

華西協合大學

畢業論文

題目：膽石症及七十一個外科病歷之分析

醫學院醫學系

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中華民國二十六年四月

日

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GALL STONES

AN ANALYSIS OF 71 SURGICAL CASES

I. History.

II. Types of Gall Stones.

III. Pathology of Gall Bladder and Bile Ducts.

IV. Clinical Variations.

April 1947

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THESIS SUBMITTED TO THE COLLEGE OF MEDICINE AND
DENTISTRY WEST CHINA UNION UNIVERSITY BY LU CHING
FANG IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE
GRADUATION IN MEDICINE.

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The author is immediately impressed by the well known fact that gallstones are relatively rare in China. Here the average cholesterol content of the serum is significantly lower than in the West. This is to be expected in a population which is living mainly on a vegetarian diet, because the vegetablesterols are not absorbed from the intestinal tract. For this reason, it follows that the pure cholesterol stones which develop especially in women in the West, hardly occur here. Gallstones here are mostly due to inflammation of the gallbladder, therefore, they nearly always form an indication for operation.

This report is a review of literature of the etiology, pathology, clinical manifestations, diagnosis and treatment of gallstones and

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1. Introduction

The central point of interest in the diseases of the gallbladder and bile ducts is cholelithiasis. Gallstones are the most frequent source of symptoms referable to the biliary tract. They are commonly related to the development of a variety of complications, such as cholangitis, liver abscess, jaundice and biliary cirrhosis. Furthermore, they are of undoubted significance in the etiology of primary cancer of gallbladder and ducts. The early recognition of gallbladder is therefore a matter of considerable importance. Modern methods (including cholecystography and microscopic examination of the bile obtained by duodenal drainage) have aided greatly in the diagnosis. The history and physical examination, however, remain indispensable and often sufficient in themselves to suggest strongly the presence of cholelithiasis.

The westerner is immediately impressed by the well known fact that gallstones are relatively rare in China. Here the average cholesterol content of the serum is significantly lower than in the West. This is to be expected in a population which is living mainly on a vegetarian diet, because the vegetablesterols are not absorbed from the intestinal tract. For this reason, it follows that the pure cholesterol stones which develop especially in women in the West, hardly occur here. Gallstones here are mostly due to inflammation of the gallbladder, therefore, they nearly always form an indication for operation.

This report is a review of literature of the etiology, pathology, clinical manifestations, diagnosis and treatment of gallstones and

the analysis of a series of 71 operated gallstone cases in the West
China University Hospital from April 1939 to February 1947.

11. Etiology

1. Mechanism of Gallstone Formation.

Studies as to the cause of gallstones have extensive since they were first described in 14th or 15th century. Early thought was purely speculative, but since the time of Naunyn (1892) a mass of clinical and experimental data has been accumulated. Naunyn made the most ingenious deductions from his clinical and pathological observations. From the character of the soft nucleus of most calculi, its appearance of being actually a mass of detritus, and from the frequency with which the mucosa of the gall bladder exhibited signs of a fatty sort of degeneration, it seems probable that the formation of gall-stones presupposes a morbid change in the mucous membrane. Naunyn regarded the change as a consequence of invasion by the bacillus coli communis i.e. organisms of intestinal origin and the disgreasmed epithelial cells acted as nuclei. The hypothesis of infection was at one time supported by observations from several sources. Some believed that Eberth's bacilli might cause both stone formation and cholecystitis long after the typhoid fever itself had apparently been cured. Gordon-Taylor and Whitby collected the following statistics: The gall bladder is infected in 70% of stone cases. The bile is infected in 40% of stone cases, and the gall-stone is infected in 30% of stone cases. The common organisms they found are B coli, B. Welchi. Streptococcus faecalis and B. Typhosus. Andrews believed that the inflamed gallbladder absorbs water, bile acid and bile salts rapidly but the cholesterol very slowly, if at all, and thus

predisposes to precipitation of the latter. Some other authors considered that as a result of infection the bile may contain a high percentage of proteins and calcium and numerous centers for simultaneous crystallization may occur; the fibrosis of the gall-bladder wall may lead to imperfect absorption of cholesterol.

In a recent review gall-stones were regarded as the result of temporary, functional disorders, tendency to cause precipitation of cholesterol, bile pigments and calcium whether because of an excess of these elements or because of deficient bile salts being unknown. Their formation also seems to require the presence of binding substance derived perhaps from the mucosa of the gall-bladder. There may even be an endocrinal background, since stones are formed primarily during the active sexual life of women, and less often, in more advanced years and in men.

The chemical and physical basis of gall-stone formation is laid down by the changes in the secretion of the biologically active liver cells and not by the changes in the sacs that holds and concentrates the bile and performs no other function. Insufficient concentration of bile salts and fatty acids or an excess of cholesterol will cause gall-stone formation. Hyperactivity of the adrenal sympathetic system profoundly effects the cells of liver and the latter will not secrete a normal quantity of bile salt, and fatty acids. They regarded the local infection as secondary process. If gall-stones are produced by the pyogenic infections, the greatest incidence of gall-stone should occur in early life, at the age of highest incidence of appendicitis of tonsillitis, of tuberculosis and of osteomyelitis. The infections occur early in the life, but the gall-stones occur later. If it were a fact that infection have an affinity for the gall bladder, then acute gall bladder infection should be as

common as tonsillitis, for the liver absorbs every kinds of toxins and bacterias from the intestine, but it does not commonly become infected. The gall bladder and ducts have a natural resistance and they rarely have an acute infection, as duodenum, stomach and intestine, except in the presence of stones which irritate them.

Aschoff-Baumeister's Stasis-hypercholesterolemia Theory: They believed that the concentration of cholesterol in the bile as well as its stability in solution is of much significance in formation of gall-stones since the majority of human gall-stones are composed chiefly of cholesterol. Hypercholesterolemia may be produced by the ingestion of too much cholesterolin containing in food, e.g. eggs, butter and fats, Such excess in the blood may lead to an excess in the bile. Ordinarily, the bile is concentrated from 5 to 10 times in the gall bladder. The degree of concentration is increased when rate of emptying is relatively slow. The gall bladder function is distinctly sluggish during pregnancy, with the result that stasis and further bile concentration are favored. During. During later months of pregnancy and for a time after delivery hypercholesterolemia is marked. It also occurs in convalescence from typhoid fever, myxedema and nephrosis. These undoubtedly are instances of liver damage in which the bile salts concentration is relatively much lower than that of cholesterol with a result of tendency toward precipitation of the latter. Hemmarsten reported that normal bile salts-cholesterol ratio is 25:1 and Newman reported that the critical ratio for precipitation of cholesterol is 18:1, while some others regarded it as 13:1. Some authors believed that the reflux of pancreatic ferment due to spasm of the sphincter acts as a factor leading to precipitation of cholesterol due to a resultant change of bile salt-cholesterol ratio in the gallbladder.

