



<b>Title</b>	<b>Gallbladder resections: Demographic characteristics and surgical pathology in Hong Kong revisited</b>
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# Gallbladder Resections: Demographic Characteristics And Surgical Pathology In Hong Kong Revisited

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## Summary

**Objective:** To study the demographic characteristics and surgical pathology of diseased gallbladders in Hong Kong. **Design:** Retrospective review of pathology records. **Subjects:** Surgically resected gallbladders submitted to the Department of Pathology of The University of Hong Kong at the Queen Mary Hospital from 1993 to 1996. Excluded were cases of essentially normal gallbladder resected for reasons other than diseases of the gallbladder. **Results:** A total of 1,865 cases of cholecystectomies were selected. The mean age at cholecystectomy was 56.6 years (SD=15.5 years). Female outnumbered male patients in a ratio of 1.38:1. Age specific cholecystectomy rates among females were higher than those of the males in nearly all age groups. A steady rise in the age specific rates of cholecystectomy with age was observed. Patients in their sixties formed the largest group by age in decade and accounted for 24.2% of all cases. The estimated annual rate of cholecystectomy per 100,000 population in the 60 to 69-year age group was 247. Inflammatory diseases of the gallbladder accounted for 93.7% of all resections. There were 18 cases of primary carcinoma of the gallbladder. The estimated age standardized rate of primary cancers of gallbladder was 2.1 per 100,000 population. Adenoma, mucocele, infarction, schistosomiasis, and clonorchiasis were occasionally diagnosed on examination of the gallbladders. **Conclusion:** Cholecystectomies were most commonly performed for inflammatory gallbladder diseases. Females in almost every age group had a higher rate of gallbladder resections than males. Our earlier finding of a steady increase in cholecystectomy rate with advancing age was supported by the more recent data. The age specific cholecystectomy rates in the two studies were comparable. (HK Pract 1997; 19: 237-244)

**Keywords:** Gallbladder pathology, Hong Kong, gallbladder carcinoma

## 摘要

目的：探討香港膽囊疾病的人口統計學和外科病理學特點。  
設計：病理報告的回顧性研究。  
對象：1993至1996年間，瑪麗醫院香港大學病理系收到的，除因其他疾病摘除的正常膽囊外的所有膽囊。  
結果：共計有1865名膽囊切除病人，平均手術年齡為56.6歲，(統計偏差=15.5年)，各年齡段中，女性均多於男性，比例為1.38:1。而且手術率隨年紀增大而穩步升高，60歲組佔總數24.2%居首位，60至69歲人口中每年膽囊切除率為247/10萬。病理學結果顯示：93.7%切除的膽囊屬於炎症病變。有18例為原發性膽囊癌，其發病率約每年2.1/10萬。此外，還發現膽囊腺瘤，黏液腫，梗塞，血吸蟲病及肝吸蟲病。  
結論：膽囊切除的最常見原因是膽囊炎症。各年齡組女性手術率均高於男性。手術率隨年紀增加而增加，近期另一研究結果亦證實這一結論。  
主要詞彙：膽囊病理學、香港、膽囊癌。

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## Introduction

Until recently, the surgical pathology and demographic characteristics of gallbladder diseases have attracted little local research interests. The authors in 1991 conducted a retrospective study on this topic by analyzing 2,163 cholecystectomies performed in a 5-year period.<sup>1</sup> Recently our interest on this subject was recrudesced by a similar study carried out by Chung and Wu<sup>2</sup> in another hospital in Hong Kong. Interesting points for discussion were raised and further researches were called for. In this communication, we are to present new data collected since our last study<sup>1</sup> and have them compared with our earlier set of data and those of Chung and Wu.<sup>2</sup>

## Materials and methods

The materials were taken from the surgical and biopsy file of the Department of Pathology of The University of Hong Kong at the Queen Mary Hospital Compound. The pathology reports and clinical data as given on the surgical and biopsy pathology request forms since 1993 were fully computerized by using a proprietary program which obsoleted a microcomputer index of the pathology records developed in mid-1986.<sup>3</sup> The computerized data were searched for gallbladders resected during 1993 to 1996. Throughout these years the Department received surgically resected gallbladder from both the Queen Mary and Tung Wah Hospitals for routine histopathologic examination. The surgical

department in the Tung Wah Hospital worked closely with that of the Queen Mary Hospital and took over cases referred to the University Department of Surgery at the Queen Mary Hospital for surgical management. Pertinent pathology records were collected into a new database to facilitate later analysis. Since the focus of this study was on diseased gallbladders which had undergone surgical resections, cases of essentially normal gallbladders removed during another primary surgical procedure (e.g. choledochal cyst excision, hepatectomy, liver transplantation, Whipple's operation, etc.) were excluded. The microscopic slides were reviewed in selected cases.

