

Original article:

24. Gallbladder Mucosal Changes Occurring in Gall Stone Patients: An Observational Study

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Abstract

Background: Gallstone disease is a worldwide medical problem, but the incidence rates show substantial geographical variation. The gallbladder mucus plays a regulatory role in cholelithiasis as it promotes the nucleation of stones. Mucus, calcium and lipids act in concert to form the gallstones.

Under the light of above evidence; we planned the present study to correlate various gallstone characteristics with the type of mucosal response in gall bladder.

Materials & methods: The present study included evaluation of mucosal changes in gall bladder. We conducted histopathological examination of 50 gall stone patients who underwent cholecystectomy. Following morphological character types of the gall stones were considered: cholesterol, Pigment, Mixed and Combined type. All the results were recorded on excel sheet and were evaluated by SPSS software.

Results: In the present study, we included a total of 50 patients who underwent laparoscopic cholecystectomy. Majority of the patients belonged to the age group of 40 to 50 years. We didn't observe any significant difference while correlation the mucosal response with type of gall stones.

Conclusion: We couldn't locate a cause and effect relationship between the gall stone and mucosa. However; future studies are directed for better results.

Key words: Gallbladder, Gallstones, Mucosal

Introduction

Gallbladder is an accessory organ of the digestive tract, storing and concentrating bile between meals. In response to feeding, the gallbladder contracts and releases bile into the small intestine. Gallstone disease is a worldwide medical problem, but the incidence rates show substantial geographical variation, with the lowest rates reported in African populations.¹⁻³

Since most gallstones are asymptomatic, it is essential to define exactly which symptoms are caused by gallstones: true biliary pain and/or complications, versus nonspecific abdominal complaints including dyspepsia. Gallstone-associated pain seems to follow a certain pattern in

most patients. Gallstone disease produces diverse histopathological changes in gallbladder mucosa—namely, acute inflammation, chronic inflammation, granulomatous inflammation, hyperplasia, cholesterosis, dysplasia and carcinoma.^{4, 5} The gallbladder mucus plays a regulatory role in cholelithiasis as it promotes the nucleation of stones. Mucus, calcium and lipids act in concert to form the gallstones.⁶⁻⁸

Under the light of above evidence; we planned the present study to correlate various gallstone characteristics with the type of mucosal response in gall bladder.

Materials & methods

The present study was planned in the department of general surgery and general pathology of RBM Hospital, Bharatpur, Rajasthan, and included evaluation of mucosal changes in gall bladder. Ethical clearance was taken from the ethical committee of the institution and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 patients were included in the present study. We conducted histopathological examination of 50 gall stone patients who underwent cholecystectomy. Dimensions, outer surface, wall thickness and mucosa type were noted on gross examination of gallbladder. The gall stones were assessed for following various parameters:

- Number,
- Size and
- Morphologic type.

Histopathologic examination of the specimen was done. 3 to 4 micrometre thick sections were cut of the processed tissue specimen and were stained with routine hematoxylin and eosin staining. Following morphological character tic types of the gall stones were considered as described previously in the literature:⁹

- Cholesterol
- Pigment
- Mixed
- Combined

All the results were recorded on excel sheet and were evaluated by SPSS software. Chi- square test was used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

Results

In the present study, we included a total of 50 patients who underwent laparoscopic cholecystectomy.

Majority of the patients belonged to the age group of 40 to 50 years. 16 percent of the patients were

less than 30 years of age. Mixed type of gall stones were encountered in majority of the cases (50 percent). Cholesterol type of gall stones were encountered in 10 percent of the cases. Cholecystitis was the most common mucosal response encountered followed by Cholecystitis with metaplasia. We didn't observe any significant difference while correlation the mucosal repose with type of gall stones.