In hemolytic jaundice and pernicious anemia there is a ~~d~~istinct tendency for bilirubin to precipitate or the calcium compound as a consequence to increase of bilirubin concentration in the blood.

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Phemister believed that obstruction of cystic duct by one of the common varieties of stones or by carcinoma may be followed by precipitation of calcium carbonate either in the form of stone, a cast of gallbladder or a soft milky suspension.

In short, there is no one of the many theories already advanced that can satisfactorily explain the various types of calculi found in the biliary tract. Recently Phemister and his associates summarized the causes of gallstone formation as the following:

1. Obstruction
2. Infection
3. Reflux of pancreatic or duodenal secretion
4. Altered cholesterol metabolism
5. Increased bile pigment
6. Over concentration of bile acids with resultant injury to gallbladder wall
7. Reduction in the ratio of cholesterol to fatty acids or bile acids by absorption of bile salts through a damaged gallbladder wall with partial obstruction of cystic duct.

2. Incidence

Fat, fertile, flatulant female of 40 or 50 is the classical sufferer. All American and European writers agree on the predominance of cholelithiasis among women and a rising incidence with age and a distinct coincidental fall in the ratio. Their statistic ratio of women to men is 5-10:1. Their incidence is roughly corresponding to the distribution of hyperthyroidism, peptic ulcer, neurocirculatory asthenia, diabetes, highly emotional temperaments and high scholastic, high executive, and administrative ability. In pregnancy there is increased metabolism with hypertrophy of the thyroid and of the adrenal glands; there is a gain in weight; nervousness and palpitation are present; the organism is stepped up as in the expression of the emotions, in defense against infection, in excessive and fatigue-producing work. Individual less than 20 years of age appear to enjoy a remarkable, but not an absolute, freedom from gallstones. The greater frequency of stones in women may also lie in the fact that the *B. coli* is so common a cause. Women are much more prone than men to *B. coli* infections of the urinary tract which not infrequently follow pregnancy. These infections are almost certainly not limited to the urinary tract, but are a general septicemia. As Barber pointed out, it is a well established fact that disease of the gallbladder occurs with unusually high frequency in some families, especially the members of which are predisposed to obesity, migraine, arteriosclerosis and diabetes, but there is no proof that heredity plays any definite role.

In our series of 71 cases there are 31 male patients(43.7%) and 40 female patients(56.3%). The ratio of sex incidence of male to female is 1;1.3. Therefore the gallstones are about equally distributed in both sexes in Chengtu.

Age incidence

Age (years)	Male	Female
1-10	0	0
11-20	3	2
21-30	11	16
31-40	10	10
41-50	4	9
51-60	2	2
61-70	1	1
	<hr/> 31	<hr/> 40

Among the 40 female patients 37 were married (92.5%). Only 3 (4.2%) of them had never given birth to any child. Parity of the other 34 patients is showed in the following figure:

Number of pregnancy	Number of case
1	7
2	7
3	3
4	4
5	4
6	4
7	1
8	2
11	<hr/> 2
	34

On physical examination of these 71 patients 14 women and 14 men were described as well developed and nourished or fat, that is about 40%

possessing the typical figure of gallstone sufferers.

Only in one case there is a positive family history for gallstone, the mother had suffered from the similar disease.

History of previous infective disease in the gastro-intestinal tract foci of infection:

Name of disease	Number of case	
Typhoid fever	3	} 28.1%
Dysentery	9	
Pancreatitis	1	
Chronic appendicitis	7	
Rhinnitis	1	} 54.9%
Dental caries	25	
Tonsillitis	11	
Sinusitis	2	

Culture of bile--done in 45 cases :

No growth	11 cases
B. coli	18
Gram negative bacilli	4
Streptococcus hemolyticus	3
Gram positive bacilli	2
Non-hemolytic streptococcus	1
B. Typhosus	1
Micrococcus	1
Tetragenus	1
Proteus	1
Gram positive diplococci	1
Streptococcus viridans	1

111. Types of Gallstones.

There are several varieties of gall stones and the pathological processes involved in their formation are not the same for all varieties. Ordinarily they are classified into three groups:-

1. Pure Cholesterin Stones - The stones are usually single, not more than three-fourths of an inch in diameter, oval in shape, nodular on the surface, semitransparent, and of a waxy consistency. The cut surface is amorphous in the outer layers and may have undergone a secondary crystalline change in the central portion. As with other varieties of calculus, they are more commonly seen in stout middle aged women who are usually married and have usually had children. Aschoff calls this a metabolic stone because it is apparently formed solely as the result of disordered liver metabolism.

2. Pigment calculi - Multiple and much less common. The pigment may be either bilirubin or bileverdin. The former are most commonly seen in the obstructed common bile duct where they form putty-like masses filling the lumen of the duct, whereas the latter are found most commonly in the gall bladder when they appear as small irregular dark green or almost black friable masses resembling small cinders. If they are present in the gall bladder, they soon set up a cholecystitis and then they become coated wholly or in part by a layer of cholesterin. The stones which are sometimes found in the hepatic ducts of young children and those which are formed in dilated and infected ducts are always composed of pigment calcium and contain little or no cholesterin. In diseases in which there is a profound destruction of red blood cells, gall stones usually of this are frequently found, e.g. the later stages of acholuric jaundice and severe cases of malaria.

3. Mixed Stones (Infective or septic stone) - Faceted cholesterol-pigment calcium stones are found in mulberry gallbladder. They are variable in size, shape and number, but on section they are nearly always laminated. The layers are alternately formed by cholesterol and pigment calcium. They may be single or multiple and the latter are nearly always faceted, because as growing in size, they fit into one another. Hence if there is a collection of only two or three stones, they may be barrel-shaped, with facets at either end, but if there is a large number, they fit into one another to form a compact mosaic. If single, they are frequently large and may entirely fill the gall bladder or may ulcerate through the gall bladder and pass into the intestine. They are roughly nodular in appearance. These surface nodules fit closely into the irregularities of the gall bladder mucosa. They are formed in a medium rich in protein. As the result of inflammation of the gall bladder a mixture of pus, mucus, bacteria and epithelial debris is poured out. During an acute attack the gall bladder is more or less a closed cavity, but as the swelling at the neck subsides, bile again enters, and around the little nuclei of organic matter layers of cholesterol and bilirubin calcium are deposited. In this manner the faceted septic stone is formed.

The time of stone formation is not known, but the original period of precipitation probably is short. Cameron mentioned a study in which the fact was surgically verified that stones formed within 2 months^h and it is well known that concretions of calcium bilirubinate may form in the bile passages of experimental animal within 3 weeks.