Gallbladder diseases were classified into 6 mutually exclusive groups in the order specified below for the purpose of this study. The classification was essentially the same as the one used in our previous study.<sup>1</sup> The main difference was the exclusion of secondary malignancies from the present study and thus their exclusion from Group 2.

### Group 1

Benign tumours and tumour like lesions. Included under this group were polyps and adenomas. When there was coexisting in-situ or invasive carcinoma, the case was put into the next group.

### Group 2

Malignant tumours. This group included all cases of in-situ

carcinoma and primary cancers, regardless whether these gallbladders had other lesions or not.

### Group 3

Acute cholecystitis. Cases included acute, subacute, acute on chronic, and eosinophilic cholecystitis, empyema of gallbladder, haemorrhagic, gangrenous or suppurative inflammation, and perforation.

### Group 4

Chronic cholecystitis. The group included the following diagnoses: chronic cholecystitis, follicular cholecystitis, xanthogranulomatous inflammation, cholelithiasis, fibrosis, atrophy, mucocele, and villous or adenomyomatous hyperplasia.

### Group 5

Normal and minor lesions. This group included morphologically normal gallbladders and those showing autolysis and cholesterosis.

### Group 6

Miscellaneous. This included the remaining cases.

The gender and age specific rates of diseases of the gallbladder, in number per 100,000 population per year, was calculated based on the estimated population of Hong Kong by sex and age group at mid-1994.<sup>4</sup> We took that the Queen

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Mary and Tung Wah Hospitals together were attended by one-tenth of the population of Hong Kong.

### Results

Altogether 1,865 resected gallbladders were received in the 4-year period. Of all the cholecystectomies, 785 (42.1%) and 1,080 (57.9%) were performed on male and female patients respectively. The male to female ratio was 1:1.38. The mean age of all patients was 56.6 years (SD=15.5 years). The mean age of the male patients was 56.4 years (SD=14.8 years) and that of the female patients was 56.7 years (SD=16.7 years). The difference between the two means was very small and not significant. The gender specific age distribution of the patients is shown in **Table 1**. The youngest patient

was a boy 6 years old who had stones in the gallbladder and common bile duct. Pigment stones were found in the gallbladder resected from a 7-year-old boy who suffered from congenital spherocytosis.

**Figure 1** shows the rates of cholecystectomy per 100,000 population per year calculated by sex and age group. The corresponding rates of the 1991 study<sup>1</sup> was also shown for comparison.

The number and percentage of cholecystectomies showing various groups of lesions classified according to our method is shown in **Table 2**. The mean age at which cholecystectomies were performed for each group is also tabulated.

The 41 gallbladders in Group 1 included 29 cholesterol polyps, 8

adenomas, 3 inflammatory polyps, and 1 papillary cystadenoma. Of the 29 cholesterol polyps, 15 were found in male and 14 in female patients. The mean age at cholecystectomy was 44.7 years (SD=14.0 years) for patients who got cholesterol polyps. Two of the adenomas and the papillary cystadenoma showed significant epithelial dysplasia short of in-situ carcinoma.

The group 2 malignant tumours numbered 18 in total. All cases were primary adenocarcinoma of the gallbladder. One of them developed in an adenoma. Female cases predominated with 12 carcinomas found in women. The age standardized rate of primary carcinoma of gallbladder in Hong Kong in the study period was 2.1 per 100,000 population per year according to our calculation. The mean age of this group of patients was 72.4 years which was the highest among all groups. Only 3 of the patients were aged less than 60 and were 44, 53, and 59 years old respectively.