Discussion

In the present study, we didn't observe any significant difference while correlation the mucosal repose with type of gall stones. Wrenn SM et al (2017) reviewed the pathology results from gallbladder specimens sent for routine pathology, determine the incidence of iGBC in our population, and determine whether surgeons need to send specimens for further analysis if no preoperative or intraoperative suspicion for malignancy is present. They performed a large single-center case-controlled retrospective study of all gallbladder specimens sent for routine histopathological analysis between 2009 and 2014. The results were tabulated, including both common and rare findings. We then analyzed patient outcomes and survival for the case group of iGBC patients and determined value in life years (LY) gained per dollar spent on pathological screening. A total of 2153 pathology reports were reviewed. After exclusion criteria, a total of 1984 were included in data analysis. The incidence of iGBC was 0.25 % (95 % CI 0.08, 0.59), and dysplasia was 0.70 % (0.39, 1.20). The most common pathological findings included chronic cholecystitis in 89 % (87.4, 90.3) and cholelithiasis in 81 % (79.1, 82.6) of specimens. Total charges for pathological screening were \$65,404 per LY to date; however, two patients have ongoing disease-free survival and this figure is expected to decrease. The incidence of significant pathology necessitating change in

clinical management is extremely low in our population. Despite this, the cost per LY gained from routine pathological analysis appears to be of sufficient value to continue with current practice.¹⁰ Pillai V et al analysed the histopathological changes in gallstone disease and to study the clinical and biochemical factors that are seen in gall stone disease. 108 patients admitted with diagnosis of cholelithiasis and posted for cholecystectomy were studied. 63% of the patients were females with a female to male ratio of 1.7:1. Of the group, 64.8% had a BMI between 25 and 29.9. 65.7% patients got operated within one year of the onset of symptoms. Serum cholesterol levels were found elevated in majority of patients. 61% patients had multiple gall stones. 62% had stones composed of cholesterol, bilirubin, calcium carbonate and calcium oxalate. 102 out of the 108 specimens showed histological features of chronic cholecystitis only. One case showed a premalignant change in the form of pyloric metaplasia. Cholelithiasis is seen mostly in females, most of them having elevated cholesterol levels. The commonest histopathological change associated with cholelithiasis is chronic cholecystitis. Premalignant lesions are seen only in a small minority only. Hence early elective cholecystectomy can prevent malignant transformation in asymptomatic gall stones.¹¹ Dattal S et al correlated the various histological

changes in the gallbladder with the different types of gallstones (cholesterol, pigmented and mixed). The age, sex distribution and the incidence of different types of gallstones was studied. The histological changes in the gallbladders were examined and its correlation with the type of gallstones was evaluated. In all 1371 specimens of gall bladder were received during this period. The mean age of the patients was 44 years (age range 13-86 years) with Male: Female ratio of 1: 8.3. Out of the total 1371 cholecystectomy specimens, 1259 (91.8 %) had calculi and 112 (8.2%) were acalculus. Of the 1259 cases of calculus disease, mixed stones were observed in 840 (66.7%) patients, cholesterol stones in 289 (22.9%) and pigmented stones in 130 (10.4%) patients. Overall 1291 (94%) cases had chronic cholecystitis followed by acute cholecystitis and chronic active cholecystitis in 2% each, dysplasia in 1.5% and carcinoma cases 0.5%. Routine cholecystectomy performed for a common condition like gallstone disease can result in detection of diverse and wide spectrum of histopathological lesions ranging from chronic cholecystitis to carcinoma.¹²

Conclusion

Under the light of above results, the authors couldn't locate a cause and effect relationship between the gall stone and mucosa. However; future studies are directed for better results.

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Table 1: Distribution of subjects according to age group

Age group	Frequency	Percent
<30	8	16
30-39	10	20
40-49	15	30
50-59	10	20
>60	7	14
Total	50	50

Table 2: Distribution of subjects according to type of stone

Type	Frequency	Percent
Mixed	25	50
Combined	14	28
Cholesterol	5	10
Pigment	6	12
Total	50	100

Table 3: Association of mucosal response with gallstone type

Diagnosis	Gallstone type				Total	Chi-squar e value	P- value
	Mixed	Combined	Cholester ol	Pigmented			
Cholecystitis	25	11	2	2	40	3.54	0.55
Hyperplasia	1	1	0	1	3		
Cholecystitis with metaplasia	3	2		1	6		
Carcinoma	1	0	0	0	1		
Total	30	14	2	4	50		