The situation of stones in the biliary tract obviously has a great deal to do with the nature of the symptoms of which complaint is made. According to Walters and Snell, in more than half of all cases, stones are confined to the gall bladder, in 10 to 15% of cases the gall bladder and cystic duct contain stones, and in about an equal number of cases stones exist both in the

gall bladder and the common duct. In about 6% of operated cases stones are found only in the common duct.

In our series of cases:-

Location of Stone	Single Stone	Multiple Stones
Gall bladder	8 cases	16 cases
Neck of gall bladder	2 "	5 "
Cystic duct	5 "	6 "
Common duct	12 "	24 "
Hepatic duct	1 "	4 "
Intrahepatic(left lobe)	0 "	1 "

Type of stones diagnosed by the pathologists:-

Cholesterol stone	Single	Multiple
Cholesterol stone	2	5
Pigment "	4	10
Mixed "	0	4
Oxalate "	2	0

Since the chemical analysis of the stones was not done and the pathological report was not complete the discussion of the types of stones found in these cases is impossible.

IV. Pathology of Gall bladder and Bile ducts.

Gall stones of the ordinary type are always associated with inflammation of the gall bladder. The cholecystitis is usually chronic in character, but not infrequently an acute attack may be superadded. In general the pathologic lesions are then those of the various types of uncalculous cholecystitis together with the added feature of the presence of a foreign body which may or may not interfere with evacuation of the gall bladder, or which may or may not incite an acute inflammatory reaction.

At operation on patients who have chronic inflammatory types of cholecystitis the serous coat usually is opaque and the walls are definitely edematous and thickened. There may be adhesions to the adjacent viscera (pericholecystitis) and lymph nodes in the vicinity, particularly the cystic nodes are enlarged usually. The bile is ordinarily dark and tarry but in some instances it is thin and watery. In either of the foregoing types of bile sandy material fibrin or desquamated epithelium may be found. Occlusion of the cystic duct by edema or cicatricial change, is of course the factor which alters the pathologic picture.

The microscopic appearance of the gall bladder are variable, ranging from slight edema and fibrosis of the wall of the gall bladder with hypertrophic or hyperplastic changes in the mucosa, to instances of atrophic or sclerosing cholecystitis, with atrophy and destruction of the mucous membrane. In some instances epithelial proliferation and the formation of small cysts may be noted; this condition is described as "cholecystitis cystica" or "cholecystitis glandularis proliferans." A patchy inflammatory process with local ulceration, chronic ulcerative cholecystitis, also has been described. In this condition fistulous connections with the intestinal tract may form, even in the absence of stones.

The strawberry gall bladder, the best known type of pathologic change resulting from metabolic cholecystic disease, derives its well known and characteristic appearance from deposits of cholesterol esters which stud the mucosa of the gall bladder. The condition is often associated with papillomatous lesions of the mucous membrane. The papillomas themselves are heavily infiltrated with deposits of cholesterol. Pure cholesterol stone is a silent stone, and as a rule the gall bladder containing such stone shows no evidence of inflammation. It may, however become impacted in the neck of the gall bladder, and the acute stasis resulted from this process is apt to be followed by infection.

Calcified ossified or procelain gall bladder is rare and its pathogenesis is not well understood. Robb regarded this condition as a terminal process of long, standing chronic cholecystitis in which tissue necrosis and fibrous changes in the gall bladder finally lead to deposition of calcium. It is usually enlarged with greatly thickened wall, and completely destroyed function. The pathological process involved is evidently very chronic since the condition is not often associated with severe symptoms, the principal feature may be the palpable gall bladder which gives the impression of carcinoma.

The general sequelae^{of} stones may be either infective or mechanical. Recurrent bacterial invasion so frequently associated with the presence of stones, eventually will produce a mixed picture of subacute chronic cholecystitis, with progressive destruction of the mucous membrane, thickening and fibrosis of the wall of gall bladder and pericholecystitis. In many instances the surgeon describes the gall bladder as functionless thick-walled, and contracted down upon its contents. However, a stone may be impacted in the cystic duct, so that, the gall bladder becomes distend-

ed with mucus (hydrops) and yet at the same time it may contain numerous calculi. As the result of changes in the chemical constituents of bile layers of calcium carbonate may precipitated about the stones that are already present in the organ. The opportunities for infection of the wall of gall bladder and of its fluid contents are also greatly increased by occlusion of the cystic duct, and then acute and chronic empyema of the gall bladder are common sequelae.

When the gall bladder walls are deeply infected and the muscular layers are destroyed, infection may spread to surrounding organs producing adhesions, and causing hepatitis, pancreatitis, chronic appendicitis, or ulceration of duodenum or stomach or both. Diverticula of the gall bladder or of the cystic duct may also form in the presence of stone. Internal fistulae communicating the gall bladder with other organs are ~~not~~ almost invariably attributable to ulceration of the wall of gall bladder caused by the pressure of stones. Should it perforate into the transverse colon the stone is likely to be passed without trouble. When the perforation is into the small bowel the stone, if large, is apt to become impacted some distance above the ileocecal valve and even be sufficient to cause an obstruction of the intestine. If the stones gain entrance to the common duct, obstructive jaundice is to be expected. Ulceration of the mucous membrane of the gall bladder or ducts by "fretting" or pressure of a stone may lead to local hemorrhage and profuse bleeding may take place both from the gall bladder and from lesions of the duodenum.

Stones in the common bile duct may be associated with infection which occasionally leads to the accumulation of pus in the common duct above the stone. If the obstruction is complete, not accompanied by infection, and being of sufficient duration the bile pigments disappear, and mucus secreted

by the wall of the duct accumulates within its lumen. This indicative of at least a partial suppression of bile formation and is usually considered as a serious sign so far as prognosis is concerned. In spite of the fact that obstruction by stone in the common duct causes a retention of bile in the biliary tree, the gallbladder is rarely dilated due to the fact that the infection in the wall of gall bladder has resulted in the deposit of so much fibrous tissue that distension is impossible as expressed by Comvoisier's law.

When the ampula of Vater is large and receives both bile duct and pancreatic duct, and opens by a narrow orifice, the occlusion of this orifice by a small stone may cause the retrojection of bile into the pancreatic duct, an occurrence which is followed by acute hemorrhagic necrosis of the pancreas, and all its sequelae.

In the liver itself obstruction to the escape of bile soon causes rupture of the walls of the bile capillaries through the process destroying the liver cells which form those walls. This probably is not merely due to a mechanical effect, but also due to the poisonous action of the bile as well as to the enforced inactivity of the cells. Extensive necrosis in the liver following in the wake of obstructive jaundice has been described and thought as the underlying ^{cause of} the scarring in the so called biliary cirrhosis.

