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THE FACTORS INVOLVED IN POSTCHOLECYSTECTOMY STATES

Review of 130 Cholecystectomies

Harris Breiner Graves

Submitted in Partial Fulfillment for
The Degree of Doctor of Medicine

College of Medicine, University of Nebraska

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TABLE OF CONTENTS

Introduction---------------------------------------1
Postcholecystectomy Syndrome Concepts------------ 2
Classification of Causes------------------------- 8
Differential Diagnosis----------------------------11
Method of Follow-up-------------------------------28
Statistics--31-46
    Results from Questionnaire--------------------32
    General Information---------------------------35
    Acute Attacks---------------------------------37
    Roentgenography-------------------------------39
    Surgical Findings-----------------------------40
    Pathological Findings-------------------------41
    Mortality-------------------------------------43
Correlated Statistics-----------------------------46-53
    Role of Typical Attacks-----------------------47
    Digestive Disturbances------------------------49
    Duration of Present Illness-------------------50
    Pathology reports-----------------------------51
    Post-operative Drainage-----------------------52
Review of Patients--------------------------------53
Clinical Follow-up Procedures---------------------62
Summary---64
Conclusions---------------------------------------66
Acknowledgments-----------------------------------67
Bibliography

INTRODUCTION

CHOLECYSTECTOMY IS DEFINED AS "THE SURGICAL REMOVAL OF THE GALLBLADDER" BUT THIS SIMPLE DEFINITION DOES NOT INCLUDE THE IMPLICATIONS, THE DANGERS AND THE FAILURES OF SUCH AN OPERATION. MANY SURVEYS OF THE RESULTS OF CHOLECYSTECTOMY HAVE SHOWN FAILURES OF CURE IN FROM 15 PERCENT TO 70 PERCENT OF CASES. MACDONALD (1943) SHOWED POOR RESULTS OF FROM 15 TO 35 PERCENT WHILE PRIBRAM (1950) FOUND FAILURE OF CURE FROM CHOLECYSTECTOMY IN 20 PERCENT OF HIS CASES. IN ANOTHER INSTANCE, BROWN (1934) REPORTED A SUMMARY OF RESULTS OBTAINED BY SURGERY IN EIGHTY-FOUR PATIENTS FROM THE GASTRO-INTESTINAL CLINIC OF THE JOHNS HOPKINS HOSPITAL AND FOUND "COMPLETE OR RELATIVE CURE OR RELIEF OF SYMPTOMS" IN 59 PERCENT AND CONSIDERED 41 PERCENT "UNSUCCESSFUL". HE CONCLUDED: "I FOR ONE, THEREFORE, CANNOT FEEL THAT SURGERY SHOULD BE INDISCRIMINATELY ADVISED FOR ALL CASES OF GALLBLADDER PATHOLOGY. IT HAS A DEFINITE MORTALITY; IT HAS A CONSIDERABLE PROPORTION OF FAILURES; IT HAS MANY POSTOPERATIVE POSSIBILITIES WHICH MAKE THE SECOND STATE OF THE PATIENT THE SAME AS, OR EVEN WORSE THAN, THE FIRST."

IN AGREEMENT WITH BROWN'S STATEMENT, DR. HERBERT

Davis, Dr. Wesley Soland and the writer undertook the task of reviewing the cases of cholecystectomy at the University Hospital, University of Nebraska College of Medicine, in an attempt to determine the reasons for the high incidence of the so-called "postcholecystectomy syndrome" and the manner in which this incidence might be lowered. This paper is the first part of the survey and concerns itself with a review of the hospital charts and the subjective results of answers to a questionnaire mailed to each patient. The second part of the survey, that of re-examination, re-evaluation and treatment of those patients exhibiting the postcholecystectomy syndrome must necessarily be delayed beyond the date of this writing.

POSTCHOLECYSTECTOMY SYNDROME CONCEPTS

The functions of the gallbladder, according to Ivy and Goldman (1939), are two. First, they mention the function of pressure regulation; in this capacity the organ serves as a reservoir to prevent back pressure on the liver in its continuous production of bile. This is a simple hydrostatic necessity since the outlet

INTO THE INTESTINE MAINTAINS A RESISTANCE OF 9 TO 25 CM. OF BILE AT THE SPHINCTER OF ODDI.

THE SECOND FUNCTION OF THE GALLBLADDER IS THAT OF BILE STORAGE, A FUNCTION ENHANCED BY THE ABILITY OF THE STRUCTURE TO CONCENTRATE BILE. IN THE HUMAN GALLBLADDER, BILE IS CONCENTRATED FROM ONE-FIFTH TO ONE-TENTH OF ITS HEPATIC CONCENTRATION, AND THUS STORAGE OF BILE PRODUCED OVER A PERIOD OF FROM TWELVE TO TWENTY-FOUR HOURS IS POSSIBLE.

THE FUNCTIONS OF BILE, ACCORDING TO COWGILL (1941), ARE PRIMARILY THREE: (1) THAT OF AIDING IN DIGESTIVE PROCESSES, (2) THAT OF AIDING IN THE CONTROL OF INTESTINAL PUTREFACTION AND (3) AS AN EXCRETORY MEDIUM.

IN THE PROCESSES OF DIGESTION, BILE FUNCTIONS BOTH AS AN AID TO THE FAT-SPLITTING ENZYME, LIPASE, AND ALSO IN THE ABSORPTION OF FATTY ACIDS AND FAT SOLUBLE VITAMINS, PARTICULARLY VITAMIN K, FROM THE INTESTINAL TRACT. COWGILL IS OF THE OPINION THAT BILE ASSISTS LIPASE THROUGH ITS PROPERTY OF LOWERING SURFACE TENSION. BILE ALSO AIDS THE ACTIVITY OF TRYPSIN AND PANCREATIC AMYLASE, PROBABLY BECAUSE OF ITS ALKALI CONTENT.

BILE IS A FACTOR IN THE CONTROL OF INTESTINAL PUT-

REFACTION BUT NOT BECAUSE OF ANY ANTISEPTIC ACTION SINCE CERTAIN BACTERIA CAN BE CULTURED ON A BILE MEDIUM. THIS EFFECT IS THOUGHT TO BE ACCOMPLISHED THROUGH ITS MILD LAXATIVE ACTION AND THUS EXPULSION OF THE INTESTINAL CONTENTS IS ENCOURAGED BEFORE EXCESSIVE PUTREFACTION OCCURS.

BILE ALSO ACTS AS AN EXCRETORY MEDIUM. IT IS THE ONLY BODY FLUID WHICH DISSOLVES CHOLESTEROL APPRECIABLY, AND MANY TOXINS, METALLIC POISONS AND METABOLITES LEAVE THE BODY BY WAY OF THE BILIARY PASSAGES.

THE FAMILIAR SYNDROME OF SYMPTOMS WHICH OFTEN APPEARS FOLLOWING REMOVAL OF THE GALLBLADDER IS DEFINED BY DAVISON (1947) AS "A RECURRENCE OF SYMPTOMS FOLLOWING REMOVAL OF THE GALL BLADDER RESEMBLING OR IDENTICAL TO THOSE WHICH EXISTED PRIOR TO OPERATION." OTHER WRITERS DO NOT ENTIRELY AGREE.

PRIBRAM (1950) IN HIS ARTICLE ON POSTCHOLECYSTECTOMY SYNDROMES STATES THAT THE TERM "POSTCHOLECYSTECTOMY SNYDROME" SHOULD BE RESERVED FOR GROUPS OF CLINICAL SNYDROMES ATTRIBUTED DIRECTLY OR INDIRECTLY TO MISSING FUNCTIONS OF THE GALLBLADDER. HE LISTS THE FUNCTIONS OF THE GALLBLADDER AS:

A. CHOLOKINESIS (EXPULSION OF BILE)

1. Regulation of bile pressure, with absence of function resulting in pressure syndromes, cramps in the right upper quadrant, nausea, etc.

2. Neuro-regulation of the gallbladder. He believes that spasm of the sphincter results in pressure syndromes and biliary stasis with consequent cholangiohepatitis or pancreatitis while paralysis of the sphincter results in diarrhea and enteritis from the constant dribbling of bile into the duodenum.

B. Biochemical properties of the concentrated gallbladder bile.

1. Digestion of food. Pribram believes that not only is the concentrated gallbladder bile no longer present but that there is also lost the substance elaborated by the gallbladder wall, cholecysmon, with a resulting decreased tolerance for food, especially fat, anorexia and flatulence.

Other authors include under the term "postchole-

CYSTECTOMY SYNDROME" A MORE COMPREHENSIVE GROUPING. NICKEN, WHITE, AND CORAY (1947) SAY THAT THE SYNDROME IS DUE TO ONE OF THREE CAUSES: (1) INCORRECT PRE-OPERATIVE DIAGNOSIS, (2) RESIDUAL HEPATIC DISEASE OR (3) INCOMPLETE SURGERY. THEY BELIEVE THAT INCOMPLETE REMOVAL OF THE CYSTIC DUCT IS A FACTOR IN PRODUCING POSTCHOLECYSTECTOMY COMPLICATIONS AND THAT TRACTION KINKING OF THE COMMON HEPATIC DUCT IS DUE TO THE ATTACHMENT OF THE RAW END OF A LONG CYSTIC DUCT TO THE VENTRAL SURFACE OF THE LIVER, COLON OR DUODENUM.

GRAY AND SHARPE (1944), ON THE OTHER HAND, BELIEVE THAT THE CYSTIC DUCT STUMP IS CAPABLE OF STONE FORMATION AND MAY, IN PART, TAKE OVER SOME OF THE FUNCTIONS OF THE ABSENT GALLBLADDER AND CONSIDER THE CYSTIC DUCT STUMP AS ONE OF THE CAUSES OF THE SYNDROME. THEY LIST OTHER CAUSES AS: (1) ERRONEOUS DIAGNOSIS, (2) ILL ADVISED OPERATION, (3) STRICTURE OF THE EXTRAHEPATIC BILE DUCTS, (4) RESIDUAL STONES OR PUTTY-LIKE MATERIAL, (5) MALFUNCTION OF THE SYMPATHETIC OR PARASYMPATHETIC NERVOUS SYSTEMS, (6) POST-OPERATIVE ADHESIONS WITH ANGULATION OF THE DUODENUM TO THE GALLBLADDER FOSSA.

IT WOULD SEEM THAT COLP (1944) OVER-SIMPLIFIES THE

cause of the syndrome when he says that the chief factors in the production of such a state is the presence of reflex incoordination with resulting spasm of the sphincter mechanism at the orifice of the common duct. He feels that both the muscle of the sphincter of Oddi itself and the adjacent duodenal smooth muscle are involved in the condition.

Macdonald (1943) covers more of the causes by dividing the snydrome into minor and major complaints. Under minor complaints he lists the temporary or non-operative causes of discomfort or pain such as sphincter spasm, pylorospasm, blood, mucous or debris in the ductal system, liver or gut trauma, and a T-tube producing common duct irritation or obstruction. He considers the causes of major complaints to be: (1) Wrong diagnosis, (2) Residual disease, (3) calculi in the common duct, (4) Common duct stricture, (5) Partial or intermittant obstruction of the common duct or duodenum, (6) Functional disturbances, (7) Lack of, or indifference to, medical treatment, (8) Traumatic neuroma in the wound, and (9) Malignancy.

CLASSIFICATION OF CAUSES OF SYMPTOMS FOLLOWING CHOLECYSTECTOMY

In the study of causes of symptoms following cholecystectomy we have found the following classification helpful in placing these patients in categories both before and after they have been worked up in the clinic or in the hospital itself.