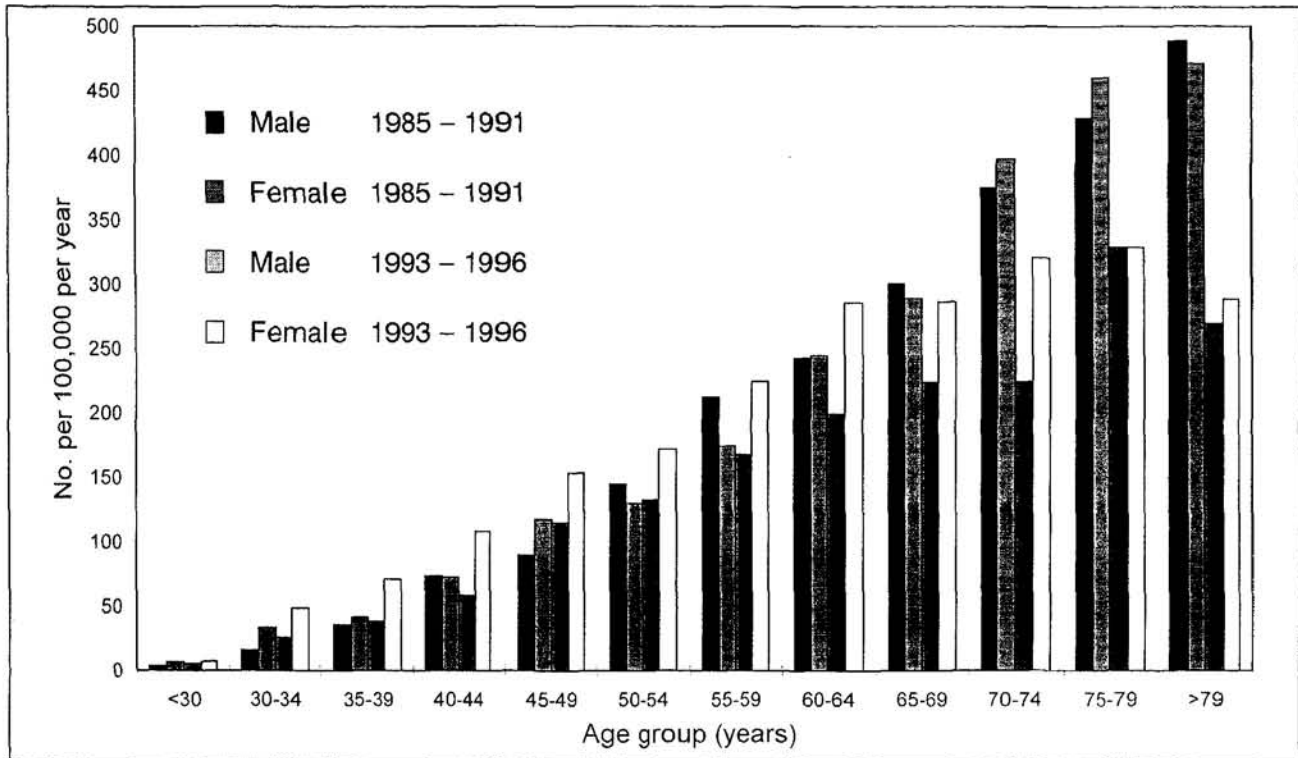
The inflammatory lesions of gallbladder comprised Groups 3 and 4. A few uncommon lesions were encountered with chronic inflammatory changes in the gallbladders. There were 7 mucocoeles. One gallbladder was described as porcelain. There was a case of tuberculous peritonitis with caseating granulomas in the gallbladder. One gallbladder contained schistosomal ova. Clonorchiasis was a finding additional to inflammation in 2 gallbladders.