In our series of cases, during operation, adhesions around the gall bladder or to the surrounding organs were found in most ^{of} the cases:-

Pericholecystic adhesion	17 cases
Adhesion to duodenum	11 "
" " liver	8 "
" " omentum	7 "
Wrapping by omentum	5 "

Adhesion to colon	5 cases
" " jejunum	3 "
" " appendix	1 "
" " lesser calvative of stomach	1 "
" between liver and omentum	1 "
" " " " abdominal wall	3 "

Perforation of gall bladder was found at neck in 3 cases and at the base in 2 cases. Empyema of the gall bladder was found in 5 cases.

The gall bladder was found dilated and distended in 39 cases and 1 hydrop was reported. It was found contracted in 15 cases. Thickening of the wall found in 26 cases. Cholecystitis granularis found in 3 cases. Typical strawberry gall bladder was reported by the pathologist only in 1 case. In pathological report of gall bladder 20 cases were chronic fibrotic cholecystitis, 14 are chronic cholecystitis with acute exacerbation, 2 subacute and 16 acute cholecystitis.

White bile was found in the gall bladder in 2 cases.

Cholecystoduodenal fistula found in 1 case, and external fistula found in 2 cases.

Acutely kinked, s-shaped cystic duct found in 2 cases.

In one case 3 hepatic ducts were found.

The common duct was found to be dilated in 30 cases and thickened in 6 cases. Cystic duct dilated in 5 cases, thickened in 4 cases. Suppurative cholangitis found in 2 cases.

Adenoma of common duct found in 1 case, and adenopapilloma found in 1 case.

Congenital abnormality of sphincter of Oddi presents in 1 case.

Hypertrophy of the regional lymph nodes was mentioned in 6 cases, 1 of which showed caseous change.

Peritoneal thickening found in 4 cases.

Portal thrombosis found in 1 case.

Chronic hepatitis found in 2 cases.

Multiple liver abscess found in 1 case.

Pancreas was found enlarged in 3 cases, head indurated in 2 cases.

Granular but not indurated in 1 case.

V. Clinical Manifestations.

There is no uniform relation between the severity of the symptoms and the size, number and type of stones, or between the severity of the symptoms and the effects which may be produced by the stones on the gall bladder itself. Rolleston considered them under 5 headings:-

1. ~~Masked~~ or Inaugural Symptoms: The clinical picture produced by gall stones depends on their location. When in the gall bladder stones are frequently silent or causing only mild symptoms of dyspepsia. They are essentially those of the associated cholecystitis and Hurst commented on the dyspeptic symptoms saying that symptoms resembling those of ulcer may arise,, but on the fact that such symptoms are not significantly improved by the usual methods of management employed in a case of peptic ulcer, and the regular time sequence so characteristic of ulcer may be vague or lacking. In general the dyspeptic symptoms of gall stones are more severe and persistent than those associated with non-calculous cholecystic disease, and often they persist for years with relapses and remissions, not infrequently punctuated by biliary colic. "Food selection" is a common accompaniment of gall stones, and frequently it is the patient's principal complaint. Patients often reduce their diet gradually, omitting one article of food at a time in hope of avoiding post-meal distress. By such doing individuals may be eventually an eccentric dietary and suffer from nutritional disorders accordingly. Another common complaint is dull constant pain in the region of the gall bladder, being frequently of an aching or "rheumatic type". A similar type of pain may be present also in the region of the lower ribs posteriorly. Projection of pain to other region is uncommon. Jolting and sudden pressure on the lower ribs aggravate distress of this type and patients often complain of their inability to

wear tight articles of clothing. Heart burn or bitter and acid regurgitation may be present. Sometimes patients develop faintness, nausea, sweating of face and neck and a sense of great prostration may be followed by vomiting. Slight sense of chilliness and of shivering usually occurs especially in the evenings. Fever of low grade and general, mild systemic manifestations of infection may be attributed to absorption of toxic material from an infected and stone-filled gall bladder.

2. Biliary Colic: There is no general agreement as to the exact mechanism of which biliary colic is produced or as to the nervous pathways by which the sensations of pain are conveyed. The usual explanation is that pain is produced by contraction of the gall bladder on its contents, or by the gall bladder contracting against the back pressure offered by the sphincteric mechanism in the neck of the gall bladder or that at the end of the common duct. Tollinger, after his experiment on physiologic mechanism of colic, concluded that biliary colic is a true visceral pain and that referred pain which extends to the right scapula is attributable to inflammation and to the setting up of a peritoneal-cutaneous reflex. Colic may be without identifiable cause, it also appears to be brought on by a variety of causes, namely jostling, jarring, an unusually heavy meal, physical exertion, medical examination (including cholecystography) and possibly by the development of minor intercurrent infections proceeds which set up an irritation in the gall bladder and which excite contraction. Nocturnal seizures are characteristic of biliary colic. As a rule, the pain is apt to occur in paroxysms with tenderness and aching remaining in the remission. It often passes off as suddenly as it began even when narcotics have not been given. The usual site of origin is the epigastrium, but a point in the right upper quadrant of the abdomen corresponding to the

situation of the gall bladder usually becomes the center of pain. Infrequently the pain may begin in the back and projected anteriorly, left-sided pain is not particularly uncommon and it has been suggested by Libman that contralateral pain of this type is more commonly noted by hypersensitive individuals. The pain may extend into the thorax, thus simulating angina pectoris, but the most frequent site of extension of the pain is around the lower ribs to a point beneath the right scapula. Pain extended to the right shoulder is somewhat uncommon and usually is attributable to peritoneal involvement and irritation of the diaphragm. The patients may writhe in agony, perspire profusely and often has a rigor. Respiratory embarrassment, both objective and subjective is common. The pulse rate, as a rule, is not greatly increased, it may rise as inflammatory processes develop. Slight fever is a common accompaniment even of uncomplicated colic. Belching, nausea and retching are common accompaniments of the pain. Vomiting may be a troublesome feature, particularly if a stone becomes impacted in the cystic or common duct.

3. Mechanical Effects of Gall Stones: Stones may cause symptoms of mechanical origin when they make pressure on adjacent structures.

(1) Pressure on portal vein may cause portal thrombosis, and local adhesions and hepatic damage associated with the stone may complicate the process considerably.

(11) A stone filled, distended gall bladder may be angulated and bound down to the common duct to compress the latter and cause obstructive jaundice, a large stone in the cystic duct may have the same effect.

