

## Assessment of Epithelial Changes of Gall Bladder in the Gallstone Disease

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### Abstract

**Background:** Background: Gallstone disease is a common health problem worldwide forming about 95% of the biliary tract disorders. The estimated prevalence of gallstone disease in India has been reported between 2- 29%. In India, this disease is seven times more common in north (stone belt) than is south India. It is appeared to be increasing in incidence over past couple of decades in India.

**Material & Methods:** This prospective study was conducted in the Departments of Anatomy and Pathology of R.N.T. Medical College and Attached Hospital (M.B. Govt. Hospital), Udaipur. The study was done in hundred patients of cholelithiasis which were admitted and operated in our hospital either open or laparoscopically, irrespective of age, sex, physique or parity.

**Results:** In the present study it was observed that maximum (46%) cases had mixed type gallstones. (30%) cases had pigmented type gallstones and (24%) cases had pure cholesterol type gallstones. In the present study it was observed that multiple gallstones present in 58% cases which is followed by single gallstones present in 30% cases. In the present study it was observed that maximum 32% cases had faceted gallstones which is followed by irregular gallstones present in 29% cases which is followed by round gallstones present in 22% cases. Ovoid gallstones present in 15% cases. Only 5% cases had normal mucosa. Rest of cases showed different types of epithelial alterations as above mentioned. The most common epithelial alterations observed was focally ulcerated which is followed by hyperplastic changes. Atrophic changes were observed in 9% cases. However, this difference was statistically non- significant.

**Conclusion:** The type and number of gallstones were not significantly correlated with the various epithelial lesions of gallbladder. Histopathological examination is thus important in every case of cholecystectomy for identifying hyperplasia, metaplasia, dysplasia and carcinoma.

**Keywords:** Gallstones, Epithelial lesions, Histopathological examination.

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## Introduction

The gallbladder is a pear-shaped saccular organ that lies in a shallow fossa on the visceral surface of the right hepatic lobe. In the adult, on average, it is 10 cm in length, 3-4 cm in width and has a mural thickness of 1-2 mm. Its capacity is usually 40 to 70 ml but may increase up to 100 ml. Traditionally, it has been divided into three parts: fundus, body and neck. The gallbladder is not always found in the underside of liver[1]. Occasionally, it may be suspended from the liver by a mesentery or completely buried in substance of the liver. Those embedded in the liver, intrahepatic gallbladders are prone to calculi. Histologically, the gallbladder wall has four defined layers, a mucosa composed of columnar epithelium and underlying lamina propria, a smooth muscle cell layer (muscularis), perimuscular subserosal connective tissue (also referred to as subserosa or adventitia) and serosa which does not extend between the gallbladder and the liver interface (present only on the free surface of the gallbladder)[2].

Gallstone disease is a common health problem worldwide forming about 95% of the biliary tract disorders. The estimated prevalence of gallstone disease in India has been reported between 2- 29%. In India, this disease is seven times more common in north (stone belt) than in south India. It appears to be increasing in incidence over the past couple of decades in India and the western world due to increased intake of fatty and high-calorie diet and increased consumption of alcohol[3]. Cholelithiasis are very common particularly in fatty, fertile and female of forty to fifty. Various signs and symptoms like severe pain in Murphy's point in the right upper quadrant of the abdomen, bilious vomiting, mild to moderate increase in temperature, obstructive jaundice, loss of appetite and weight are present in these diseases[4]. It is commonly believed that bile stasis is the prime factor for gallstone formation. A major causative agent for bile

stasis is gallbladder dyskinesia which is there may be a consequence of gallbladder wall pathology[5]. Cholelithiasis produces diverse histopathological changes in the gallbladder mucosa namely acute inflammation, chronic inflammation, glandular hyperplasia, granulomatous inflammation, cholesterosis, dysplasia and carcinoma[6]. Hence, the present study was conducted to assess the epithelial changes of the gallbladder in the gallstone disease.

## Materials & methods

This prospective study was conducted in the Departments of Anatomy and Pathology of R.N.T. Medical College and Attached Hospital (M.B. Govt. Hospital), Udaipur. The study was done in hundred patients of cholelithiasis which were admitted and operated in our hospital either open or laparoscopically, irrespective of age, sex, physique or parity. In all cases a detailed clinical history was undertaken and recorded on a predesigned Proforma. The patients were selected for study by simple random sampling. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent for the procedure was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time.

After cholecystectomy, details of the gallbladder were noted which included presence of adhesions, gallbladder wall thickness, condition of the gallbladder whether contracted or distended with presence of gallstones, single, double or multiple and round, irregular or faceted and pigmented or cholesterol type. The surgically resected gallbladder specimens were fixed in 10% formalin solution and embedded in paraffin. For the cases without any gross abnormality, standard 3 sections including fundus, body and neck were taken. Haematoxylin & eosin stain were used for routine histochemistry. All the data was

recorded on Microsoft excel spread sheet and data analysis was done at 10% alpha and 90% confidence interval using SPSS v22 software. Test of significance were applied on collected and organized data and p value less than 0.05 was considered as statistically significant association between study variables.

## Results

The study included patients of cholelithiasis which were admitted and

operated in our hospital either open or laparoscopically, irrespective of age, sex, physique or parity. In the present study it was observed that 74% cases of Cholelithiasis were female. The female to male ratio is 3:1. The mean age of study participants was  $42.9 \pm 5.8$  years. The maximum number of cases of cholelithiasis (33%) was seen in 4th decades of life, followed by 25% in 5th decade of life.

