoperative complications are detailed in Table 3.

Discussion

Xanthogranulomatous cholecystitis is a rare disorder of the gallbladder. Its incidence ranged between 0.7% and 13.2% [7,8]. The definitive treatment of XGC is cholecystectomy,

Table 2. Type of the surgical procedures which was performed in XGC patients.

Surgical procedure	n (%)
Open cholecystectomy	11 (28.2)
Open cholecystectomy + hepaticojejunostomy	1 (2.6)
Open cholecystectomy + choledochojejunostomy	1 (2.6)
Open cholecystectomy + hepaticojejunostomy + pancreas biopsy	1 (2.6)
Open cholecystectomy + GBR	1 (2.6)
Lap. cholecystectomy+ primary duodenal repair	2 (5.1)
Lap. cholecystectomy	15 (38.5)
Conversion to open surgery	4 (10.3)
Conversion to open surgery + GBR	1 (2.6)
Left extended hepatectomy	1 (2.6)
Left extended hepatectomy + hepaticojejunostomy	1 (2.6)

GBR, gallbladder bed resection; Lap, laparoscopic; XGC, xanthogranulomatous cholecystitis.

Table 3. The postoperative complications observed in XGC patients.

Clavien-Dindo classification	n (%)
Grade 1 complication	27 (69.2)
Grade 2 complication	
Wound infection	2 (5.1)
Grade 3 complication	8 (20.5)
Intraabdominal abcess	5 (12.8)
Choledocholithiasis	2 (5.1)
Bile leak	1 (2.6)
Grade 4 complication	2 (5.1)
Respiratory sepsis	1 (2.6)
Pulmonary embolism	1 (2.6)

and a definitive diagnosis can be made with a pathologic examination. Xanthogranulomatous cholecystitis is commonly seen between the sixth and seventh decades and male preponderance has previously been reported in XGC, and most series quote at least a 1:1 ratio of males to females [9,10]. Clinical symptoms of XGC are similar to acute or chronic cholecystitis. Those are abdominal pain, jaundice, anorexia, fever, nausea, and vomiting [5,6]. In the present study, the mean age was 57, and gender disturbance was dominant in males. We observed that abdominal pain was the primary clinical symptom, then nausea or vomiting was the following.

A laparoscopic approach can be performed if there is no suspicious malignancy in preoperative imaging studies. Laparoscopic cholecystectomy can be challenging due to inflammation and adhesion. Conversion to open surgery rates were reported between 10% to 80% [6,7,9,11,12]. Open cholecystectomy is the preferred surgical approach if there is suspicious gallbladder cancer, dense fibrous adhesion, and excessive local inflammation. Frozen section analysis was recommended for differentiating XGC and gallbladder cancer to avoid extended surgery [6]. In the present study, laparoscopic cholecystectomy was performed in 22 (56%) patients, and the conversion to open surgery rate was 13%. Open surgery was performed in 17 (44%) patients. Accompanying choledocholithiasis, liver abscess, prior laparotomy, gallbladder perforation, and malignancy suspicion were the reasons for selecting an open surgical approach. Extended surgical procedures were performed in 4 (10%) patients. Makimoto et al. [6] reported that 3 of 31 (9%) patients underwent extended surgery.

Severe complication rates after surgery in XGC patients were reported between 2.6% to 23% [6,11,13]. In the present study, the complication rate was slightly higher than in the current literature. Clavien-Dindo grade 3 and grade 4 complications were seen in 10 (26%) patients; 2 patients suffered from respiratory complications, and eight patients suffered from intraabdominal complications.

Radiologic imaging studies can help to diagnose XGC and to rule out gallbladder cancer. However, a pathologic examination is needed for a definitive diagnosis. The presence of diffuse wall thickening and intramural hypoechoic nodule formation in the gallbladder on USG examination were pathognomonic for XGC [3]. The sensitivity and specificity of CT was reported between 67%-78% and 22%-33% to differentiate acute cholecystitis and XGC from gallbladder cancer [14]. Lee et al. [15] reported that MRI is the best tool to differentiate XGC from gallbladder cancer compared to CT and USG, with 93.3% sensitivity and 78.9% to 84.3% specificity. Azari et al. [13] reported that preoperative concern for malignancy on cross-sectional imaging was 12%, and suspicion for XGC by an imaging study was 24% in histologically proven XGC patients. Takeda et al. [16] reported that the preoperative diagnosis was gallbladder cancer in 24% of the patients, XGC in 7%, and cholelithiasis or cholecystitis in the remaining. In the present study, definitive diagnosis of XGC was performed via USG, CT, and MRI in 3%, 3%, and 0% of the patients, respectively, and suspicious gallbladder malignancy was reported via USG, CT, and MRI in 10%, 20%, and 10% of the patients, respectively. Additionally, a radiologist reported most of the imaging studies as acute cholecystitis.

Accompanying choledocholithiasis rates were reported between 11% and 40% of the XGC patients [5,17,18]. Extrahepatic bile duct exploration, hepaticojejunostomy, and T-tube drainage can be performed intraoperatively for common bile duct stones. Also, preoperative biliary drainage methods are a treatment method for common bile duct stones. In the present study, 46% of the patients underwent ERCP in the preoperative and postoperative periods. Choledocholithiasis was found in 26% of patients. Of these patients, 3% underwent choledochojejunostomy. Most of the CBD stones were removed with ERCP in the preoperative period.

The limitations of the present study were being retrospective, single-centered, and having a small sample size. Finally, an experienced surgeon did not perform laparoscopic cholecystectomy, and an experienced radiologist did not report radiological examinations in all cases. Despite these limitations, we obtained similar results when we compared our study with the current literature.

Conclusion

Preoperative diagnosis and surgical management of XGC can be challenging. If a surgeon has suspicion of XGC in preoperative period, expert radiologist opinion should be asked. Morbidity rates were higher than standard cholecystectomy. If there is suspicion of malignancy, surgeons should always keep in mind to perform frozen-section examination to avoid unnecessary surgical procedures.

Conflict of interest statement

All authors declared they have no conflict of interest to state.

Funding information

No funding received to conduct this study.

Ethical approval

Ethics committee approval was obtained from Akdeniz University Institutional Ethics Committee (25.01.2024/1).

Informed consent

No informed consent was obtained from the patients since it was a retrospectively designed original study.

Author's contributions

A.A. performed conception, design, analysis, and writing manuscript; U.A. performed data collection and literature review. All authors read and approved the final version of the manuscript.

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