(111) The mechanical effects of stones within the ducts are of considerably greater clinical importance. Rupture of the gall bladder attributable to back pressure is rare and usually is associated with acute

cholecystitis with perforation. When the cystic duct is obstructed by calculus in the absence of infection, the gall bladder becomes greatly distended, the bile pigments and salts may be gradually absorbed with a resultant mucous cyst formation. Hydrops formed in this way may reach considerable proportion and the viscus may contain a liter or more of fluid and debris. On palpation, a hydropic gall bladder has a distinct cystic "feel", movable, and often not very tender. Its situation and the biliary usually serve to identify the condition. If stones reach the common duct, obstructive jaundice ensues, with dilatation of the intra-hepatic and extrahepatic bile passages. This tends to suppress the normal biliary flow. There is often continued production of mucous secretion filling the biliary tract with so called "white bile". The process is ordinarily complicated by infection and fibrosis.

(IV) When there is a stone in the ampulla the pancreas may become injured if the pancreatic ducts are occluded by direct pressure from stone and the bile is allowed to reflux into them. Thus cystic dilatation or rupture of the pancreatic ducts may occur on acute pancreatitis with fat necrosis may develop. Chronic pancreatitis with local induration and edema, however, is more commonly found.

(V) Obstruction of the intestinal tract by gall stones is a much more common phenomenon in the time before Lister. Stones may possibly migrate through the cystic and common ducts, but this route is certainly not the common one, the usual route is by way of an internal fistula. Calculi, whether single or multiple, may pass into the bowel without any unusual symptoms other than biliary colic and subsequent manifestations of acute cholecystitis.

4. Inflammatory or Infective Effects of Gall stones: The presence of

of stones acting as foreign bodies may result is lightening up of the latent infection and may lead to the development of cholecystitis, which is characterized by progressively increasing damage to both the mucosa and the walls. Chronic fibrosis cholecystitis is another common result. Empyema may be the result of infection and suppuration. Perforation from suppurative cholecystitis may occur; if the infected material enters the peritoneal cavity the result may be general peritonitis. Much more frequently a walled off abscess forms which may partially resolve or discharge its contents into an adjacent viscus. When infection and obstruction combine to involve the gall bladder, the result may be acute suppuration, or, more often, chronic fibrosis of the bile passages and hepatic parenchyma. The grade of fever is dependent largely upon the amount of associated infection, and will be accompanied by the usual bile manifestations. Occasionally the fever is intermittent type (Charcot's hepatic fever) produced supposedly by the ball valve action of the stone are the sphincter of Oddi. Jaundice will diminish or disappear if the stone becomes dislodged or the associated infection and edema subside. If the infection spreads by travelling up the bile ducts (cholangitis) chills may be encountered.

5. Biliary Fistulae: The highest incidence of fistulas by age appears to be in the 7th decade of life (records of the Mayo Clinic). There may be either internal or external biliary fistulas.

(1) Internal Biliary Fistulas:- The most common types are cholecystocolonic and cholecystoduodenal fistulas. Most internal fistulas lead from the gall bladder particularly the fundus portion being a favorite site of origin. Less commonly they arise from the common or cystic duct. The usual history is that of chronic cholecystic disease with colic, jaundice and symptoms of acute cholecystitis which are more

or less miraculously relieved after a severe attack, indicating that the gall bladder had emptied its contents into the intestinal tract. The symptoms then may be chills, high fever, and diarrhea. The obvious interference is that ascending infection of the bile passages arose from the site of fistulous tract. In their presence cholecystectomy carries with somewhat increased operative risk; peritonitis is a fairly frequent complication.

(11) External Biliary fistulae:- They may be of spontaneous occurrence but much more often the result of a previous operative procedure. The usual site of the former is at or near the umbilicus. The falciform ligament probably directs the course of the fistula to this point. The post operative biliary fistulas usually are confined to the region of the surgical incision and almost invariably referable to persistent obstruction somewhere along the course of extrahepatic biliary passages or to the presence of a residual portion of the gall bladder. The effects of long, continued external biliary drainage on the affected individual are of considerable importance. The loss of bile although serious, requires a longer time to produce severe symptoms; however, the loss of minerals, interference with digestion of fat and the failure of absorption of fat soluble vitamins may ultimately interfere with nutrition. The dilatation and infection of bile passages which accompany external fistulae may lead to hepatic dysfunction. It is not uncommon for a fatal hemorrhagic diathesis to develop following attempts at surgical repair, a situation which obviously is attributable to lack of absorption of vitamin K from the intestinal tract.

The duration of the active symptoms in our series:-

Acute onset without previous history of attacks	8 cases
Repeated attacks for less than 5 months	2 "

Repeated attacks for less than 5 months to 1 year 9 cases.

"	"	"	"	"	1 to 2 years	9	"
"	"	"	"	"	3 to 5 years	12	"
"	"	"	"	"	6 to 10 years	17	"
"	"	"	"	"	11 to 15 years	5	"
"	"	"	"	"	16 to 20 years	5	"
"	"	"	"	"	21 to 25 years	1	case
"	"	"	"	"	25 to 30 years	2	cases
"	"	"	"	"	40 years	1	case

In 12 of the 71 cases there is only history of dyspepsia and no attack of biliary colic (16.9%). Seventeen of the other 59 patients who had had colicky attacks had the starting symptoms as dull pain on the epigastrium.

Location of biliary colic

R. U. Q.	27 cases.
Epigastrium	35 "

Location of referred pain

Right shoulder	6 "
Both shoulders	4 "
Right scapular region	5 "
Left " "	1 case
Right chest	1 "
Middle of back	7 cases
Lower abdomen	2 "
R. U. Q.	1 case
Umbilicus	3 cases
Lumbar region	4 "

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History of jaundice is found in 37 cases (62.7%) among the 59 patients who had had colic.

During the attacks of colic 34 had feverishness, 31 had chilliness, 21 had sweating, only 1 had rigor, 12 had belching, 30 had nausea and 54 had vomiting.

28 patients had history of constipation, 7 had diarrhea and only 3 noticed, clay-colored stools. Bile-stained urine was mentioned by 10 patients.

On physical examination 44 patients were found to have abdominal rigidity and 51 have tenderness.

Location of the rigidity	Number of case
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R. U. Q.	25
----------	----

R. U. Q. and epigastrium	10
--------------------------	----

Upper abdomen	4
---------------	---

Generalized	3
-------------	---

R. U. Q. & R. L. Q.	2
---------------------	---

Location of tenderness	
------------------------	--

R. U. Q. only	27
---------------	----

R. U. Q. and epigastrium	10
--------------------------	----

Upper abdomen	2
---------------	---

Epigastrium	8
-------------	---

Lumbar and R. U. Q.	3
---------------------	---

R. U. Q. and R. L. Q.	3
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Cutaneous hyperesthesia was found only in 5 cases. 1 localized in epigastrium and 4 in R. U. Q.