I. ERROR IN DIAGNOSIS

- Primary hepatitis
- Peptic ulcer
- Hepatic cirrhosis
- Appendicitis
- Gastrointestinal allergies
- Carcinoma of the abdominal viscera
- Pancreatitis
- Coronary heart disease
- Others

II. ERROR IN TECHNIQUE

A. Residual Disease
  - Cystic Duct Stump
    - With Stones
    - Without Stones
  - Common and Hepatic Duct Stones

B. Traumatic
  - Division
  - Stricture
    - Blind clamping
    - Ligation
    - Traumatic dissection
  - Incisional hernia

III. PATIENT'S DISEASE

A. Neurological

Neuromas
- Cystic and common duct area
- In operative wound

Biliary dyskinesia

B. Pancreatic reflux

C. Adhesions
- Traction kinking of adherent cystic duct stump to colon, liver or duodenum
- Duodenal obstruction due to adherence to nonperitonized gallbladder fossa

D. Residual disease (not cured by cholecystectomy)
- Cholangitis
- Cirrhosis
- Functional (anxiety state, lack of, or indifference to, medical management, etc.)
- Achlorhydria

E. Absence of gallbladder functions

F. Foreign bodies.

The causes have been classified in such a way that groups I and II (Error in diagnosis and error in technique) are considered to be largely preventable, while group III (Patient's disease) is considered to be non-preventable as far as the cholecystectomy itself is concerned.

The study of gallbladder disease and the results obtained from the removal of such a diseased organ are

NECESSARILY CLOSELY ALLIED TO THE PROPER DIAGNOSIS OF SUCH A CONDITION. INDEED, ONE OF THE MAJOR REASONS FOR FAILURE OF THE REMOVAL OF THE DISEASED GALLBLADDER TO ACCOMPLISH THE DESIRED RESULTS AND RENDER THE PATIENT ASYMPTOMATIC IS EITHER THE FAULTY DIAGNOSIS OF THE PATHOLOGY INVOLVED IN THE BILIARY TRACT OR THE FAILURE TO RECOGNIZE DISEASE IN OTHER AREAS OF THE BODY WHICH MAY SIMULATE GALLBLADDER DISEASE. IT IS NECESSARY, THEN, TO BE COGNIZANT OF OTHER PATHOLOGY WHICH, FOLLOWING REMOVAL OF THE GALLBLADDER MAY GIVE RISE, IN PART AT LEAST, TO THE SO-CALLED "POSTCHOLECYSTECTOMY SYNDROME," OR WHICH MAY EVEN ENDANGER THE LIFE OF A PATIENT UNDERGOING SURGERY.

IT IS NOT THE IDEA OF THIS PAPER TO COVER FULLY EACH DISEASE AND ITS DIAGNOSTIC POINTS BUT MERELY TO PRESENT A WORKABLE TRAIN OF THOUGHT WHEN CONSIDERING ONE OF THE MAIN SYMPTOMS OF GALLBLADDER DISEASE--PAIN IN THE RIGHT HYPOCHRONDRIUM. IN ORDER TO DO THIS, IT WAS FELT THAT THOSE DISEASES IN A GIVEN AREA MIGHT BE GROUPED TOGETHER IN SUCH A WAY THAT A DIAGNOSIS MIGHT BE REACHED BY CONSIDERATION OF THE DIFFERENT AREAS OF THE BODY WHICH MAY CAUSE PAIN IN THE RIGHT UPPER QUADRANT.

I. Gallbladder and Associated Ducts

1. Acute Cholecystitis

The diagnosis of acute cholecystitis is mainly determined by presence or absence of a stone obstructing the cystic duct. In the simple, or unobstructed, type the attacks frequently pass as acute indigestion or biliousness with an onset which is gradual and consisting of relatively minor symptoms such as nausea, anorexia, shivering and slight fever followed by indefinite aching pains in the epigastrium and right upper quadrant. Definite tenderness and rigidity of the right rectus muscle and pain slowly increase but does not usually require morphine for relief. The attack usually subsides under medical treatment. In the acute obstructed type there are sudden attacks of typical biliary colic which changes to acute stabbing epigastric agony localized in the right subcostal area and is increased by the slightest movement of the diaphragm. Vomiting and

CONSTIPATION ALMOST ALWAYS OCCUR AND CHILLS MAY BE SEVERE BUT THE TEMPERATURE RARELY IS OVER 101' TO 102'. THERE IS A MODERATE LEUCOCYTOSIS BUT IN 50 PERCENT OF THE CASES THIS IS NOT OVER 10,000. JAUNDICE USUALLY INDICATES INVOLVEMENT OF THE DUCTS AND IS RARE IN UNCOMPLICATED CASES. THERE IS A PALPABLE MASS IN THE RIGHT UPPER QUADRANT IN 20 PERCENT OF THE CASES. THE HISTORY OF TYPHOID FEVER OR REPEATED ATTACKS OF COLIC IS HELPFUL.

2. CHRONIC CHOLECYSTITIS

THE MOST CHARACTERISTIC SYMPTOM IS THAT OF RECURRING ATTACKS OF BILIARY COLIC. SUDDEN PAIN IN THE EPIGASTRIUM OR RIGHT UPPER QUADRANT TRAVERSING AROUND THE RIGHT COSTAL BORDER TO THE RIGHT SUBSCAPULAR AREA IS TYPICAL AND OFTEN REQUIRES MORPHINE FOR RELIEF. THERE IS FREQUENT NAUSEA AND VOMITING AT THE ONSET AND RESIDUAL SORENESS OVER THE GALLBLADDER AREA MAY LAST FOR DAYS. THE TEMPERATURE IS USUALLY NORMAL OR BELOW DURING

THE PAROXYSMS BUT THE PULSE IS ELEVATED. THERE IS OFTEN A DULL ACHING SORENESS UNDER THE RIGHT COSTAL BORDER WHICH IS MADE WORSE BY JARRING OR JOLTING OR BY EATING A FULL MEAL. THERE MAY ONLY BE A FEELING OF FULLNESS. DIGESTIVE DISTURBANCES ARE VERY COMMON IN MOST CHRONICCASES AND INCLUDES EPIGASTRIC FULLNESS AFTER MEALS, BLOATING AND GASEOUS ERUCTATIONS. JAUNDICE IS NOT COMMON IF ONLY THE GALLBLADDER IS INVOLVED BUT A TRANSIENT TYPE MAY BE DUE TO ASSOCIATED HEPATITIS OR CHOLANGITIS.

3. CHOLELITHIASIS

THE SYMPTOMS OF GALLSTONES ARE DEPENDENT IN CONSIDERABLE MEASURE UPON THEIR LOCATION. STONES IN THE GALLBLADDER PROBABLY PRODUCE SYMPTOMS BY VIRTUE OF PRESSURE OR IRRITATION OF THE WALL OF THE VISCUS. VAGUE SENSATIONS OF FULLNESS, DULL DISTRESS IN THE EPIGASTRIUM OR RIGHT UPPER QUADRANT, ESPECIALLY AFTER EATING, ALSO PYROSIS, SOUR ERUCTATIONS, AND FLATULENCE ARE VERY SUGGESTIVE OF GALLSTONES.

In typical biliary colic, the attacks are usually abrupt in onset often commencing several hours after a heavy meal, and as a consequence, most often occurring in the evening or during the night. In general the attacks are of a severe nature, causing the patient to writhe, roll, or double up, to walk about in anguish, or to shout or cry because of acute distress. The pain is located in the right upper quadrant of the abdomen, at times somewhat near the mid-line. From the site of onset it radiates through to the back, usually beneath the right scapula, and sometimes to the right shoulder. The duration of the attack is variable, rarely more than several hours, often less. Vomiting is usual and in many instances brings some degree of relief.

4. Choledocholithiasis

Pain is produced when the stone or stones first enter the duct, following which there is stretching and smooth muscle spasm in an

ATTEMPT TO EXPEL THE STONE. AS THE DUCT DILATES, COLIC MAY DISAPPEAR UNTIL SUCH TIME AS A STONE ENTERS THE AMPULLA OF VATER, WHEN SMOOTH MUSCLE CONTRACTION AGAIN PRODUCES PAIN WHICH IS OFTEN INTERMITTANT AS THE STONE MOVES UP AND DOWN IN THE LOWER END OF THE DUCT. A BALL-VALVE ACTION OF THIS TYPE USUALLY RESULTS IN JAUNDICE OF FLUCTUATING INTENSITY, AND IS OFTEN PRODUCTIVE OF SUPPURATIVE CHOLANGITIS WITH CHILLS AND FEVER.

5. CARCINOMA OF THE GALLBLADDER

MOST OF THE CASES HAVE HAD PREVIOUS SYMPTOMS OF GALLSTONES OR CHOLECYSTITIS. CARCINOMA OF THE FUNDUS OF THE GALLBLADDER PRODUCES DULL CONSTANT PAIN AND OFTEN TENDERNESS, WEAKNESS AND LOSS OF WEIGHT, AND A HARD, NODULAR MASS IN THE REGION OF THE GALLBLADDER. JAUNDICE IS USUALLY PRESENT BUT MAY APPEAR RELATIVELY LATE. ONCE ESTABLISHED, IT DEEPENS PROGRESSIVELY, AND COMPLETE BILIARY OBSTRUCTION USUALLY OCCURS.

6. CARCINOMA OF THE AMPULLA OF VATER

CHARACTERIZED MAINLY BY BILIARY OBSTRUCTION

and jaundice.

II. Diseases of the Liver

1. Acute Hepatitis (Infectious)

In typical infectious hepatitis there is usually a symptomless incubation period of 20 to 120 days, depending upon the type of in-infection and somewhat on the mode of trans-mission. The prodromal or pre-icteric stage may be abrupt or gradual in onset. It is usually marked by an elevation of temperature between 100 and 103 degrees and is character-ized by the following symptoms, arranged roughly in order of frequency: anorexia, which is a most important feature in differential diagnosis, general malaise, fatigability, headache, chilly sensations, nausea, vomiting, pruritus, light stools, upper right quadrant distress, constipation, and diarrhea. The liver may be somewhat enlarged and tender, especially to a jarring blow over the lower ribs. During the icteric stage the right upper abdominal pain may be of such severity that a

mistaken diagnosis of cholecystitis or other surgical conditions is made. The jaundice deepens rapidly, reaching a maximum within a week and then fades gradually.

2. Hypertrophic Cirrhosis (Alcoholic)

Cirrhosis may provoke few symptoms. Usually the patient gives a story of chronic alcoholism and malnutrition. Signs of failure of the liver are readily apparent. The patient is weak and mentally dull or confused. He complains of thirst and abdominal discomfort or pain. There is often a low-grade fever. The skin is dry, inelastic, and the body hair may be scanty. There is usually little trouble differentiating the pain in this condition from that of cholecystitis.

3. Obstructive Biliary Cirrhosis

This form of biliary cirrhosis is seen more often in women than in men. The average age at onset is about fifty years. In most instances there is a history of partial or intermittent obstruction for several years, associated with febrile episodes and occasion-

ally chills. Anorexia and abdominal distention are frequent symptoms. The patient becomes increasingly weak, emaciated, and listless.

4. Abscess of the Liver

   Extreme weakness, wasting, spiking fever with chills, sweats, nausea and vomiting, and abdominal distention are usual. The liver is almost always enlarged, painful and tender. A mild degree of jaundice is seen in about fifty percent of the cases. Leucocytosis is usually pronounced.