**Table 1: The number and percentage of cholecystectomies by age and gender performed in 4 years (1993 to 1996)**

Age group	Male (%)	Female (%)	Total (%)
0-9	2 (0.2)	0 (0.0)	2 (0.1)
10-19	0 (0.0)	2 (0.2)	2 (0.1)
20-29	27 (3.4)	35 (3.3)	62 (3.3)
30-39	83 (10.6)	151 (14.0)	234 (12.6)
40-49	152 (19.4)	202 (18.7)	354 (19.0)
50-59	165 (21.0)	177 (16.4)	342 (18.3)
60-69	197 (25.1)	254 (23.5)	451 (24.2)
70-79	123 (15.7)	184 (17.0)	307 (16.5)
80-89	36 (4.6)	65 (6.0)	101 (5.4)
90 and over	0 (0.0)	10 (0.9)	10 (0.5)
<b>Total</b>	<b>785 (100)</b>	<b>1,080 (100)</b>	<b>1,865 (100)</b>

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Figure 1: The rates of cholecystectomy per 100,000 population per year calculated according to sex and age



The number of gallbladders showing normal and minor lesions under Group 5 was 55. The reasons for resection in these cases were not known to us. It was possible that many of these gallbladder were resected for biliary or gall stone diseases. Cases of essentially normal gallbladders resected during surgical procedures primarily performed for recurrent pyogenic cholangitis, liver transplantation, and tumours of the liver, pancreas, common bile duct, and Ampulla of Vater were excluded for the purpose of this study.

The last group, miscellaneous, included 3 cases. There was one case of torsion of the gallbladder leading to infarct. Another case of infarction was caused by thrombosis of the arterial vessels complicating

gastrectomy. A gallbladder in a young woman was resected following a gun shot injury to her abdomen.

### Discussion

Our previous study<sup>1</sup> was based on data collected on 2,163 cholecystectomies in a 5-year period from mid-1986 to mid-1991. Its salient findings relevant to the present study are summarised below in 7 points.

- (1) The yearly average number of cholecystectomies was 433.
- (2) Inflammatory diseases of the gallbladder accounted for about 92% of all the resections.
- (3) There was no significant increase in the number of

primary cancers of the gallbladder based on data collected over a 20-year period.

- (4) The mean age of patients at cholecystectomy was 60.4 years (SD=15.4 years).
- (5) The age-specific rates of cholecystectomy of the male and female patients were similar in all age groups.
- (6) A steady rise in the age-specific rates of cholecystectomy with age was observed.
- (7) Patients in their sixties formed the largest group by age in decade and accounted for 25.5% of all cases. The estimated annual rate of cholecystectomy per 100,000 population in this age group was 266.

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**Table 2: Surgical pathology of 1,865 resected gallbladders**

Group	Male (%)	Female (%)	Total (%)	Mean Age (SD)
1. Benign tumours	21 (2.7)	20 (1.8)	41 (2.2)	50.5 (16.7)
2. Malignant tumours	6 (0.8)	12 (1.1)	18 (1.0)	72.4 (10.1)
3. Acute cholecystitis	187 (23.8)	216 (20.0)	403 (21.6)	62.2 (15.9)
4. Chronic cholecystitis	534 (69.0)	811 (75.1)	1,345 (72.1)	55.9 (28.1)
5. Normal and minor changes	36 (4.6)	19 (1.8)	55 (2.9)	47.4 (13.0)
6. Miscellaneous	1 (0.1)	2 (0.2)	3 (0.2)	56.7 (24.7)
Total	785 (100)	1,080 (100)	1,865 (100)	

The following is a comparison between the results of the two studies. The first point to note was a slight increase in the yearly average number of cholecystectomy specimens from 433 of the 1991 study<sup>1</sup> to 466 of the present study. This was an unexpected finding because of 2 reasons. Firstly, new regional hospitals on the Hong Kong Island began operation during the past 5 years. Thus the patient load of the Queen Mary and Tung Wah Hospital cluster on the western side of the Island should decrease. Secondly, some cholecystectomies were being excluded from the present study whereas the 1991 study<sup>1</sup> had included all cholecystectomies of that period. Based on data collected in the 1991 study, the new selection criteria would reduce the number of cases studied by about 3%. The slight increase in the average number of cholecystectomy specimens submitted to the department in the past four years was probably due to

an increasing population, since the population adjusted rates of cholecystectomy showed no increase from the 1991 study<sup>1</sup> to the present study (**Figure 1**).

The second point to note was the proportion of inflammatory diseases of the gallbladder. The figures of the two studies were comparable.