Murphey's sign is positive in 34 cases (47.9%), and Boas's sign in 1 case. In 4 cases rebound tenderness was found in R. U. Q.

Jaundice was found in 34 cases.

Splenomegaly found in 14 cases, enlargement of liver in 25 cases and palpable tender gall bladder in 22 cases.

Pulse rate: About 60% in all the cases had normal pulse rate; 25% showed moderate increase and 15% showed marked elevation.

Temperature: Thirty two patients had normal temperature. 14 cases had an average from 99 to 100°F, 22 had 100 - 102°F and 3 had 102-104°F.

Respiration rate was normal in 56 cases, 10 had moderately increased rate and 5 had markedly rapid respiration.

VI. Diagnosis

The criteria for diagnosis of cholecystic diseases for which operation is required include:-

1. History:- The classical symptoms of cholecystitis with stones are biliary colic and the residual soreness- a satisfactory account of one or more attacks of colicky pain in the epigastrium or right upper quadrant and the residual tenderness in the region of gall bladder following such painful episodes. Within 6 to 48 hours gross jaundice usually appears. The stone and mucous membrane become yellow, and bile pigment appears in the urine. The stools will be clay-colored because of their lack of bile pigment. If the stone is lodged above the opening of pancreatic duct, there usually are constipation, dry and clay-colored stools. If it is below, bulky, clay-colored stool, containing fat with offensive odor. Flatulent indigestion with distress after full meals, especially of fatty or coarse foods is quite diagnostic.

2. Physical Examination:- The examination of subjects who have cholecystic disease ordinarily reveals little, especially of the patient is seen in the interval between attacks. On the other hand it is usually difficult to make satisfactory examination of the abdomen in the course of an attack of actual colic. On palpation the liver may be found to be somewhat enlarged, and the region of the gall bladder exquisitely tender, there is often considerable defensive spasm of the right rectus muscle. Residual deep tenderness is probably an expression of an inflammatory process in the wall of the gall bladder. If continuous gentle pressure is exerted over the right hypochondrium while the patient takes a deep breath, there is a "catch in the breath" just before the zenith of the inspiration. This is so called Murphy's sign. Cutaneous

hyperesthesia often is noted following an attack, usually most pronounced over the gall bladder, but there may be a hyperesthetic zone over the lower ribs, and ribs may themselves be sensitive on pressure. There is usually an area of epicritic hyperesthesia posteriorly between the 9th and 10th dorsal segments on the right side, and this is called Boas' sign. Splenomegaly may be present due to hemolytic ~~etems~~ or to that of chronic hepatitis secondary to stone in common duct. The condition of skin may of diagnostic significance, xanthelasma factitious dermatitis and melanosis are not worthy findings in cases of cholecystic disease, especially if there have been previous episodes of jaundice.

3. Laboratory Findings:-

(1) Cholecystography - This is the most important laboratory procedure in the diagnosis of the gall bladder disease, it may show the evidence of a non-functioning gall bladder or of the presence of stones. Direct visualization is dependent on the quantity of bile pigment and calcium salts present. The negative shadows indicate only a possibility for pure cholesterol stones. The faceted mixed stones usually show small, Moderately opaque shadows with a clear center, a dense periphery and a polygonal or faceted outline. The bile sand will show multiple punctiform opacities and the calcium carbonate give a single and round or barrel-shaped shadow calcified gall bladder with extensive preexisting fibrosis may be clearly visible on plain radiogram showing an ovoid outline. With the intake of the radio-opaque dye as opacal. Some pathological change of the gall bladder wall and the radiolucent stones may be demonstrated. When gall stones are present and the dye fails to depict the gallbladder, the stones are often demonstrable as dense transradiant spots. When the gall bladder is depicted by dye, gallstones should not escape observation, for those

that contain sufficient calcium appear as more intense spots in the shadow of dye. In about 50% no shadows of stones could be obtained for the stone is blocking, the cystic duct or the gall bladder mucosa being so damaged that it cannot concentrate the dye. The preoperative diagnosis of gastro-intestinal-biliary fistulas entirely depends on roentgenography. Roentgenographic demonstration of ingested barium, or gas, or both in any segment of biliary tract is presumptive evidence of fistulous communication with the gastro-intestinal tract, since the sphincter of Oddi usually is so spastic and the pancreas so swollen that they effectively obstruct the ampulla of Vater. The reflex regurgitation of the meal or gases through an atonic sphincter of Oddi or along the atonic common bile duct occurs very infrequently and presents certain signs. The emphysematous cholecystitis usually is confined in the gall bladder.

Roentgenograms of the kidney, ureter, bladder, thorax and gastro-intestinal tract is desirable in the investigation of patient presumed to have cholecystic disease to rule out other possibilities.

(11) Examination of the Blood - Ordinarily this gives little help for diagnosis during or following acute cholecystitis.

(a) White cell count - Leucocytosis may follow biliary colic and may be a feature of acute or subacute cholecystitis.

(b) Sedimentation rate - In the presence of biliary and hepatic disease so many factors may alter the sedimentation time, that little reliance can be placed on it for practical diagnostic purposes. However, in presence of a rapid erythrocytic sedimentation time together with leucocytosis and fever the onset of a suppurative process, empyema or gangrene should be suspected.

(c) Blood chemistry - This is not often affected except that

the concentration of serum bilirubin may be elevated, and that severe and prolonged vomiting may produce elevation of blood urea and diminution in plasma chlorides. Hyperglycemia is occasionally seen, probably because of the presence of mild or latent diabetes. Serum lipase and amylase may be elevated in presence of pancreatitis. The cholesterol content and the bile salt-cholesterol ratio are also worthwhile to determine. Prothrombine time may be prolonged due to lack of absorption of vitamin k from the intestinal tract.

(d) Wasserman or Kahn tests of blood are important in the exclusion of tabes and visceral syphilis.

(e) Van der Bergh test - A direct Van den Bergh may be present for a few days after an attack of colic but it is not of diagnostic value since there is rarely a pure obstructive jaundice in cases of cholelithiasis.

(III) Urinalysis - Albuminuria and cylinduria may be noted in older individuals and temporary of Glycosuria occasionally may occur. Examination of urobilin and urobilinogen is necessary only in presence of jaundice.

(IV) Diagnostic duodenal drainage - Lyon's test - The physical properties, histologic examination, crystallography, bacteriology, parasitology and chemistry of the bile drained from different portions of the biliary passages usually helps in diagnosis especially to the nature of the stones.

4. Differential Diagnosis - Reasonable exact exclusion of conditions that simulate cholelithiasis is important for the diagnosis especially as question of operation is concerned.