5. Carcinoma of the Liver

   A rare condition in the United States. Symptoms of primary carcinoma may be indistinguishable from symptoms of the cirrhosis which usually is also present. Weakness, loss of weight, gastro-intestinal disturbances, ascites, jaundice, abdominal pain, fever and peripheral edema are characteristic of both diseases but are not invariably present. Persistent dull pain in the region of the liver, radiat-

ing towards the back is said to be more typical of carcinoma than of cirrhosis.

III. Diseases of the Pancreas

1. Carcinoma of the Pancreas

In carcinoma of the body, pain is the most common and severe symptom because of the involvement of the fibers of the celiac plexus and obstruction of the main pancreatic duct. The pain is usually of a deep, boring, fairly constant character radiating through to the lower thoracic or interscapular region. When the lesion originates in the head of the organ and extends to the ampullar region with blockage of the common bile duct, the dominant symptom and sign of steadily increasing jaundice appears and with it increasing itching of the skin. Often there is the severe pain mentioned above.

2. Acute Pancreatitis

The onset is usually sudden with acute excruciating pain in the epigastrium or upper abdomen and at times in the left costoverteb-

ral angle.

IV. Diseases of the Gastro-intestinal Tract

1. Acute Appendicitis

In acute appendicitis pain is almost without exception the first symptom. It most frequently comes on suddenly and is at first paroxysmal in character. The first pain may develop around the umbilicus or in the epigastrium and later localize in the right iliac fossa. A high-lying cecum and appendix may be confused with cholecystitis but with appendicitis there is no referal of the pain to the back. There is usually nausea and vomiting and nearly constantly some fever of between 99 and 103 degrees. There is leucocytosis but a count of over 20,000 should raise a question of diagnosis or suggest perforation. Rigidity is frequently present in varying degrees.

2. Peptic Ulcer

Pain is the outstanding symptom of ulcer, the four characteristics being its chronicity, its

periodicity, its quality, and its relationship to food taking. The chronicity of the disease is indicated by the fact that the average stated duration of the distress is six or seven years. The pains usually have highest incidence in the fall and spring months. It is, as a rule, a gnawing or aching sensation; sometimes it is described as burning, hurting, annoying or cramplike, or as hunger. It is almost invariably epigastric but the pain may radiate around the costal border or through to the back or to the right lower quadrant. In duodenal ulcer the distress is likely to be located in the right epigastrium and in gastric ulcer in the left epigastrium.

3. Gastric Carcinoma

The symptoms of cancer of the stomach are most indefinite; almost any indigestion in any individual of cancer age is suspicious. The abdominal distress consists of fulness or discomfort induced by eating, or of gnawing or

ACHING EPIGASTRIC PAIN WHICH MAY APPEAR AT ANY TIME AFTER EATING, WHICH NOT INFREQUENTLY IS RELIEVED BY EATING, AND USUALLY IS RELIEVED BY INDUCED OR SPONTANEOUS VOMITING. HEMATEMESIS, MELENA AND ANEMIA MAY OCCUR.

4. GASTRO-INTESTINAL ALLERGIES

THERE IS USUALLY PRESENT SOME TYPE OF HISTORY OF ALLERGY SUCH AS HAY FEVER, ASTHMA, HIVES.

V. DISEASES OF THE KIDNEYS

1. NEPHROLITHIASIS

THE MOST COMMON SYMPTOM IS INTERMITTANT DULL PAIN IN THE FLANK OR BACK, INTENSIFIED BY MOTION OR A SUDDEN JOLT. THE PAIN IS OF EXCRUCIATING SEVERITY, BEGINS IN THE BACK OR FLANK, AND RADIATES FIRST ACROSS THE ABDOMEN AND THEN DOWN ALONG THE COURSE OF THE URETER TO THE GENITALIA AND INNER ASPECT OF THE THIGH. THE PAIN IS FREQUENTLY SUFFICIENTLY SEVERE TO INDUCE NAUSEA, VOMITING, PROFUSE SWEATING, FAINTNESS, AND SHOCK. ABNORMALITIES OF THE URINE OCCUR AT ONE TIME OR ANOTHER IN EIGHTY

percent of the cases.

2. Pyelitis and Pyelonephritis

In the so-called typical attack, the onset is sudden, or may follow a few days of malaise with chill, fever, headache, prostration, pain in the loin which may radiate along the course of the ureter and leukocytosis as high as 20,000 or higher. The urine contains bacteria, albumin and varying amounts of pus.

3. Tuberculosis of the Kidney

4. Kidney Tumor

The three cardinal symptoms of renal neoplasms are hematuria, pain, and the presence of a tumor mass in the loin. Hematuria is the most constant and outstanding symptom of tumor of the kidney. Pain, occurring in sixty percent of cases, is frequently inconstant and vague, but may be colicky due to passage of blood clots, or dull and aching as a result of distention of the pelvis or capsule.

5. Deitl's Crisis

VI. Diseases of the Heart

1. Congestive Heart Failure

The primary disease (heart failure) dominates the clinical picture. Frequently there are no symptoms attributable to the liver itself or merely a sense of heaviness in the right hypochondrium. The patient rarely has sharp pains that simulate gallbladder colic.

2. Angina Pectoris

The anginal syndrome is characterized chiefly by recurrent attacks of substernal pain. The latter is less frequently epigastric or precordial. It may run the gamut from a slight sense of heaviness in the chest to a severe, viselike, crushing pain. There is a tendency for the pain to radiate, most frequently to the left shoulder and arm and occasionally to the fingers. Less frequently it may radiate to neck, jaw and teeth, to the back, upper abdomen, or even to the right shoulder.

VII. Diseases of the Lungs

1. Pneumonia.

The cardinal symptoms of pneumonia are chills,

FEVER, PAIN IN THE CHEST, COUGH, AND THE EXPECTORATION OF RUSTY SPUTUM. PAIN IN THE CHEST IS ALSO A VERY COMMON SYMPTOM, USUALLY APPEARING SHORTLY AFTER THE CHILL. IN SOME CASES, IT PRECEDES THE CHILL, AND IN OTHERS THE CHILL IS ABSENT AND THE DISEASE IS USHERED IN BY THE PAIN IN THE SIDE. THIS IS USUALLY LOCATED IN THE REGION OF THE NIPPLE, OR AT THE BASE OF THE AFFECTED LUNG, BUT IN SOME CASES IT IS REFERRED TO THE ABDOMEN AND IS ACCOMPANIED BY TENDERNESS SUGGESTIVE OF APPENDICITIS, CHOLECYSTITIS, OR PERITONITIS. IN UPPER LOBE INFECTIONS PAIN MAY BE ABSENT OR REFERRED TO THE SHOULDER.

2. PLEURISY

VIII. DISEASES OF THE DIAPHRAGM

1. SUBPHRENIC ABSCESS

THE MOST IMPORTANT LOCALIZING SYMPTOM IS PAIN, CHARACTERISTICALLY LOCATED IN THE CHEST OVER THE LOWERMOST RIBS. DEPENDING ON THE LOCATION OF THE ABSCESS THE PAIN MAY BE ANTERIOR, POSTERIOR, OR LATERAL. THE MOST TYPICAL PHYSICAL SIGNS OCCUR IN RIGHT-SIDED ABSCESS IN WHICH

THE LIVER IS PUSHED DOWN AND THE HEMIDIAPHRAGM IS PUSHED UP. THE LIVER, THOUGH PALPABLE, IS NOT TENDER UNLESS IT IS ITSELF THE SITE OF AN ABSCESS. LOCAL TENDERNESS IS COMMONLY PRESENT.

2. DIAPHRAGMATIC PLEURISY

PAIN IS THE PRINCIPAL SYMPTOM OF DIAPHRAGMATIC IRRITATION. IT IS CHARACTERISTICALLY RELATED TO INSPIRATION. WHEN THE SOURCE OF IRRITATION IS NOT CENTRALLY LOCALIZED THE PAIN IS REFERRED ALSO TO THE LOWER PART OF THE CHEST AND, NOT INFREQUENTLY, TO THE EPIGASTRIUM AND HYPOGASTRIUM.

3. DIAPHRAGMATIC HERNIA

MAY SIMULATE ANY NUMBER OF CONDITIONS.

IT HAS BEEN CLAIMED BY MANY AUTHORS THAT THE CYSTIC DUCT STUMP WHICH IS LEFT BY SO MANY OPERATORS IN DOING A CHOLECYSTECTOMY MAY BE ONE OF THE REASONS FOR POST-CHOLECYSTECTOMY SYMPTOMS AND IS THEREFORE INCLUDED IN OUR CLASSIFICATION AS AN ERROR IN TECHNIQUE AND, AS SUCH, SHOULD BE A PREVENTABLE CAUSE. MORTON (1948)

TELLS OF SEVEN PATIENTS WITH A CYSTIC DUCT STUMP IN WHICH SYMPTOMS APPEARED "AT ONCE" TO FIFTEEN YEARS FOLLOWING THE ORIGINAL CHOLECYSTECTOMY. THE INDICATIONS FOR THE PREVIOUS GALLBLADDER SURGERY HAD BEEN ADEQUATE AND ALL CASES HAD BOTH PAIN AND JAUNDICE. HIS RESULTS FOLLOWING REMOVAL OF THE STUMP WERE "EXCELLENT" OVER A FOLLOW-UP PERIOD OF FROM ONE TO SEVEN YEARS.

MORTON BELIEVES THE REASON FOR SYMPTOMS FROM THE CYSTIC DUCT REMNANT TO BE: DILATATION OF THE REMNANT AND THE REFORMATION OF A GALLBLADDER-LIKE DIVERTICULUM; THE CHOLEDOCHODUODENAL MECHANISM OF RECIPROCAL INNERVATION; NEUROMA-LIKE SCARRING OF THE REMNANT; AND FOCUS OF INFECTION IN THE REMNANT.

BILIARY DYSKINESIA IS PLACED IN OUR CLASSIFICATION AS ONE OF THE NON-PREVENTABLE CAUSES OF POSTCHOLECYSTECTOMY SYMPTOMS AND IS NOT USED, AS HAS BEEN DONE BY SOME WRITERS, TO DESCRIBE THE ENTIRE SYNDROME. HILL (1937) IN HIS ARTICLE ON BILIARY DYSKINESIA (DYSSYNERGIA) STATES THAT THE SYMPTOMS OF SPASTIC DISORDERS OF THE EXTRA-HEPATIC BILIARY TREE ARE SIMILAR TO THOSE OF A CASE OF MILD GALLBLADDER COLIC, WHILE A CASE OF GASTRO-INTESTINAL DYSPEPSIA IS SIMULATED IN THE ATONIC FORMS

of dysfunctioning.

The symptomatology of biliary dyskinesia as observed by Westphal (1923) and Newman (1933) consists of: (1) dull pain, either aching in character or similar to mild gallstone colic, appearing soon after eating and localized in the epigastrium or the back, (2) nausea with occasional vomiting, (3) bowel disturbances with diarrhea (atonic) or constipation (tonic) and (4) tenderness over the gallbladder area.

Absence of gallbladder functions is naturally a non-preventable condition arising after cholecystectomy. The manifestations of the missing functions are described by Pribram (1950) and have already been related.

Thorek (1951) reports cases of biliary duct obstruction due to deposits of salts around foreign bodies and this, too, has been placed in the non-preventable classification.

METHOD OF FOLLOW-UP

In order that we might determine which of the cholecystectomized patients were still having difficulty it was decided to prepare a questionnaire which would

be mailed to each such patient and a self-addressed, stamped envelope was included to insure better results. The questions were such that most of the symptoms which follow cholecystectomy were included. It was also attempted to word the questions in such a way that little confusion would result.