**Table 1: Cases of Cholelithiasis: Distribution According to Sex**

Sex	Number of Patients (Cholelithiasis)	Percentage
Male	26	26%
Female	74	74%
<b>Total</b>	<b>100</b>	<b>100%</b>

In the present study it was observed that maximum (46%) cases had mixed type gallstones. (30%) cases had pigmented type gallstones and (24%) cases had pure cholesterol type gallstones. In the present study it was observed that multiple gallstones present in 58% cases which is followed by single gallstones present in

30% cases. In the present study it was observed that maximum 32% cases had faceted gallstones which is followed by irregular gallstones present in 29% cases which is followed by round gallstones present in 22% cases. Ovoid gallstones present in 15% cases.

**Table 2: Cases of Cholelithiasis: Distribution According to Type of Gallstones**

Type of Gall Stones	Number of Patients (Cholelithiasis)	Percentage
Pure cholesterol	24	24%
Pigmented	30	30%
Mixed	46	46%
Total	100	100%

**Table 3: Distribution of Type of Gallstone According to Changes in Epithelium**

Epithelium	Type of Gall Stone			Total No. of cases
	Cholesterol	Mixed	Pigmented	
Normal	1	3	1	5
	20.0%	60.0%	20.0%	100.0%
Focally Ulcerated	5	7	7	19
	26.3%	36.8%	36.8%	100.0%
Diffuse Ulcerated	4	8	1	13
	30.8%	61.5%	7.7%	100.0%
Atrophic	4	2	3	9
	44.4%	22.2%	33.3%	100.0%
Hyperplastic	1	8	5	14
	7.1%	57.1%	35.7%	100.0%

Hyperplastic And Metaplastic	0	3	2	5
	0.0%	60.0%	40.0%	100.0%
Atrophic & Mild Hyperplastic	0	0	1	1
	0.0%	0.0%	100.0%	100.0%
Focally Ulcerated & Mild Hyperplastic	4	5	4	13
	30.8%	38.5%	30.8%	100.0%
Focally Ulcerated & Atrophic	4	3	2	9
	44.4%	33.3%	22.2%	100.0%
Focally Ulcerated & Metaplastic	1	5	3	9
	11.1%	55.6%	33.3%	100.0%
Diffuse Ulcerated & Metaplastic	0	2	1	3
	0.0%	66.7%	33.3%	100.0%

Chi Sq = 17.312 p value = 0.633 (NS)

The table 3 shows that out of 100% cases of cholelithiasis, only 5% cases had normal mucosa. Rest of cases showed different types of epithelial alterations as above mentioned. The most common epithelial alterations observed was focally ulcerated which is followed by hyperplastic changes. Atrophic changes were observed in 9% cases. However, this difference was statistically non-significant.

### Discussion

Cholelithiasis is a common disorder afflicting 10% to 20% of adult population in developing countries. Gallstones are a major cause of morbidity and mortality throughout the world. Gallstones remain asymptomatic for many years before appearance of symptoms. Gallbladder with gallstones frequently showed chronic cholecystitis[5]. The chronic cholecystitis presents a large range of associated lesions such as cholesterolosis, muscle hypertrophy, parietal fibrosis, adenomatous proliferation of mucous glands, hyperplasia, metaplasia and dysplasia, the last three lesions being unanimously recognized as precursor lesions with cancerous potential[6].

The study included patients of cholelithiasis which were admitted and operated in our hospital either open or laparoscopically, irrespective of age, sex,

physique or parity. In the present study it was observed that 74% cases of Cholelithiasis were female. The female to male ratio is 3:1. The mean age of study participants was  $42.9 \pm 5.8$  years. The maximum number of cases of cholelithiasis (33%) was seen in 4th decades of life, followed by 25% in 5th decade of life.

In present study most of the patients of cholelithiasis were from 4th to 5th decade of life, the youngest being 12 years old male and the oldest 86 years old female. In our study, male and female ratio was 1:3. In present study, mean age was 42.9 years which is close to the findings of Khanna R. et al, 2006[7] & Aslam M.H. et al, 2013[8] but differ from the findings of Terada Tadashi et al, 2013[9].

In present study, gallstones were identified as cholesterol in 24 (24%) cases, pigmented in 30 (30%) cases and mixed in 46 (46%) cases. The mixed types of gallstones were found maximum (46%) cases and minimum cholesterol type (24%) cases during present study. These findings are in accordance with the findings of Weerakoon H. et al, 2014[10] and Mathur S.K. et al, 2012 [11]. But our observations are not consistent with the results of Tadashi T. et al, 2013[9] who observed maximally pigmented gallstone (47%)

cases and number of cholesterol gallstones cases (44.9%) respectively.

In present study, out of 100% cases of cholelithiasis, only 5% cases had normal mucosa. Rest of cases showed different types of epithelial alterations as above mentioned. The most common epithelial alterations observed was focally ulcerated which is followed by hyperplastic changes. Atrophic changes were observed in 9% cases. However, this difference was statistically non-significant. Cholelithiasis produces a series of epithelial pathological changes which could be precursor lesions of gallbladder cancer. These changes include hyperplasia, metaplasia (pyloric & intestinal) & dysplasia. Our results are comparable to those reported by Seretis C. et al, 2014 with almost similar distribution of various epithelial lesions[12].

### Conclusion

We concluded from the present study that overall mean age was 42.9 years. Most of the patients of cholelithiasis were from 4th to 5th decade of life. Age, sex, weight, dietary habits were not significantly correlated with type of gallstones. The type and number of gallstones were not significantly correlated with the various epithelial lesions of gallbladder. Histopathological examination is thus important in every case of cholecystectomy for identifying hyperplasia, metaplasia, dysplasia and carcinoma.

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