(1) The dyspeptis characteristic of cholecystic disease is most commonly confused with reflex pylorospasm associated with constipation and intestinal irritability and the aerophagia of nervous individuals. There may be a definite tendency to remission and exacerbations in the presence of all the complaints, but calic attack with jaundice and residual tenderness will never develop. G-I series is also valuable in exclusion of these conditions.

(11) Prostatic carcinoma with spinal metastain may produce root pains simulating the pain of gall bladder disease. This condition can be ruled out by rectal examination.

(111) Appendicitis - The pain, vomiting, constipation, fever, leucocytosis are very similar to those of cholecystitis but the site of localized pain is different. On palpation whether the swelling is continued with or separated from the liver is of prime importance in differentiation. A previous history of jaundice or biliary colic may be of great assistance.

(1V) Inflamed duodenol ulcer - In the case of a duodenal ulcer which is threatening to perforate and has caused periduodenitis. The local findings may be similar to those of cholecystitis with local peritonitis, but a careful inquiry into the history will serve to distinguish them. The diagnosis of ulcer may be confined by noting deformity of the duodenal cap and evidence of combination of retention and hyperperistalsis of the stomach as observed by x-ray after administration of a barium meal.

(V) In hepatitis the tenderness is all over the liver, including the lateral aspect as ascertained by pressing the lower intercostal spaces laterally, as well as in the right hypochondrium.

(VI) In the right basal pleuro-pneumonia or diaphragmatic pleuring fever is usually higher (104-105°F); there may be initial rigor. The right hypochondriac tenderness is more superficial, and there should be rigors at the base of right lung and pleura.

(VII) With rupture of the gall-bladder on one of the bile ducts there are usually the history and symptoms suggestive of biliary colic or cholecystitis, with a gradual extension of the painful area downwards until the whole abdomen is tender. Distension of the intestine increases and there is tenderness on rectal examination. Free fluid may sometimes be demonstrated.

(VIII) Complete obstruction by a biliary calculus sometimes simulates carcinoma of the head of pancreas, bile ducts, or adjacent parts of the bowel or stomach. Such malignant disease, however, usually begins insidiously being painless, and is manifested by cachexia and enlargement of the gall bladder (Courvoisier's law).

Blood examination in our series of cases:-

(a) White count

No. of white blood cell per cum.	No. of case
4000-6000	1
6000-8000	10
8000-10,000	12
10,000-12,000	10
12,000-14,000	8
14,000-16,000	8
16,000-18,000	5
18,000-20,000	9
20,000-22,000	4

22,000-25,000

1

25,000-30,000

1

30,000-35,000

2

(b) Sedimentation rate - done only in 6 cases, 2 had 10-20 mm; 2 had 30-40 mm; 1 had 50-60 mm & 1 had 70-8- mm.

(c) Kahn test were done in all the cases. 13 of them showed positive result.

(d) Feteric index - done in 43 cases.

5-10 units	10 cases
11-20 "	8 "
21-30 "	4 "
31-40 "	4 "
41-50 "	3 "
51-60 "	3 "
61-70 "	3 "
71-80 "	6 "
100 "	1 case
150 "	1 "
200 "	1 "

(e) Van dem Bergh Test - done in 47 cases.

Prompt reaction	16 cases
Delayed "	17 "
Biphasic "	7 "
Negative	7 "

Quantitative test of bilieubin

Trace	16
Below 1 mg	5

1-3 mg	9
3-5 mg	6
5-10 mg	5
10-15 mg	2
15-20 mg	3
40-50 mg	1

(f) Prothimbine time - done in 14 cases

Below 10 minutes 12 cases

11-15 minutes 2 "

(g) Amylase - done in 3 cases

64 units 1 case

80 " 1 "

256 " 1 "

(h) Blood cholesterol content - only done in 1 case which showed normal value as 147 mg. per 100 cc.

Urinalysis

(a) Albuminuria

Trace in 2 cases

± 2

±± 1

±±± 1

(b) Glycosuria

Trace in 1 case

± 2 cases

(c) Foam test - positive result was mentioned in 9 cases

(d) Urobilin - formed positive in only 1 case

(e) Urobilinogen - formed positive in 2 cases.

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Clay-colored stool was mentioned only in 1 case.

Lyon's test was done in 3 cases. One showed cholesterol crystals and pus cells with B. coli growth in the culture of bile; one showed only W.B.C. in bile; another showed nothing significant.

Flyroscopy of the abdomen was done in 20 cases. Among which 17 showed negative finding, 1 showed radio-opaque shadows; 1 showed biliary fistula; the other showed a distended gall bladder.

Cholecystography was done in 4 cases. In 3 of them opacal was used and in 1 cholepulvis was used. Gall bladder was not visualized in 3 cases and calcified gall bladder was found in 1 case.

Preoperative diagnoses in this series of cases:-

Chronic cholecystitis with cholelithiasis	29 cases
Chronic cholecystitis with acute exacerbation and cholelithiasis	17 "
Acute cholecystitis with gall-stone	18 "
Enlargement of gall bladder due to ?	1 case
Chronic osteomyelitis	1 "
Biliary colic due to ascaris	3 cases
Perforated peptic ulcer	1 case
Ruptured acute cholecystitis c gall stone	2 cases
Liver abscess	2 "
Cholelithiasis with pancreatitis	3 "
" " empyeme of gall-bladder	4 "

VII Prognosis:-

Cholelithiasis is rarely fatal, but such accidents as rupture, or perforation of the gall bladder, acute obstruction of the intestines with stone, broncho-biliary fistula, acute hemorrhagic pancreatitis and occasionally stricture of the bile ducts make the prognosis uncertain.

The common causes of death are:-

1. Cessation of the liver function as heralded by the secretion of "white bile".

2. Suppurative cholangitis Intermittent hectic fever of Charcot is ushered in by a rigor, and later the temperature chart shows sudden elevations, precipitate descents and completes intermission. Jaundice deepens and an enlarged, tender, liver can often be detected. Unless the bile passages are drained at the earliest possible moment the condition is nearly always fatal.

3. General peritonitis due to perforation of common duct through an ulcer caused by pressure of the gall stones.

In our series there is no one case died before the operation, but, one of the 6 deaths after the operation should be considered as caused by the effect of gall-stones.

VIII. Treatment

1. Prophylactic - Since hypercholesterinemia, infection of the gall bladder and stones of bile appear to favor the formation of gall-stones individuals who have had acute cholecystitis, particularly if they are fat, should be restricted from the intake of fat; avoid overeating, and take a reasonable amount of exercise. Whenever possible, foci of infection about the tonsils, sinuses, and teeth should be removed. The bowels should be kept free and plenty of water be ingested.