A sample of the questionnaire is given below:

Have you had any recurrence of pain in the abdomen?___
Where was the pain located?___
Was it similar to the pain previous to surgery?___
If so, was it as severe?___
If not, how was it different?___
By what was the pain caused or made worse?___
By what was the pain relieved?___
Is the pain still present?___
Is your appetite as good or better than before surgery?
Have you noticed any food that disagrees with you?_
What kind of food?___
Have you gained or lost any weight since operation?
If so, how much?___
Have you been bothered by diarrhea since operation?
Have you noticed any abnormal color of the bowel movement?___Light___Dark___Black___Bloody___
Is your urine ever dark brown in color?___
Have you had any yellow jaundice since surgery?___
Noticed recently___How first noticed___
Have you had any other operations since the gallbladder operation?___
If so, when?___
For what?___
Have you had any other serious illnesses since surgery?
What?___
When?___
Have you visited your doctor since your operation?___
For what reason?___
What treatment did you receive?___

WHAT IS YOUR PRESENT: HEIGHT____WEIGHT____AGE________
DO YOU NOW CONSIDER YOURSELF: WELL_____IMPROVED_________
UNCHANGED_____WORSE___(EXPLAIN)______________________
DO YOU NEED ANY FURTHER TREATMENT FOR THIS CONDITION?

THESE QUESTIONNAIRES WERE SENT TO 311 PATIENTS WHO HAD HAD CHOLECYSTECTOMIES AT THE UNIVERSITY HOSPITAL, UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, IN THE YEARS 1942 THROUGH 1950. AS EACH QUESTIONNAIRE WAS RETURNED TO US THE PATIENT'S HOSPITAL CHART WAS REVIEWED AND CERTAIN FINDINGS PLACED ON A MASTER CHART IN ORDER THAT THE ENTIRE GROUP OF PATIENTS COULD BE SUMMARIZED AT A LATER DATE.

FROM EACH HOSPITAL CHART WAS EXTRACTED THE PATIENT'S NAME, SEX, HOSPITAL NUMBER, AGE (AT THE TIME OF OPERATION AND AT PRESENT) ALONG WITH OTHER PERTINENT INFORMATION. THE PRESENT ILLNESS WAS SUMMARIZED INTO TYPICAL OR ATYPICAL ACUTE ATTACKS WITH GRADATIONS FROM ONE TO FOUR DEPENDING UPON THE SEVERITY AND WHETHER TRUE COLIC WAS PRESENT. THE SAME WAS DONE FOR DIGESTIVE DISTURBANCES.

FOLLOWING THIS THE PRESENCE OF JAUNDICE (HISTORY, LABORATORY OR CLINICAL) WAS TABULATED ALONG WITH ANY CO-EXISTING DISEASES, PERTINENT ELEMENTS OF THE PHYSICAL

EXAMINATION AND THE LABORATORY EXAMINATIONS PERFORMED, INCLUDING GASTRIC ANALYSIS. THE ROENTGEN RESULTS WERE ALSO INCLUDED AND A REMARK WAS MADE OF ANY NERVOUS DISORDER WHICH MAY HAVE BEEN PRESENT.

THE SURGICAL REPORT WAS THEN REVIEWED TABULATING THE SURGICAL FINDINGS AND THE TYPE OF SURGERY PERFORMED AND THE RESULTING PATHOLOGICAL DIAGNOSIS. NOTATIONS WERE ALSO MADE OF THE POST-OPERATIVE COURSE AND OF THE POST-OPERATIVE MEDICATIONS USED WHICH MIGHT BE REFERABLE TO THE BILIARY TRACT. OTHER OPERATIONS OR SERIOUS ILLNESSES WHICH THE PATIENT HAY HAVE HAD IN HIS PAST HISTORY WERE LISTED AS WAS ANY INDICATION OF A HISTORY OF ALLERGY.

OUR RESULTS, THEN, HAVE BEEN DRAWN FROM THE ANSWERS BY THE PATIENTS ON EACH QUESTIONNAIRE AND FROM THE SUMMARIES OF EACH PATIENT'S HOSPITAL CHART.

STATISTICS

OF THE 311 QUESTIONNAIRES SENT TO PATIENTS WHO HAD UNDERGONE CHOLECYSTECTOMY, 142 WERE RETURNED TO US. OF THE 142, TEN WERE UNANSWERED BECAUSE OF THE DEATH OF THE PATIENT IN THE INTERVENING YEARS. TWO OTHER QUESTIONNAIRES, ALTHOUGH ANSWERED BY THE PATIENTS, WERE OF NO VALUE TO THE SURVEY BECAUSE THE HOSPITAL CHARTS WERE

unavailable. This leaves a total of 130 patients in the survey.

It may be argued that our statistics are not accurate because, for one reason or another, the patients returning questionnaires may not represent a true cross section of the entire group. This was considered by us but the correlation of the ratio of sexes returning answers to the ratio of sexes in the entire series is so close that it was felt the statistics could represent the entire group.

Of the 311 patients sent questionnaires, forty-eight, or 15.4 percent were male while of the 130 questionnaires concerned in our report seventeen, or thirteen percent belonged to male patients.

Results From Questionnaire

Forty-three and six tenths percent of the patients said that they had had recurrence of pain in the abdomen since their gallbladder operation but only 34.5 percent had recurrence of pain that could be referable to the biliary tract. Of those complaining of recurrence of pain, 21.8 percent said that it was similar to the pain experienced previous to surgery but only 9.8 per-

CENT FELT THAT THE PAIN WAS AS SEVERE AS BEFORE SURGERY.

DIGESTIVE DISTURBANCES SEEMED TO BE THE MOST NUMEROUS COMPLAINT OF THE PATIENTS AND THIS WAS EXPECTED. IN ANSWER TO THE QUESTION, "IS YOUR APPETITE AS GOOD OR BETTER THAN BEFORE THE OPERATION?", 70.4 PERCENT OF THE PATIENTS SAID IT WAS, BUT 57.7 PERCENT ADMITTED CERTAIN FOODS SEEMED TO DISAGREE WITH THEM. IN FACT, 47.8 PERCENT MENTIONED TYPICAL FOODS THAT OCCUR WITH DIGESTIVE DISTURBANCES RELATED TO THE GALLBLADDER. OF THESE FOODS, PERHAPS THE MOST COMMON ONE MENTIONED WAS PORK WITH "FATTY FOODS", PASTRIES AND CABBAGE CLOSE BEHIND. ALSO FREQUENTLY MENTIONED WERE ICE CREAM, CHOCOLATE, SPICES AND COFFEE. AN INTERESTING OBSERVATION WAS THAT, ALTHOUGH A LARGE NUMBER OF PATIENTS COMPLAINED OF FOOD IDIOSYNCRACIES, AN EVEN LARGER NUMBER, 71.5 PERCENT, ADMITTED THEY HAD GAINED WEIGHT SINCE THEIR OPERATION AND MANY SAID THEY HAD GAINED SO MUCH WEIGHT THAT THEY HAD BEEN ADVISED TO DIET BY THEIR FAMILY DOCTORS.

THE MAJORITY OF THE PATIENTS CLASSIFIED THEMSELVES AS "WELL" OR "IMPROVED" WHILE ONLY 4.9 PERCENT SAID THEY WERE UNCHANGED AND ONLY ONE PATIENT FELT THAT SHE WAS WORSE AND BLAMED MOST OF HER COMPLAINTS ON NERVOUSNESS

RESULTING FROM THE SPINAL ANESTHESIA. THIRTY-ONE AND SIX TENTHS PERCENT OF THE PATIENTS CLASSIFIED THEMSELVES AS "WELL" LEAVING A CONSIDERABLE NUMBER WHO WERE "IMPROVED".

IN READING THE QUESTIONNAIRES WE FOUND THAT MANY OF THOSE WHO PUT THEMSELVES IN A CATEGORY OTHER THAN "WELL" HAD DONE SO FOR REASONS OTHER THAN THOSE PERTAINING TO THE GALLBLADDER SURGERY AND THESE WERE THEN DISREGARDED. THE MAJOR COMPLAINTS WHICH BOTHERED THESE PEOPLE WERE HEART, KIDNEY AND ARTHRITIC DIFFICULTIES WHICH COULD NOT BE TRACED TO THEIR PREVIOUS SURGERY.

CAREFULLY REVIEWING THE SUBJECTIVE ANSWERS ON THE QUESTIONNAIRES WE CAME TO THE CONCLUSION THAT TWENTY-NINE PATIENTS WERE EXPERIENCING DIFFICULTIES WHICH COULD BE CLASSIFIED AS "POSTCHOLECYSTECTOMY SYNDROMES". THE REMAINING PATIENTS' COMPLAINTS WERE SUCH THAT THEY COULD NOT BE INCLUDED UNDER THIS CLASSIFICATION BECAUSE THEY WERE: (1) MINIMAL, (2) ENTIRELY DIFFERENT FROM THE COMPLAINTS PREVIOUS TO SURGERY, OR (3) RELATED TO OTHER ORGANS OR SYSTEMS THAN THE BILIARY OR GASTROINTESTINAL TRACTS. EVERY ATTEMPT WAS MADE NOT TO EXCLUDE THOSE PATIENTS WHOSE COMPLAINTS WERE REFERABLE

TO OTHER ORGANS OR SYSTEMS BUT WHO MIGHT HAVE BEEN OPERATED UPON FOR PRESUMED GALLBLADDER DIFFICULTIES DUE TO ERROR IN DIAGNOSIS.

General Information

The average age of the 130 patients involved in this survey was 48.9 years which is slightly older than the ages generally quoted for the typical gallbladder patient. This was the average age at operation and might be expected to be somewhat higher since the patients at the University Hospital are of a lower economic status than the average patient and conceivably might put off the seeking of medical aid. The youngest patient was thirteen years of age but her cholecystectomy was performed during a laparotomy at which time it was determined that she also had biliary cirrhosis. She died at a later date. The youngest patient with typical cholecystitis was sixteen years of age while the oldest patient operated was 71 years old (Figure 1.)

Patients' Ages by Decades

First decade	0
Second decade	5
Third decade	13
Fourth decade	20
Fifth decade	31
Sixth decade	32
Seventh decade	26
Eighth decade	3

Figure 1. Distribution of the ages of the 130 cholecystectomized patients.

One hundred and fourteen of the 130 patients, or 87 percent, were females while 13 percent were males, a ratio of about seven females to one male.

The average time lapse between operation and the follow-up was 4.7 years with a range of from one to ten years. Reports have varied with different authors as to the amount of time necessary for the symptoms of the postcholecystectomy syndrome to appear but cases have been reported as having appeared "at once" following surgery while others have shown an interval as long as twenty-seven years before symptoms began. Morton (1948), for instance noted a time interval of from "at once" to fifteen years in his patients operated for cystic duct stump. Our review of patients will eventually reach back at least twenty years but at the present time the survey covers patients only for the last nine years.

ACUTE ATTACKS

MANY AUTHORS HAVE STATED THAT TYPICAL GALLBLADDER ATTACKS MUST BE PRESENT BEFORE THE CHOLECYSTECTOMY CAN BE EXPECTED TO GIVE THE DESIRED RESULTS. MOCK (1939) HAS SAID: "WE ALL KNOW THAT SURGERY HAS FAILED TO CURE A CONSIDERABLE PROPORTION OF PATIENTS SUFFERING FROM GALLBLADDER DISEASE. OUR BEST SURGICAL CURES ARE AMONG THOSE PATIENTS WITH VERY DEFINITE GALLBLADDER COLIC, DUE TO THE PRESENCE OF STONES. TOO OFTEN PATIENTS WHO ARE OPERATED ON FOR INDEFINITE GALLBLADDER SYMPTOMS FAIL TO SECURE RELIEF."

