



Original research

Cholesterolosis in routine histopathological examination after cholecystectomy: What should a surgeon behold in the reports?

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HIGHLIGHTS

- Cholesterolosis is associated with metaplasia.
- There is no relation between age and increased gallbladder wall thickness.
- Gallbladder wall thickness is not correlated with presence of acute inflammation.
- Cholesterolosis is not correlated with acute inflammation and polypoid lesions.
- Routine histopathological examination is very important.

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ABSTRACT

Introduction: Cholecystectomy is one of the most common surgical procedures. Postoperative investigation of cholecystectomy specimen has a great value since histopathological reports may document some entities with significant clinical consequences. The aim of this study was to evaluate the association between cholesterolosis and the reports indicating some histopathological alterations in symptomatic cholecystitis. **Methods:** This paper is based on a retrospective study. Histopathological reports of 432 cholecystectomy specimens between January 2011 and June 2013 were reviewed. Three reports were excluded due to perioperative diagnosis of cancer. Reports of 429 cholecystectomy specimens of the acute and symptomatic chronic cholecystitis patients were analyzed. Standardization of the reporting was questioned. Age, gender, histopathological wall thickness of gallbladder, reporting rates of acute inflammation, cholesterolosis, polypoid lesions, epithelial hyperplasia, gastric or intestinal metaplasia, dysplasia and incidental cancer were investigated and compared between patients with and without cholesterolosis. Reported rates of histopathological findings were comparable between patients under and over 60 years old and patients with and without reported cholesterolosis. **Results:** Reported histopathological findings were presented as acute inflammation in 46 (10.7%), cholesterolosis in 79 (18.4%), gallbladder polypoid lesions in 7 (1.6%), epithelial hyperplasia in 16 (3.7%), metaplasia of any type in 34 (7.9%) of 429 patients. Dysplasia was excluded whereas one incidental gallbladder carcinoma was reported. Epithelial hyperplasia and metaplasia were found to be related to age. Gallbladder wall thickness was decreased with cholesterolosis. However, only a correlation between cholesterolosis and gender or metaplasia was noted. **Conclusion:** Recent study suggests that cholesterolosis is somehow associated with metaplasia. Thus, surgeons should carefully interpret the histopathology reports based on unusual or exceptional findings corresponding to the cholecystectomy specimens. Any abnormal finding in the reports should be investigated in terms of the progress of the pathology and also its clinical consequences.

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1. Introduction

Cholecystectomy is a common surgical procedure which is performed routinely for several diseases of gallbladder including acute or chronic cholecystitis, polypoid lesions and cancer [1–4]. Preoperative imaging is essential not only for the diagnose of clinical conditions, but also for surgical planning. Ultrasonography is used primarily to evaluate gallbladder wall thickness and or morphological alterations [5], whereas some advanced diagnostic imaging techniques are used according to the existing clinical conditions [6,7]. However, routine histopathological examinations might be needed to confirm the diagnosis and to predefinition of some incidental findings such as cancer in the presence of inadequate or limited imaging techniques [8,9].

Transabdominal ultrasonography may be help to measure gallbladder thickness since a gallbladder wall thickness >3 mm is considered as a diagnostic characteristic of acute cholecystitis. Some other clinical conditions should be considered in the differential diagnosis in the early phase of the disease [10,11]. However, incidental or rare lesions such as true gallbladder polyps and even cancer was reported as might be misdiagnosed with ultrasonography [12]. Currently, an age-based ultrasonography protocol was suggested for designation of asymptomatic cholelithiasis and >60 years old patients were evaluated less likely to have acute cholecystitis [13]. Contrast enhanced endoscopic ultrasonography has been recently presented to improve diagnostic accuracy and to state an interobserver agreement in the differential diagnosis for patients with gallbladder thickening [14].

The diagnosis of an incidental cancer or a premalignant lesion should alert the clinician for further medical investigation and surgical intervention. It has been reported that some incidental lesions of the gallbladder may be observed or recognized during histopathological evaluation of the cholecystectomy specimen [15]. A metaplasia-dysplasia and cancer sequence has been interpreted from this perspective [16,17] and routine and selective histopathological evaluation of cholecystectomy according to several risk factors, such as age, was discussed previously [18]. Thus, it should be considered that routine histopathological evaluation and a standardized documentation may help the clinician to handle such complicated conditions in time.

Selective histopathological evaluation of cholecystectomy according to several risk factors, such as age should be questioned [18]. It is obvious that a selective approach may lead to a delay in diagnosis of cancer leading physicians to face with an advanced cancer patient will be hardly managed for medical cure. In addition, surgeons will be responsible for medico-legal issues.

The aim of the present study is to evaluate the reported cholesterolosis rates and its association with histopathological gallbladder wall thickness and other reported histopathological findings.

2. Materials and methods

2.1. Ethical issues

Institutional review was not required since this is a retrospective study.

2.2. Patient's issue

Histopathology records of the patients with acute and symptomatic chronic cholecystitis who were treated with open or

laparoscopic cholecystectomy at the dates of January 2011 and June 2013 were reviewed retrospectively. 432 records were included in the study. Perioperative diagnosis of gallbladder cancer was suspicious for three patients. These were confirmed to have adenocarcinoma and were excluded from the analysis. Age and gender were recorded for demographic analysis. The documentation concerning the preoperative ultrasonography performed routinely before cholecystectomy was not evaluated in the present study due to the lack of data standardization.

Reports concerning to the results of the routine histopathological examination following cholecystectomy with macroscopic morphometric measurements on three independent specimen samplings were evaluated using a standardized form including the headings of “age, gender, specimen site, specimen extraction method, basic clinical information, macroscopic findings and histopathological diagnosis”. However, histopathological reports did not include standardized information under the headings of basic clinical information, macroscopic findings and histopathological diagnosis. ICD codes were not included in the reports. Microscopic findings were not standardized, and relatively detailed reports of the patients diagnosed with cancer preoperatively were compared with the others. Thus, only gallbladder wall thickness and morphological parameters of cholecystectomy specimens were taken into consideration in this study since the other parameters were not reliable to be used as a data.

2.3. Study design

Two groups were included in the study: control group was comprised of the patients without cholesterolosis whereas study group consisted of those with cholesterolosis. Control and study groups were compared according to age, gender and histopathological parameters.

2.4. Histopathological parameters

Histopathological parameters included gallbladder wall thickness, reporting rates of cholesterolosis, polypoid lesions, acute inflammation, epithelial hyperplasia, gastric or intestinal metaplasia, dysplasia, and incidental cancer.

2.5. Statistical analysis

Case processing summary, age, gender, frequency and descriptive analysis were performed using SPSS version 13.0 (SPSS Inc, USA). Differences between study parameters such as age, gender, histopathological parameters, gallbladder wall thickness and other findings were analyzed using Chi-Square test. Mann–Whitney *U* test was used to compare the patients with and without cholesterolosis. Correlations between cholesterolosis and age, gender or other study parameters were tested with Pearson correlation test. Student *t* test was used to compare the patients ≤60 years and >60 years old age or with and without cholesterolosis for gallbladder wall thickness. Linear logistic regression analysis was used to evaluate the relation between age and gallbladder wall thickness. A power analysis was not performed. *p* < 0.05 was considered as statistically significant.

3. Results

Basic features and data obtained from 429 patients with acute or symptomatic cholecystitis in the case series are presented in Table 1. One patient with a right abdominal pain was diagnosed with incidental gallbladder carcinoma (signet cell carcinoma)

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