2. Medical - Control of diet is of great importance. Food should be low in fat and cholesterol with using of bile salts and combined with laxatives. Administration of olive oil or oleic acid is supposed to be helpful in stimulating excretion of bile. For relief of acute attacks and colic heat must be applied to the abdomen, and hypodermic injection of morphine combined with atropine is required to relieve the excruciating pain. All gall stones cannot be dissolved. It is generally realized that medication merely allays the active manifestations of cholelithiasis. Therefore, whenever the symptoms do not yield to medical treatment, and inflammation and infection of the gall bladder and biliary tract persist, or when the general health is failing, operation is the best form of therapy.

3. Surgical - During the first era of surgical treatment of gall-stones, cholecystostomy with removal of stones from the gall bladder was performed, but because of that the factors which produced the gall stones or the associated cholecystitis is still remained in the unremoved gall bladder wall, this method of treatment was soon

abandoned. In the second era not only the gall stones but the infected wall of gall bladder were removed by the procedure of cholecystectomy. Little attention however, was paid to the possibility of associated common or hepatic duct stones unless they had produce obstructive symptoms as indicated by an associated jaundice. In the third era the attempt is plainly that when a patient is operated upon for gall stones, all the stones including those in the ducts, should be removed. The indications for opening and exposing the ducts are:- The presence of a thickened or contracted gall bladder, the presence of a dilated duct, the presence of a palpable or suspected as palpable stone, and the presence of a thickened head of pancreas. Even if there are no stones found but merely infection of the ducts is present, it will be valuable to produce internal drainage by dilatation of the sphincter of Oddi and external drainage for 12 days by the introduction of a T-tube. Long continued infection within the ducts is undoubtedly more frequently the cause of formation of stones within the duct than is their passage from the gall bladder into the ducts. In experienced hands exploration of the ducts not only does not add to the immediate risks of operations for gall stone, but undoubtedly diminishes the eventual mortality and morbidity. Drainage of the wound functions as a safety valve since there may be accessory cystic ducts (biliary passages extending directly from the gall bladder into the liver) or there may be accumulation of blood or serum under the liver. The drains should be remained undisturbed for 2 days particularly if infection is present. The drains are inserted to establish a temporary sinus for leading the discharge of fluid to the exterior. About 7 days

are refined for such a sinus tract to be well formed sufficient to allow adequate drainage of the region where drainage is needed.

The treatment for biliary fistula is wholly surgical and should not be delayed. Removal of any obstruction to the ducts is the first prerequisite since spontaneous closure may be expected, if the ducts are patent. Transplantation of the fistula into the stomach or duodenum when obstruction to common duct could not be relieved is the method of choice. (Still many other methods such as choleducojejunostomy or cholecystojejunostomy etc.). After operation the configuration of the common duct and its ability to empty bile adequately into the duodenum are determined by injecting a radio-opaque substance into the T-tube and studying the common duct under the roentgenoscope and by roentgenograms. The choledochography will reveal the presence of overlooked stones, persisting pancreatitis with narrowing of bile duct, the presence of a disturbance of the sphincter of Oddi, and reflux of bile into the duct of Wirsung.

Name of operation formed in our series of cases:-

Cholecystostomy	2
Cholecystectomy	20
Choledocostomy	4
Cholecystectomy with choledocostomy	40
Cholecystostomy with choledocostomy	1
Cystico-choledocostomy	1
Incision and drainage	1

In accompany to the operative mentioned above appendectomy was done in 17 cases and gastrojejunostomy 1, removal of bilaterol ovarian cysts 1 and resection of ribs 1 were done.

In 18 of the cases ether anesthesia was used. Spinal anesthesia with 6% novacaine used in 52 cases, and combined general and spinal anesthesia was used in 1 case.

In 18 cases of choledocostomy T-tube was used to drain the common bile duct, and in 5 cases cigarette drains were used to drain the abdominal cavity.

All the patients stood the operation well except 2 of them had primary shock on table and checked by giving stimulants, and 1 died on table because of cardiac failure.

Cholangiography after cholecystectomy was done in 6 cases 5 showed patent common duct, 1 showed obstruction of common duct. The obstruction was checked by repeated irrigation of the duct through T-tube.

Post operative diagnoses

1. Primary Diagnoses:-

Chronic cholecystitis and cholelithiasis	
with adhesions	38 cases
Chronic cholecystitis and cholelithiasis	
with acute exacerbation	10 "
Acute cholecystitis with cholelithiasis	11 "
Empyema with gall stones	5 "
Hydrops of gall bladder with stones	1 case
Cholelithiasis with biliary fistula	3 cases
choledocalithiasis with suppurative	
cholangitis	3 "

2. Secondary diagnoses:-

Chronic appendicitis	11 "
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Obstruction of common duct

with jaundice

and ileus with exhaustive

rush due to sulfa drug

Intraabdominal abscess

Local peritonitis

Pleurisy with effusion

Reaction to blood transfusion

Bacillary dysentery

Extrasystole

Shock

1 "

1 "

1 "

1 "

1 "

Duration of fever after operation

Less than 1 week

45 cases

Less than 1-2 weeks

18 "

Less than 2-4 weeks

5 "

Less than 4-5 weeks

3 "

Percentage of cure

64 patients had complete cure (90.1%).

1 patient had recurrence 4 months later with epigastric pain, fever, jaundice and tenderness around the scar of incision wound. Diagnosis was recurrence of stone in common duct. Since patient refused operation only conservative treatment was given with partial relief of symptoms.

6 patients died with postoperative complications:

(8.5%)

Pneumonia

2 cases

day after operation)

east

ileus with exhaustion

al failure and perito.

(died on tabl

Extensive destruction of

a portal thro.

Other laboratory findings

When the fat, fertility, and biliary tract. Classical gallstones are about equally distributed in both of the patients are not well noted. Age incidence highest from 20 to 40. Only 4.4% of our series is multiple. Eight per-centage had a previous gastro-intestinal diseases and 1.9% had foci of infection. Forty per-centage of the 45 cases in which culture of bile was done showed B. coli growth.

2. Multiple stones were more common than single stones found in our series, and the most common location of the stones were in the common duct, next common in the gall bladder. Intrapancreatic stones were found in 1 case.

3. In all cases inflammatory processes of the gall bladder or the bile ducts were found, either chronic, subacute or acute. Anatomical anomaly was very rare. Rupture of the gall bladder and biliary fistulas were of rather low incidence.

4. Most of the patients had a long history of active symptoms. Eighty three point one per cent of the cases had actual colicky attacks. Sixty two point seven per cent had history of jaundice. Forty-seven point nine per cent had positive, Murphy's sign.

5. More than half of the patients had some fever and most of them had leucocytosis ranging from 10,000 to 35,000. Three fourth of them showed elevated icteric index and about half of them had increased

Other laboratory findi

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Other laboratory findings

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