WITH THIS THOUGHT IN MIND WE CLASSIFIED EACH PATIENT AS TO THE TYPE OF ACUTE ATTACK AND THE TYPE OF DIGESTIVE DISTURBANCE PRESENT WITH THE ATTACK. THE ACUTE ATTACK WAS GRADED FROM ONE TO FOUR, ONE REPRESENTING A MILD ATTACK, TWO A SOMEWHAT MORE SEVERE ATTACK BUT REQUIRING NO MORPHINE, WHILE THREE WAS TYPICAL GALLBLADDER COLIC REQUIRING MORPHINE FOR RELIEF. GRADE FOUR WAS RESERVED FOR THOSE PATIENTS WITH COLIC AND WHO OBTAINED NO RELIEF FROM MORPHINE. THE ACUTE ATTACKS WERE ALSO CLASSIFIED AS ATYPICAL ATTACKS WHEN THE PAIN WAS NOT CHARACTERISTIC, THAT IS, IT WAS PRESENT ON THE

LEFT SIDE, DID NOT RADIATE TO THE BACK OR SHOULDER, AND SO ON. THESE ATTACKS WERE ALSO GRADED FROM ONE TO FOUR IN THE SAME MANNER AS FOR THE TYPICAL ATTACKS.

IT WAS FOUND THAT OF THE TOTAL NUMBER OF PATIENTS, 82.8 PERCENT HAD TYPICAL ATTACKS LEAVING 17.2 PERCENT WITH ATYPICAL ATTACKS. IN THE SAME WAY, 62.3 PERCENT OF THE PATIENTS HAD TYPICAL DIGESTIVE HISTORIES WHILE 37.7 PERCENT HAD ATYPICAL DIGESTIVE HISTORIES. CORRELATION OF THESE FIGURES WITH THOSE PATIENTS STILL HAVING DIFFICULTIES WILL BE MADE LATER IN THE REPORT. (FIGURE 2.)

ACUTE ATTACKS

PATIENTS WHO HAD TYPICAL GALLBLADDER ATTACKS---107
MILD ATTACKS-----------------------------------4
MORE SEVERE, NO MORPHINE REQUIRED------------46
COLIC LEVEL, REQUIRED MORPHINE---------------54
COLIC LEVEL, NO RELIEF WITH MOREPHINE---------3
PATIENTS WHO HAD ATYPICAL GALLBLADDER ATTACKS---23
MILD ATTACKS-----------------------------------9
MORE SEVERE, NO MORPHINE REQUIRED------------10
MORPHINE REQUIRED FOR RELIEF------------------4
NOT RELIEVED BY MORPHINE----------------------0

FIGURE 2. SUMMARY OF THE TYPES OF ATTACKS SEEN IN THE 130 CHOLECYSTECTOMIZED PATIENTS.

PRIBRAM (1950) EXPRESSED THE OPINION THAT A HIGH INCIDENCE OF RECURRENCE OF SYMPTOMS RESULTED IN CASES IN WHICH THE CHOLECYSTECTOMY WAS PERFORMED IN THE FACE

OF A NOT TOO BADLY DAMAGED GALLBLADDER WHICH WAS STILL SOMEWHAT FUNCTIONING. HE ALSO FELT THAT THE LONGER THE CONDITION, NAMELY LITHIASIS, HAD EXISTED THE BETTER THE CHANCES FOR COMPLETE RELIEF BECAUSE THE DUCTS HAD BEEN GIVEN THE OPPORTUNITY TO DILATE AND TAKE OVER THE FUNCTION OF THE GALLBLADDER AS RELIEF FROM PRESSURE. WOMACK AND CRIDER (1947) QUOTE BENSON WHO BELIEVED THAT DILITATION OF THE BILE DUCTS AFTER CHOLECYSTECTOMY WAS RESPONSIBLE FOR THE POST-OPERATIVE SYNDROME. THIS WAS DUE TO A LOSS OF ABSORPTIVE FUNCTION OF THE GALLBLADDER AND THEREFORE A RISE IN INTRADUCTAL PRESSURE. IF, DUE TO OBSTRUCTION OR STASIS, THE DUCTS HAVE BEEN PREVIOUSLY DILATED THEY WILL SUPPOSEDLY BE ABLE TO WITHSTAND HIGHER PRESSURES AND CAUSE LESS PAIN.

IN OUR SERIES IT WAS FOUND THAT THE AVERAGE DURATION OF SYMPTOMS BEFORE CHOLECYSTECTOMY WAS 70.6 MONTHS OR 5.9 YEARS. THE RANGE WAS EXTREME AND VARIED FROM TWO DAYS IN TWO PATIENTS TO THIRTY-EIGHT YEARS IN ONE PATIENT.

ROENTGENOGRAPHY

THE X-RAY REPORTS PREVIOUS TO SURGERY SHOWED STONES IN 43.8 PERCENT OF THE PATIENTS OPERATED. THE REPORT OF A NON-VISUALIZED GALLBLADDER WAS RETURNED IN 38.4

PERCENT OF THE PATIENTS AND NON-VISUALIZED GALL-BLADDER WITH STONES IN 5.3 PERCENT. DECREASED FUNCTION BUT NO EVIDENCE OF STONES WAS SEEN IN 3.6 PERCENT AND A NORMAL GALLBLADDER WAS VISUALIZED IN 8.0 PERCENT. IN ONE PATIENT CHOLESTEROSIS (CHOLESTEROLOSIS) OF THE GALLBLADDER WAS REPORTED.

SURGICAL FINDINGS

IN ALL CASES, OF COURSE, A CHOLECYSTECTOMY WAS PERFORMED BUT IN FORTY-ONE PATIENTS THE APPENDIX WAS ALSO REMOVED DURING THE OPERATION. IN SEVENTEEN OF THE 130 OPERATIONS A CHOLEDOCHOSTOMY WAS PERFORMED AND IN SIXTEEN PATIENTS A CHOLEDOCHOLITHOTOMY WAS EXECUTED.

THE FINDINGS REVEALED THAT 109 PATIENTS HAD STONES PRESENT IN THE GALLBLADDER AT THE TIME OF OPERATION. EIGHT PATIENTS HAD STONES IN THE CYSTIC DUCT AND EIGHTEEN COMMON DUCTS CONTAINED STONES. FORTY OF THE FORTY-THREE CASES REPORTED BY X-RAY AS HAVING A NON-VISUALIZED GALLBLADDER WITH NO EVIDENCE OF STONES REVEALED STONES AT SURGERY. THIS IS PARTICULARLY INTERESTING SINCE MOST FIGURES SHOW THAT ONLY APPROXIMATELY 80 PERCENT OF NON-VISUALIZED GALLBLADDERS BY X-RAY CONTAIN STONES.

In two cases a spasm of the sphincter of Oddi was identified at surgery. In one of these cases no stones were present but microscopic examination showed chronic cholecystitis. In the other case the pathological diagnosis was chronic cholecystitis with lithiasis. An esophageal hiatus hernia was identified in one case, five patients exhibited fistulous tracts and two showed perforation of the gallbladder with subsequent healing before surgery. Hydrops of the gallbladder was demonstrated in two cases. (Figure 4.)

Surgical Findings

Finding	Number
Patients with stones in gallbladder	109
Stones in cystic duct	8
Stones in common duct	18
Patients exhibiting marked adhesions	20
Spasm of sphincter of Oddi	2
Hiatus hernia	1
Fistulous tracts	5
Perforation of gallbladder, healed	2
Hydrops of gallbladder	2
Empyema of gallbladder	1

Figure 4. Findings revealed at the original operation for cholecystectomy.

Pathological Findings

Gross and microscopic pathological reports revealed that 104 cases had chronic cholecystitis with

LITHIASIS WHILE FIVE CASES HAD EVIDENCE OF CHRONIC AND ACUTE CHOLECYSTITIS WITH LITHIASIS. OF ALL THE CASES OPERATED, THEN 83.8 PERCENT HAD A DIAGNOSIS OF CHRONIC CALCULUS CHOLECYSTITIS. CHRONIC CHOLECYSTITIS WITHOUT STONES ACCOUNTED FOR TEN CASES OR 7.6 PERCENT. IN FOUR CASES (3.0 PERCENT) A DIAGNOSIS OF A NORMAL GALLBLADDER BUT WITH STONES PRESENT WAS MADE WHILE IN TWO CASES (1.5 PERCENT) A NORMAL GALLBLADDER WITH NO EVIDENCE OF STONES OR OTHER PATHOLOGY WAS PRESENT. THE PATHOLOGICAL DIAGNOSIS OF "NORMAL" GALLBLADDER CONTAINING STONES IS DOUBTFUL AND PROBABLY REPRESENTS TISSUE SECTIONS WHICH WERE NORMAL BUT WHICH WERE CUT FROM AN OTHERWISE DISEASED GALLBLADDER. THREE CASES SHOWED CHOLESTEROSIS OF THE GALLBLADDER WITH NO OTHER PATHOLOGY. ONLY ONE OF THESE CASES OF CHOLESTEROSIS WAS REPRESENTED AS SUCH BY X-RAY. THERE WERE ALSO PRESENT THREE INSTANCES OF ACUTE CHOLECYSTITIS WITH LITHIASIS AND ONE CASE OF SUBACUTE CHOLECYSTITIS WITH STONES.

IN ONLY SIX OF THE 130 OPERATIONS, AND CONSTITUTING 4.6 PERCENT OF GALLBLADDERS REMOVED, WERE NORMAL GALLBLADDERS PRESENT. (FIGURE 5.)

Pathological Findings

Finding	Number
Chronic cholecystitis with lithiasis	104
Chronic cholecystitis	10
Chronic and acute calculus cholecystitis	5
Acute cholecystitis with lithiasis	3
Subacute cholecystitis with lithiasis	1
Normal gallbladder with lithiasis	4
Normal gallbladder	2
Cholesterosis	3

Figure 5. Pathological findings from 130 cholecystectomies.

Mortality

Of the 311 patients operated by cholecystectomy at the University Hospital in the years from 1942 to 1950 there were nine deaths. This gives an uncorrected mortality rate of 2.9 percent. However, one patient had a cholecystectomy at the time of a gastric resection for a gastric ulcer which was the primary procedure. Another patient experienced removal of the gallbladder during the course of a laparotomy and the final diagnosis in this case was portal cirrhosis. A survey of those patients who died revealed:

1. Patient A.W., a male, was operated in 1942 at the age of 69. There was no autopsy allowed but clinical impression was that death was due to post-operative shock. Surgical pathology revealed subacute

CHOLECYSTITIS WITH LITHIASIS AND LOCALIZED HEPATITIS.

2. PATIENT W.O., FEMALE, WAS OPERATED IN 1942 AT THE AGE OF 63. AUTOPSY FINDINGS WERE: LIGATION AND THROMBOSIS OF THE HEPATIC ARTERY; HEPATIC NECROSIS; PULMONARY ATELECTASIS; PULMONARY EDEMA; CHRONIC GLOMERULOSCLEROSIS AND A MECKEL'S DIVERTICULUM. SURGICAL PATHOLOGY WAS CHRONIC CHOLECYSTITIS WITH LITHIASIS.

3. PATIENT M. F., FEMALE, WAS OPERATED IN 1943 AT THE AGE OF 67. AUTOPSY REVEALED: NECROTIC PERFORATION OF DUODENUM; SUBHEPATIC ABSCESS; PULMONARY INFARCTION; FATTY DEGENERATION OF LIVER; AND ARTERIOLARNEPHROSCLEROSIS. SURGICAL PATHOLOGY WAS CHRONIC CHOLECYSTITIS WITH LITHIASIS.