The third point was on cancers of the gallbladder. According to published cancer statistics,<sup>5,6</sup> the age standardized incidence rate of cancers of the gallbladder and extrahepatic biliary tract (ICD 9th edition, code 156) in Hong Kong was 3.2 and 3.0 per 100,000 population for 1991 and 1992 respectively. The average age standardized rate of cancers of gallbladder based on our calculation was 2.1 per 100,000 population per year in the 4-year period. These figures were comparable.

The mean age of patients undergoing cholecystectomy in the period under study was 56.6 years. This was considerably lower than that of the 1991 study.<sup>1</sup> The difference was also echoed by a drop in the percentage of patients above the age of 50 from 75.6% to 64.9% across the 2 study periods. The lowering of the mean age at cholecystectomy was largely due to a change in the age distribution of the population. Hong Kong census statistics<sup>4,5</sup> over the past 11 years showed a proportionally much greater increase of the population in the 30-39 and 40-49 age groups than those in the older age groups. **Figure 1** also shows a drop in cholecystectomy rates in the elderly subjects. The latter played a less significant role in lowering the mean age because there were much fewer elderly patients than patients of the middle age.

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## Key messages

1. Cholecystectomies were performed for inflammatory gallbladder diseases in about 94% of cases.
2. Mean age at cholecystectomy for gallbladder diseases was 57 years.
3. Females in almost every age group had a higher rate of gallbladder resections than males. The female to male ratio was 1.4 to 1 overall.
4. The cholecystectomy rate steadily increased with advancing age.
5. The number of cholecystectomies was a function of the population structure.

In the 1991 study,<sup>1</sup> little difference was observed in cholecystectomy rates between males and females. The present study showed higher rates in females in nearly all age groups. This finding was different from that of our 1991 study but was similar to the experience of Chung and Wu.<sup>2</sup> The differences in rates between male and female patients were less pronounced in our present study than those reported by Chung and Wu.<sup>2</sup> The cumulative data showed that females definitely had a higher cholecystectomy rate for gallbladder diseases than males.

Results of the 1991 study<sup>1</sup> showed a steady rise in the age specific cholecystectomy rates as age advanced. The present study showed a similar trend in cholecystectomy rates until the group aged over 79 years was reached (**Figure 1**). The elderly age groups in the present study showed

lower cholecystectomy rates than those of the 1991 study.<sup>1</sup> The reasons for this difference were unknown.

Patients in their sixties continued to form the largest group by age in decade in the present study and they made up 24.2% of all cases. The corresponding value in the 1991 study<sup>1</sup> was 25.5%. **Figure 1** shows that the cholecystectomy rates of the two studies were comparable in age groups below 70 years. The estimated cholecystectomy rate in the present study for the 60-69 age group was 247 per 100,000 per year.

The spectrum of the less common pathological lesions of the gallbladder encountered in the present study was similar to that of our earlier studies.<sup>1,7</sup> Apart from polyps, adenomas, carcinomas, and mucocèles, each series contained

occasional examples of infarction, schistosomiasis, and clonorchiasis.

In the present study, no attempt was made to determine the prevalence of gall stones. Cholecystectomy specimens, before being sent to the pathologists, were often opened and with their stones removed by the surgeons. It followed that retrospective studies based on pathology reports would greatly underestimate the incidence of gall stones. Our 1991 study<sup>1</sup> showed that stones were either found with the cholecystectomy specimens or described in the clinical history in 64.3% of inflammatory diseases of the gallbladder (Groups 3 and 4). Chung and Wu,<sup>2</sup> on the other hand, relied on operation records to provide data on gall stones. They found gall stones present in 658 (94.4%) of a total of 697 diseased gallbladders. They found that 14 out of 20 cases of carcinoma of the gallbladder were

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associated with gall stones. Daly *et al.*<sup>8</sup> in Hong Kong noted 13 of the 18 cases of gallbladder carcinoma studied by them had associated gall stones. These findings suggested that the corresponding figures (9 out of 43) reported in our previous study<sup>1</sup> in 1991 had grossly underestimated the prevalence of lithiasis. To avoid drawing inaccurate and sometimes misleading conclusions from suboptimal ascertainment of stones, data on gall stones were therefore not collected in the present study. ■

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3. Shared Care In Diabetes Mellitus (Part II): What Are The Obstacles ?
4. Proteinuria