4. PATIENT E. N., FEMALE, WAS OPERATED IN 1943 AT THE AGE OF 50. AUTOPSY REVEALED: PULMONARY EMBOLUS; PULMONARY EDEMA; PULMONARY INFARCTION; MODERATE NEPHROSCLEROSIS; FATTY INFILTRATION OF THE MYOCARDIUM. SURGICAL SPECIMEN SHOWED CHRONIC CHOLECYSTITIS WITH LITHIASIS.

5. PATIENT M. P., FEMALE, WAS OPERATED IN 1943 AT THE AGE OF 13. FINDINGS ON AUTOPSY WERE: PORTAL CIRRHOSIS AND PULMONARY EDEMA. SURGICAL SPECIMEN

REVEALED MILD CHRONIC CHOLECYSTITIS.

6. PATIENT W. F., MALE, WAS OPERATED IN 1943 AT THE AGE OF 54. AUTOPSY SHOWED: GENERALIZED ARTERIOSCLEROSIS; PULMONARY EDEMA; HEALED DUODENAL ULCER; SCLEROSIS OF AORTIC VALVE; LOBULAR PNEUMONIA. THE GALLBLADDER REVEALED CHRONIC CHOLECYSTITIS.

7. PATIENT T. A., MALE, WAS OPERATED IN 1946 AT THE AGE OF 64. AUTOPSY REVEALED: BILE PERITONITIS; BILIARY FISTULA; BRONCHOPNEUMONIA; OBSTRUCTION OF BILE DUCTS OF LIVER; PASSIVE CONGESTION OF LIVER AND KIDNEYS. SURGICAL SPECIMEN SHOWED CHRONIC CHOLECYSTITIS WITH LITHIASIS.

8. PATIENT M. A., FEMALE, WAS OPERATED IN 1948 AT THE AGE OF 47. AUTOPSY; PULMONARY EDEMA; PURULENT CYSTITIS; ANTEMORTEM THROMBUS OF AURICLE; BRONCHIECTASIS OF LEFT LOWERLOBE; FOCAL ATELECTASIS OF LOWER LOBES; FIBROUS PLEURAL ADHESIONS; FOCAL HYPERPLASIA OF CORTEX OF RIGHT ADRENAL; ASTHMA; EARLY BRONCHOPNEUMONIA; CONGESTION OF SPLEEN; FATTY METAMORPHOSIS OF LIVER. SURGICAL SPECIMEN REVEALED BENIGN GASTRIC ULCER AND A NORMAL GALLBLADDER WITH LITHIASIS.

9. PATIENT F. E., FEMALE, WAS OPERATED IN 1950 AT THE AGE OF 29. NO AUTOPSY WAS ALLOWED BUT CLINICAL IMPRESSION WAS THAT OF RESPIRATORY PARALYSIS FOLLOWING THE USE OF A CURARE-LIKE DRUG DURING SURGERY. CHRONIC CALCULUS CHOLECYSTITIS.

CORRELATED STATISTICS

AS HAS BEEN PREVIOUSLY MENTIONED, TWENTY-NINE PATIENTS OF THE SERIES OF 130 WERE DETERMINED TO BE PLAGUED WITH COMPLAINTS PLACING THEM IN THE CATEGORY OF POSTCHOLECYSTECTOMY SYNDROMES. THIS IS 22.3 PERCENT OF THE TOTAL NUMBER OF PATINETS AND AGREES FAVORABLY (OR UNFAVORABLY, AS THE CASE MAY BE) WITH FIGURES GIVEN BY OTHER WRITERS. THESE PATIENTS MUST BE STUDIED MORE CLOSELY TO ATTEMPT TO DETERMINE THE FACTORS BEHIND THEIR SYMPTOMS. IT IS OBVIOUS THAT THE DEFINITIVE REASONS CANNOT BE GAINED FROM THE SUBJECTIVE ANSWERS GIVEN BY THE PATIENTS BUT INDICATIONS FOR THE OPTIMUM CRITERIA FOR OPERATION MAY BE REVEALED. NOT UNTIL THE PATIENTS ARE SEEN PERSONALLY CAN THE ACTUAL CAUSES BE DETERMINED.

THE AVERAGE AGE OF THESE TWENTY-NINE PATIENTS AT THE TIME OF OPERATION WAS 45 YEARS, ALMOST FOUR YEARS LESS THAN THE AVERAGE AGE FOR ALL PATIENTS IN THE SERIES.

THERE IS AN AVERAGE TIME LAPSE SINCE OPERATION OF 2.7 YEARS IN THESE TWENTY-NINE PATIENTS.

ROLE OF TYPICAL ATTACKS

TWENTY-FOUR OF THE TWENTY-NINE PATIENTS HAD HAD TYPICAL ACUTE ATTACKS OF VARYING DEGREE AND MAKE UP 82.7 PERCENT OF THE PATIENTS HAVING DIFFICULTY. THESE TWENTY-FOUR PATIENTS REPRESENT 22.6 PERCENT OF THE ENTIRE NUMBER OF PATIENTS WHO HAD TYPICAL ATTACKS WHILE IT WAS FOUND THAT 22.7 PERCENT OF THE PATIENTS WITH ATYPICAL ATTACKS OF PAIN HAD RECURRENCE, A FIGURE WHICH IS HARDLY SIGNIFICANT.

HOWEVER, IF WE CONSIDER THE IDEA OF VARIOUS WRITERS SUCH AS MOCK (1939) AND RAVDIN (1947) THAT THE POOREST RESULTS COME IN THOSE PATIENTS IN WHOM DEFINITE GALL-BLADDER COLIC WAS NOT PRESENT WE FIND MORE SIGNIFICANT FIGURES.

SIXTEEN OF THE TWENTY-NINE PATIENTS HAD A HISTORY OF TYPICAL ATTACKS MILD ENOUGH THAT MORPHINE WAS NOT REQUIRED FOR RELIEF AND WHOSE ATTACKS WERE BELOW THE GALLSTONE COLIC LEVEL. THESE PATIENTS COMBINED WITH THOSE WHO HAD ATYPICAL ATTACKS TOTALED TWENTY-ONE OF THE TWENTY-NINE PATIENTS OR 72.4 PERCENT OF THE TOTAL. THE SIXTEEN PATIENTS WITH RECURRENCE OF PAIN BELOW THE

COLIC LEVEL MADE UP 32 PERCENT OF THOSE PATIENTS WHO HAD TYPICAL ATTACKS BUT DID NOT REQUIRE MORPHINE FOR RELIEF. THIS LEAVES ONLY EIGHT OF THE TWENTY-NINE PATIENTS (27.5 PERCENT) WHO HAD TYPICAL ATTACKS OF COLIC AND REQUIRED MORPHINE, THE EIGHT PATIENTS CONSTITUTING ONLY 14.2 PERCENT OF THE TOTAL NUMBER OF PATIENTS HAVING TYPICAL ATTACKS REQUIRING MORPHINE. OF THE 130 PATIENTS, THEN, TWENTY-ONE, OR 16.1 PERCENT, HAD RECURRENCE OF PAIN WHOSE HISTORY SHOWED ATYPICAL ACUTE ATTACKS OR TYPICAL ATTACKS BELOW THE COLIC LEVEL, WHILE ONLY EIGHT 6.1 PERCENT, OF THOSE CASES WITH HISTORIES OF PAIN ABOVE THE COLIC LEVEL SHOWED RECURRENCE.

THIS WOULD SEEM TO INDICATE THAT FOR BEST RESULTS THE PATIENT SHOULD HAVE A HISTORY OF TYPICAL ACUTE ATTACKS OF PAIN WHICH ARE SEVERE ENOUGH TO BE CLASSED IN THE CATEGORY OF GALLSTONE COLIC. FROM OUR FIGURES THOSE PATIENTS WHO DO NOT HAVE TYPICAL ATTACKS OR WHOSE ATTACKS ARE TYPICAL BUT OF A MILD DEGREE ARE DOOMED TO A HIGHER PERCENTAGE OF FAILURES. (FIGURE 3.)

ACUTE ATTACKS IN THOSE PATIENTS
NOW HAVING POSTCHOLECYSTECTOMY SYMPTOMS

PATIENTS WHO HAD TYPICAL GALLBLADDER ATTACKS----	24
MILD ATTACKS------------------------------------	2
MORE SEVERE, NO MORPHINE REQUIRED-----------	14
COLIC LEVEL, REQUIRED MORPHINE--------------	7
COLIC LEVEL, NO RELIEF WITH MORPHINE---------	1
PATIENTS WITH ATYPICAL GALLBLADDER ATTACKS------	5
MILD ATTACKS------------------------------------	1
MORE SEVERE, NO MORPHINE REQUIRED-----------	4

FIGURE 3. TYPES OF GALLBLADDER ATTACKS SEEN IN THE 29 PATIENTS WITH POSTCHOLECYSTECTOMY STATES.

DIGESTIVE DISTURBANCES

FOURTEEN OF THE TWENTY-NINE PATIENTS (48.3 PERCENT) HAD ATYPICAL DIGESTIVE HISTORIES WHILE FIFTEEN HAD TYPICAL DIGESTIVE HISTORIES. HOWEVER, OF THE TOTAL NUMBER OF CASES WITH ATYPICAL DIGESTIVE HISTORIES, 29.1 PERCENT HAD RECURRENCE OF SYMPTOMS FOLLOWING CHOLECYSTECTOMY WHILE ONLY 18.9 PERCENT OF THOSE WITH TYPICAL DIGESTIVE HISTORIES HAD DIFFICULTY FOLLOWING OPERATION.

BATES AND EMENHISER (1946) EXPRESS A CONSERVATIVE STATEMENT CONCERNING SURGERY WHEN THEY SAY: "THE GREATEST PERCENTAGE OF OPERATIVE FAILURES IN ALL TYPES OF SURGERY OCCURS WHERE THE OPERATION IS PERFORMED FOR RELIEF OF PAIN RATHER THAN THE CORRECTION OF PROVEN DISTURBANCES IN PHYSIOLOGY. ALVAREZ (1944) STATES THAT IN

ALL CASES OF CHOLECYSTITIS WITHOUT JAUNDICE THE BILE IS FLOWING FROM THE LIVER INTO THE DUODENUM WITHOUT HINDRANCE AND THAT FREQUENTLY THE CHOLECYSTOGRAM SHOWS THAT THE GALLBLADDER IS FUNCTIONING FAIRLY WELL. THUS, IF DIGESTIVE DISTURBANCES TYPICAL OF GALLBLADDER DISEASE ARE NOT PRESENT THERE IS SOME DOUBT THAT SURGERY FOR THE RELIEF OF PAIN WILL BE OF VALUE IF THERE IS NO CORRECTION OF THE DISTURBED PHYSIOLOGY INVOLVED.

OUR RESULTS WOULD APPEAR TO SUPPORT THIS VIEW FOR IN THOSE PATIENTS WITH DIGESTIVE DISTURBANCES NOT TYPICAL OF GALLBLADDER DISEASE THE UNDERLYING PHYSIOLOGY WAS APPARENTLY NOT CORRECTED BY THE REMOVAL OF THE GALLBLADDER.

DURATION OF PRESENT ILLNESS

TWENTY-ONE OF THE TWENTY-NINE PATIENTS HAD A DURATION OF THE PRESENT ILLNESS WHICH WAS LESS THAN THE AVERAGE OF 5.88 YEARS FOR THE ENTIRE GROUP. THE AVERAGE DURATION OF SYMPTOMS FOR THE PATIENTS SUFFERING FROM POSTCHOLECYSTECTOMY COMPLAINTS WAS 58.4 MONTHS AS OPPOSED TO THE 70.6 MONTHS AVERAGE FOR THE OVERALL GROUP.

SUPERFICIALLY THIS SEEMS TO SUPPORT THE VIEWS OF PRIBRAM (1950) AND WOMACK AND CRIDER (1947) THAT IF THE

GALLBLADDER DISEASE HAS EXISTED FOR A RELATIVELY LONG PERIOD OF TIME THE RESULTS WILL BE MORE SATISFACTORY. HOWEVER, THE FACT THAT THE AVERAGE LENGTH OF TIME THE SYMPTOMS WERE PRESENT BEFORE SURGERY IN THESE PATIENTS WAS NEARLY FIVE YEARS MAKES THE FIGURES INSIGNIFICANT.

PATHOLOGY REPORTS

SEVERAL WRITERS, SUCH AS WOMACK AND CRIDER (1947), RAVDIN (1947), MOCK (1939) AND OTHERS FEEL THAT THE PRESENCE OF STONES IS NECESSARY FOR THE PROPER RELIEF TO BE OBTAINED BY CHOLECYSTECTOMY. MACDONALD (1943) STATES THAT STATISTICS FROM TEACHING HOPSITALS SHOW THAT 90 PERCENT OF PATIENTS WITH CALCULUS DISEASE OBTAIN GOOD RESULTS. HE SAYS THAT WITH CALCULI, THE CAUSE IS REMOVED BY SURGERY BUT IF STONES ARE NOT PRESENT THE CAUSES (HEPATITIS, CHOLANGITIS, COMMON DUCT DISEASE, PYLOROSPASM, ETC.) ARE NOT REMOVED AND SYMPTOMS WILL REMAIN FOLLOWING SURGERY.

PATHOLOGICAL REPORTS OF THE SURGICAL SPECIMENS OBTAINED IN THE TWENTY-NINE PATIENTS STILL EXPERIENCING DIFFICULTY REVEALED THAT TWENTY-FOUR OF THE PATIENTS DEFINITELY HAD CHRONIC CALCULUS CHOLECYSTITIS. THREE PATIENTS HAD ONLY CHRONIC CHOLE-

cystitis without lithiasis (one of these cases had spasm of the sphincter of Oddi which was revealed at operation) and two patients had "normal" gall-bladders in which stones were present.

Thus 22 percent of those patients with chronic calculus cholecystitis had recurrence of symptoms while 30 percent of those with chronic cholecystitis without stones had recurrence. Fifty percent of those patients with stones present in a "normal" gall-bladder had post-operative difficulties. (Figure 6.)

PATHOLOGICAL FINDINGS IN THOSE PATIENTS NOW HAVING POSTCHOLECYSTECTOMY SYMPTOMS

Chronic cholecystitis with lithiasis--------	24
Chronic cholecystitis-----------------------	3
Normal gallbladder with lithiasis-----------	2

Figure 6. Pathology found in those 29 patients now having postcholecystectomy states.

Post-Operative Drainage

Post-operative drainage was used in every case but T-tubes were used in only twenty-seven of the 130 cases. In seven of the patients a three day biliary flush was used in conjunction with the T-tube and in seven patients only a three day flush was used.

Of the twenty-nine patients with postcholecystectomy symptoms, three had had a T-tube and three day flush

AND THREE OTHERS HAD HAD ONLY A T-TUBE. NONE OF THESE PATIENTS HAD HAD A THREE DAY FLUSH ONLY. THE NUMBER OF PATIENTS HAVING BILIARY FLUSHES IS SO SMALL THAT THE FIGURES ARE NOT SIGNIFICANT BUT BEST, HICKEN AND FINLAYSON (1939) HAVE SHOWN THAT THE ADMINISTRATION OF THE OXIDIZED, UNCONJUGATED BILE ACIDS IS FOLLOWED BY A CONSIDERABLE INCREASE IN THE PRESSURE UNDER WHICH THE BILE FLOWS THROUGH THE BILE DUCTS. SUCH AN INCREASE IN PRESSURE OF BILE IS AN AID IN OVERCOMING A TENDENCY TO STASIS WITHIN THE DUCTS, HELPS FLUSH OUT MUCUS, CELLULAR WASTES AND POSSIBLY SMALL CALCULI WITHIN THE BILE DUCTS. SUCH AN INCREASE IN PRESSURE MAY ALSO AID IN OVERCOMING SPASTIC STATES AROUND THE SPHINCTER OF ODDI.

REVIEW OF PATIENTS

MERE STATISTICS ALONE ARE OF LITTLE VALUE IN THE DETERMINATION OF THE FACTORS BEHIND THE POSTCHOLE-CYSTECTOMY SYNDROME. ACTUALLY, IN MOST CASES THE REASONS ARE NOT AT ALL VAGUE BUT ARE OFTEN VERY SIMPLE, INVOLVING A MISTAKEN DIAGNOSIS, PATHOLOGY IN OTHER ORGANS STILL PRESENT AFTER SURGERY (HEART DISEASE, ULCER, DIABETES, ETC.), INCISIONAL HERNIA AND SO ON.

It is, however, difficult to determine these conditions only from previous hospital records and from subjective reports from the patients themselves and definitive classification must necessarily wait until the patients are seen and examined. A tentative classification of each patient involved in the post-cholecystectomy syndromes of our series is presented below.

1. Patient L. P., female, age 51. Complains of pain in the lower abdomen relieved by atropine and morphine. Cabbage, lettuce, carrots and meat cause difficulty. Has diabetes and mild hypertension. Classified as possible duct stones since surgery revealed chronic cholecystitis and lithiasis.

2. Patient S. R., female, age 33. Complains of pain in the center of the stomach relieved by morphine and caused by ham. Food idiosyncracies to coffee, pork, eggs and spices. Cystic duct stump left at surgery. Numerous stones found. Probable classification of biliary dyskinesia with possible cystic duct stump syndrome.

3. Patient E. S., female, age 48. Complains of pain through stomach and liver area which is dull ache with soreness. Relieved by lying down and

RESTING. GAS IN LOWER BOWEL. OPERATION REVEALED STONE IN NECK OF CYSTIC DUCT AND HEALED DUODENAL ULCER. CHRONIC CALCULUS CHOLECYSTITIS. PROBABLY IS BILIARY DYSKINESIA.

4. PATIENT E. T., FEMALE, AGE 30. COMPLAINS OF PAIN IN RIGHT SIDE ON LEVEL WITH UMBILICUS WITH NAUSEA AND VOMITING, TIREDNESS AND DIZZINESS. CHRONIC CALCULUS CHOLECYSTITIS. ANXIETY STATE DIAGNOSED WHILE IN THE HOSPITAL. PROBABLY IS STILL ANXIETY STATE.

5. PATIENT E. A., FEMALE, AGE 46. COMPLAINS OF PAIN IN RIGHT UPPER QUADRANT WHICH IS MORE SEVERE THAN BEFORE SURGERY. HAS NOTICED JAUNDICE THREE MONTHS AFTER SURGERY. SPASM OF SPHINCTER OF ODDI SEEN AT OPERATION AND DILATED. CHRONIC CHOLECYSTITIS BY PATHOLOGY. PROBABLY IS STRICTURE OF COMMON DUCT.

6. PATIENT A. D., FEMALE, AGE 55. COMPLAINS OF GAS AND BLOATING WITH PERIODS OF JAUNDICE. NO FREE ACID ON GASTRIC ANALYSIS. COMMON DUCT STONE BY CHOLANGIOGRAM AFTER SURGERY REMOVED BY THREE DAY FLUSH. RETURNED LATER WITH EVIDENCE OF FURTHER COMMON DUCT OBSTRUCTION. HAS HYPERTENSION AND ANEMIA. CLASSIFICATION OF COMMON DUCT STONE OR STRICTURE.

7. Patient A. H., male, age 53. Complained of pain on right side of back. Numerous adhesions found at surgery. Chronic cholecystitis without stones. Hypochondriacal diagnosis by psychiatry. Kidney stone by x-ray.(not done at the University Hospital). Classification as error in diagnosis.

8. Patient E. K., female, age 67. Complains of stinging pain in right side at site of drainage tube. Arteriosclerotic heart disease with hypertension. Adhesions and 75 stones found at surgery. Arthritis at present time. Obese. Classification: probable neuroma.

9. Patient R. B., female, age 44. Complains of pain in center of abdomen with nausea and soreness. Relieved by rest. Says local doctor told her she had too much gastric acid and spasm of stomach. Surgery revealed numerous adhesions. Chronic calculus cholecystitis. Probable classification is pyloro-spasm or biliary dyskinesia.

10. Patient M. F., female, age 31. Complains of pain at site of drainage tube with a large bump present at times. X-ray showed decreased function but no stones. Chronic calculus cholecystitis.

Classified as incisional hernia.

11. Patient M. M., female, age 65. Complains of pain in upper right quadrant and epigastrium caused by rich foods and cabbage and relieved by hypodermic injections. Nausea and vomiting relieved by antispasmodics and Bilron. Epileptic attacks associated with pain in abdomen. Cystic duct stump left at surgery. Classification: Biliary dyskinesia.

12. Patient V. K., female, age 41. Complains of pain over area of gallbladder. Relieved by rest and local heat. Incisional hernia from previous laparotomy repaired at time of cholecystectomy (chronic cholecystitis without lithiasis). Probably is biliary dyskinesia.

13. Patient B. N., female, age 36. Complains of pain on the right side with bloating, swelling of hands and feet and shortness of breath. Diagnosis of bronchiectasis and lithiasis (normal gallbladder) and diabetes while in hospital. Classified as error in diagnosis.

14. Patient N. E., female, age 67. Complains of pain over entire abdomen and left side. Had chole-

CYSTOTOMY WITH SUBSEQUENT CHOLECYSTECTOMY WITH LITHOTOMY. DIVERTICULOSIS BY X-RAY. INCISIONAL HERNIA STILL PRESENT. PROBABLY IS DUE TO INCISIONAL HERNIA AND POSSIBLY DIVERTICULITIS.

15. PATIENT F. D., FEMALE, AGE 45. COMPLAINS OF PAIN IN THE REGION OF GALLBLADDER AND LIVER RELIEVED BY DIET, REST AND HEAT. HAS HYPERTENSION AND KIDNEY TROUBLE. PROBABLE CLASSIFICATION: ABSENCE OF GALLBLADDER FUNCTION OR BILIARY DYSKINESIA. RENAL DISEASE.

16. PATIENT G. W., FEMALE, AGE 61. COMPLAINS OF PAIN TO THE RIGHT OF THE GALLBLADDER INCISION WHICH IS TENDER AND SORE. IS CONSTIPATED AND HAD ONE ATTACK OF JAUNDICE (?). DIAGNOSIS OF PSYCHONEUROSIS IN HOSPITAL. CHRONIC CALCULUS CHOLECYSTITIS. HAS ARTHRITIS AT PRESENT TIME. CLASSIFIED: BILIARY DYSKINESIA, PSYCHONEUROSIS, POSSIBLE NEUROMA.

17. PATIENT G. A., MALE, AGE 62. COMPLAINS OF PAIN BELOW LEFT COSTAL MARGIN AND EPIGASTRIUM RELIEVED BY FOOD FOR SHORT INTERVALS. HAD LOW FREE ACID ON GASTRIC ANALYSIS. RUPTURED ULCER 23 YEARS AGO. CHRONIC CHOLECYSTITIS AND LITHIASIS. DIAGNOSIS AS CARCINOMA OF THE STOMACH IN SURGERY CLINIC THIS YEAR.

Classification may be error in diagnosis if the carcinoma was present at the time of surgery.

18. Patient M. H., female, age 74. Complains of two or three attacks of pain in the upper abdomen caused by tomatoes and relieved by soda and Desicol. Had heart attack. Hypertension and heart disease. Had common duct stone with dilitation of common duct. Chronic calculus cholecystitis. Classified as absence of gallbladder function.

19. Patient E. L., age 47. Complains of pain in epigastrium, more severe than before surgery and relieved by "shots". Hyperthyroid. One year after surgery entered for choledocholithotomy. Pathology report was chronic calculus choleycstitis. Classified as common duct stone.

20. Patient C. H., female, age 20. Complaining of pain on right side under ribs caused by eating and relieved by vomiting and local heat. Has been jaundiced with each attack. At surgery had normal gallbladder with stones. Classified: error in diagnosis, adhesive stricture of common duct, possible common duct stone.

21. Patient E. B., female, age 52. Complains of pain under ribs on right side about every three or

FOUR MONTHS WHICH IS DESCRIBED AS A "SORENESS" AND CAUSED BY FOOD. HAD INCISIONAL HERNIA. SURGERY REVEALED NUMEROUS ADHESIONS AND STONES. PATIENT VERY NERVOUS. CLASSIFIED AS FUNCTIONAL.

22. PATIENT G. L., FEMALE, AGE 45. COMPLAINS OF CRAMPING PAIN OVER SCAR WITH A LUMP THAT FORMS WHEN PATIENT BENDS OVER. MILD CHRONIC CHOLECYSTITIS AND LITHIASIS. CLASSIFIED: INCISIONAL HERNIA.

23. PATIENT F. G., FEMALE, AGE 49. COMPLAINS OF PAIN IN THE PIT OF THE STOMACH AS BEFORE SURGERY BUT NOT AS SEVERE WITH OCCASIONAL DIARRHEA. HYPOTHYROID. LOW FREE AND TOTAL ACID WITH HISTAMINE STIMULATION. CLASSIFIED: BILIARY DYSKINESIA.

24. PATIENT S. P., FEMALE, AGE 58. COMPLAINS OF SORENESS IN THE AREA OF THE GALLBLADDER AS SEVERE AS BEFORE SURGERY. RELIEVED BY SODA. TOLD BY LOCAL DOCTOR THAT STONES STILL PRESENT. CYSTIC DUCT STUMP LEFT AT SURGERY AT WHICH TIME CHOLESTEROSIS WITH LITHIASIS WAS FOUND. ONE YEAR LATER RETURNED COMPLAINING OF COLIC AND RELIEVED BY BILIARY FLUSH. CLASSIFIED AS RESIDUAL STONES.

25. PATIENT L. V. K., FEMALE, AGE 27. COMPLAINS

OF PAIN IN RIGHT UPPER QUADRANT AS SEVERE AS BEFORE SURGERY, CAUSED BY PORK AND NERVOUSNESS AND RELIEVED BY MORPHINE, CODEINE AND VOMITING. NO FREE ACID ON GASTRIC ANALYSIS. NUMEROUS PEA-SIZED STONES. CLASSIFIED AS PROBABLE STONE IN COMMON DUCT OR BILIARY DYSKINESIA.

26. PATIENT F. S., MALE, AGE 59. COMPLAINS OF PAIN IN THE PIT OF THE STOMACH AS SEVERE AS BEFORE SURGERY AND RELIEVED BY VOMITING AND "HYPO". SURGERY REVEALED ADHESIONS TO LIVER AND STONE IN THE AMPULLA. CHRONIC CALCULUS CHOLECYSTITIS. CLASSIFIED AS DYSKINESIA.

27. PATIENT F. C., MALE, AGE 50. COMPLAINS OF PAIN DIRECTLY ABOVE THE INCISION AND CAUSED BY COUGHING AT WHICH TIME A LUMP APPEARS. CHRONIC AND ACUTE CALCULUS CHOLECYSTITIS. CLASSIFIED: INCISIONAL HERNIA.

28. PATIENT L. W., FEMALE, AGE 51. COMPLAINS OF PAIN IN THE AREA OF THE INCISION AND CAUSED BY FOOD AND TIREDNESS, RELIEVED BY REST AND BELCHING. NUMEROUS ADHESIONS AT SURGERY. CLASSIFIED: DYSKINESIA.

29. PATIENT L. G., FEMALE, AGE 64. COMPLAINS OF NAGGING PAIN IN THE RIGHT UPPER QUADRANT WHICH IS

"sore as a boil" and which "comes and goes". Low free and total acid with histamine stimulation. Chronic calculus cholecystitis. Classified as possible incisional hernia.

Tentative Classification
Of Patients

Common duct stones	5
Biliary dyskinesia	8
Functional	3
Common duct stricture	2
Error in diagnosis	3
Neuroma	1
Incisional hernia	5
Absence of gallbladder	2

Figure 7. Tentative classification of patients as to cause of their postcholecystectomy states.

STANDARD PROCEDURES TO BE USED IN THE STUDY OF PATIENTS PRESENTING POSTCHOLECYSTECTOMY SYMPTOMS

As has already been stated, and as can be seen from the above patients, the final diagnosis and classification of their difficulties cannot be made until the patients have been seen. Each patient listed above will be asked to return to the University clinic or hospital to be re-examined. It is hoped that as many patients

AS POSSIBLE WILL RETURN FOR EVALUATION.

THE FOLLOWING IS THE ROUTINE WHICH WILL BE USED IN THE EXAMINATION:

1. COMPLETE HISTORY
2. COMPLETE PHYSICAL EXAMINATION
3. REVIEW OF PREVIOUS RECORDS
4. COMPLETE BLOOD COUNT
5. URINE ANALYSIS
6. SEDIMENTATION RATE
7. BROMSULFALEIN TEST (UNLESS JAUNDICE IS PRESENT)
8. GASTRIC ANALYSIS (MULTIPLE AS NEEDED INCLUDING NIGHT ACIDS)
9. CHOLANGIOGRAM USING PRIODAX (ALL CASES OF JAUNDICE REFERRED TO THE STAFF FOR DECISION)
10. UPPER GASTRO-INTESTINAL X-RAY SERIES
11. LYON-MELTZER DUODENAL DRAINAGE

WHEN THE ABOVE TESTS DO NOT REVEAL THE UNDERLYING PATHOLOGY FURTHER EXAMINATIONS WILL BE PERFORMED:

CARDIAC

1. MEDICAL CONSULTATION
2. ELECTROCARDIOGRAM

FUNCTIONAL DISEASE

1. PSYCHIATRY CONSULTATION

HEPATITIS

1. CEPHALIN-CHOLESTEROL FLOCCULATION
2. ALKALINE PHOSPHATASE
3. ALBUMIN-GLOBULIN RATIO

JAUNDICE

1. URINARY UROBILINOGEN
2. SERUM BILIRUBIN

COLON DISEASE

1. PROCTOSCOPIC EXAMINATION
2. BARIUM ENEMA AFTER THE ABOVE

BILIARY DYSKINESIA

1. Morphine-secretin test

PANCREATIC DISEASE

1. Blood sugar
2. Glucose tolerance
3. Duodenal drainage with secretin and Mecholyl stimulation
4. Serum amylase or lipase if indicated.

SUMMARY

It is felt that the recurrence of previous symptoms following cholecystectomy occurs too frequently for a procedure that is supposed to be a definitive one. For this reason it was decided to review the cases of cholecystectomy at the University Hospital, University of Nebraska College of Medicine.

Questionnaires were sent to 311 cholecystectomized patients and upon their return to us each patient's hospital chart was reviewed and pertinent facts placed on a master chart for use later in correlation of the patient's answers in an attempt to determine reasons for the so-called "postcholecystectomy syndrome".

A brief review of the literature is presented to give the concepts of various authors as to the causes of symptoms following cholecystectomy.

A COMPREHENSIVE CLASSIFICATION OF CAUSES OF SYMPTOMS FOLLOWING CHOLECYSTECTOMY IS PRESENTED ALONG WITH A DIFFERENTIAL DIAGNOSIS OF RIGHT UPPER QUADRANT PAIN AND SHORT EXPLANATIONS OF SOME OF THE CAUSES WHICH MAY BE UNFAMILIAR.

THE METHOD OF FOLLOW-UP AND A SAMPLE QUESTIONNAIRE ARE PRESENTED.

STATISTICS DEALING WITH THE ENTIRE GROUP OF 130 PATIENTS WHO RETURNED QUESTIONNAIRES ARE GIVEN AND ILLUSTRATE THE AVERAGE AGES AND SEX RATIOS INVOLVED. THEY ALSO DEAL WITH THE GENERAL STATISTICS OBTAINED FROM THE ANSWERS TO THE QUESTIONNAIRE AND FROM THE INFORMATION GAINED FROM THE PATIENTS' HOSPITAL CHARTS. THEY PRESENT SUCH THINGS AS THE TYPES OF ATTACKS, DIGESTIVE DISTURBANCES, X-RAY RESULTS, SURGERY PERFORMED AND THE PATHOLOGICAL REPORTS FROM THE SURGICAL SPECIMENS. THE OPERATIVE MORTALITY RATES ARE PRESENTED ALONG WITH INFORMATION GAINED FROM AUTOPSY.

INDIVIDUAL CORRELATIONS ARE THEN GIVEN FOR THE TWENTY-NINE PATIENTS WHOM WE BELIEVED TO BE TROUBLED BY THE POSTCHOLECYSTECTOMY SYNDROME. THESE STATISTICS DEAL WITH SOME OF THE SAME SUBJECTS AS LISTED ABOVE ALONG

WITH SUCH THINGS AS POST-OPERATIVE DRAINAGE, DURATION OF COMPLAINTS AND PATHOLOGICAL REPORTS IN THESE PATIENTS.

EACH PATIENT EXPERIENCING THE SYMPTOMS USUALLY SEEN AFTER CHOLECYSTECTOMY IS THEN PRESENTED WITH A BRIEF DESCRIPTION OF HIS COMPLAINTS AT PRESENT, ABNORMALITIES IN HIS HOSPITALIZATION AND A TENTATIVE CLASSIFICATION OF THE POSSIBLE CAUSE OF THE SYMPTOMS.

THE PROCEDURES FOR THE CLINICAL FOLLOW-UP OF THESE PATIENTS ARE THEN GIVEN, INCLUDING THE VARIOUS TESTS AND EXAMINATIONS WHICH WILL BE DONE ON EACH PATIENT AND THE SPECIAL TESTS RESERVED FOR MORE DIFFICULT DIAGNOSES.

CONCLUSIONS

1. THE PRESENCE OF SYMPTOMS SIMILAR TO THOSE EXPERIENCED BEFORE CHOLECYSTECTOMY OCCUR TOO FREQUENTLY, AFTER THE CHOLECYSTECTOMY, FOR A PROCEDURE WHICH IS PRESUMED TO BE DEFINITIVE.

2. THE CAUSES OF SYMPTOMS FOLLOWING CHOLECYSTECTOMY ARE NUMEROUS AND CAN BE PLACED IN BOTH PREVENTABLE AND NON-PREVENTABLE GROUPS.

3. THOSE PATIENTS WITH TYPICAL GALLBLADDER ATTACKS WITH PAIN AT THE COLIC LEVEL AND WITH THE PRESENCE OF STONES SEEM TO GAIN THE BEST RESULTS FROM CHOLECYSTECTOMY.

4. Careful selection of cases with responsible history and physical examinations followed by adequate and meticulous surgery will aid in the reduction of postcholecystectomy complaints.

5. Those patients suffering from the postcholecystectomy syndrome should be rendered relief by careful consideration of the complaints, bearing in mind all of the possible causes of the syndrome, proper use of laboratory aids and intelligent selection of therapy.

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