Complications of Cholecystitis

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COMPLICATIONS OF CHOLECYSTITIS*

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Cholelcystitis is one of our most common diseases. Acute cholecystitis, because of its severity, usually receives attention, but chronic cholecystitis is usually neglected for an indefinite time because of its insidious onset. The symptoms point to gastric disturbances rather than that of the gall bladder, so it often goes unsuspected by both the patient and the physician and when diagnosed its significance is frequently not realized. It is for the purpose of calling attention to the results of neglect in treatment of chronic cholecystitis that this paper is being written. It will be impossible to cover all of the complications of cholecystitis in a single paper. This paper is one of a series of five which are being prepared on various phases of the subject.

The complications of cholecystitis may be classified as follows:

I. Intrinsic.
- A. Gall Stones.
- B. Ulceration.
- C. Perforation.
- D. Stricture.
- E. Gangrene.
- F. Luschka glands.
- G. Tumors.
  1. Benign.
     a. Papillomata.
     b. Adeno-papillomata.
  2. Malignant.
     a. Sarcoma.
        (I) Primary.
        (II) Metastatic.
     b. Carcinoma.
        (I) Primary.
            (A) Adeno carcinoma
            (B) Papillary Carcinoma
            (C) Cylindrical cell carcinoma
            (D) Squamous cell carcinoma
            (E) Round cell carcinoma.
        (II) Metastatic carcinoma.

II. Extrinsic.
- A. General. Various symptoms and manifestations that may come from focal infection.
- B. Local.
  1. Hepatitis
  2. Pancreatitis
  3. Peritonitis
     a. Local
     b. General
  4. Arthritis
  5. Neuritis
  6. Myocarditis and endocarditis
  7. Enteritis.
     a. Colitis
  8. Cholangitis and infection of larger ducts
  9. Secondary anemia.

Under intrinsic complications the various types of inflammation are not included, as these are varieties of cholecystitis rather than complications. Gall stones, perhaps, should not be included, as they are such a common accompaniment of chronic cholecystitis, yet they are not always present and they are nearly always, if not always, secondary to gall bladder infection. Ulceration may be the result of either tissue destruction through the action of very virulent organisms, or pressure necrosis from gall stones. The ulcer may be so extensive that a good share of the mucosa is involved, or it may be deep and result in perforation. In a series of one thousand gall bladders studied at the Pathological Institute in the University of Vienna, I found one in which almost the entire mucosa had been replaced by scar tissue covered with thin epithelium. With the healing of extensive ulcers a stricture (5) producing a deformity often occurs. This deformity may be slight, or it may be so extensive as to nearly or completely obstruct the lumen. The acquired stricture is usually found in the proximal half of the gall bladder, in contradistinction to the congenital elbow deformity which always occurs in the distal third. Gangrene results from extensive inflammation with virulent organisms.

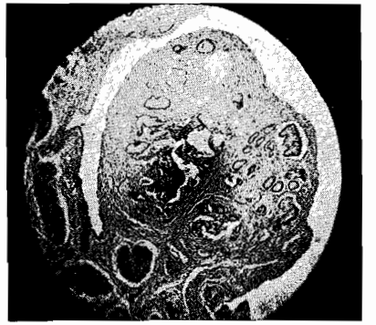

Figure No. 1

The significance of the relationship of chronic cholecystitis to tumors (7) of the gall bladder is not fully realized. It is quite doubtful if the benign tumors or carcinoma develop except in the presence of a long standing chronic cholecystitis. The most frequent benign tumor is papilloma. When present, they usually exist as small delicate, finger-like projections. In the series of cases referred to, I found one adeno-papilloma (Fig. 1).

Primary sarcoma occurs, but is rare. There were none in this series. Metastatic sarcoma is also rare.

Carcinoma of the gall bladder is not as rare as is often supposed. In the Breslau statistics it was found in 5 per cent; in Basle in 5.19 per cent; and in Gottingen statistics it was found in 6 per cent.

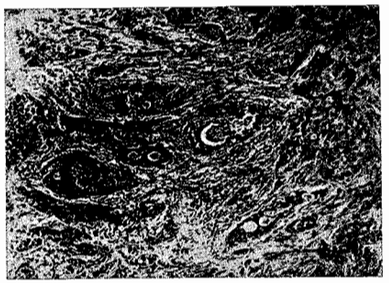

Figure No. 2

Adenoma carcinoma (Fig. 2) is the most frequent form. At first thought this appears difficult to explain because there are no normal glands in the gall bladder. A study of a large series of chronically infected gall bladders, however, shows that glands develop as a result of prolonged irritation as was pointed out in a previous paper (6).

The epithelial lining of the gall bladder is of the same origin as the epithelium of the liver. Liver epithelium has a high regenerative power. This explains the formation of the adenoma-like masses which maintain the normal liver function following extensive destruction of liver substance as is seen in certain cirrhosis.. After a prolonged irritation of the epithelium lining the gall bladder, hyperplasia occasionally occurs with a prolongation of epithelial masses outward along the courses of the blood vessels that penetrate the muscularis to reach the mucosa. These epithelial tubes (Fig. 3) continue to grow down into the muscularis where growth may stop, and in which case they remain as mere ducts, or they may continue to grow on into the fibrosa forming acini and becoming complete mucous glands similar to those seen normally in the cystic and common ducts. Obstruction to the duct of these glands may result in cystic formation. These glands were first described by Luschka and are known as the Luschka glands or ducts. Adeno-carcinoma originates either from these glands, adeno-papillomata, or the fundus adenoma which may be of congenital origin.

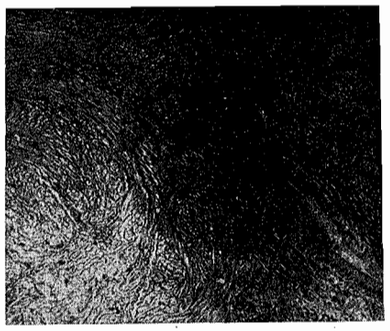

Figure No. 3

Papillomatous carcinoma is less common. This is difficult to explain for papillomata of the gall bladder are more frequent than are the Luschka glands or other adenomata. Cylindrical-celled, squamous-celled, and round-celled carcinomas occur, but are rare. I found one melano-carcinoma metastasis from a primary melano-carcinoma of the choroid of the eye.

The early diagnosis of carcinoma of the gall bladder can be made only by its removal at operation. Late carcinoma may be suspected in patients giving a history of a long standing cholecystitis with a mass in the liver.

The extrinsic complications may be either or both general, or local. An infected gall bladder may act as a focus of infection from which toxins or organisms may be carried to any part of the body. A most striking example of the gall bladder as a source from which toxins may be distributed was seen in a physician about 18 months ago. He had been having various pains over a considerable period of time. His teeth and tonsils, both of which showed infection, had been removed, yet without relief. He developed a spinal arthritis with lipping. There was also involvement of the right sciatic nerve with pain and areas of paresthesia. On examination a persistently tender gall bladder was found which did not function normally, as was shown by the Graham-Cole test. At operation the gall bladder showed a definite chronic cholecystitis with a moderate secondary hepatitis in the vicinity of the gall bladder. The gall bladder was removed with the desired effect. Today he feels better than he has felt for years.

Of the local complications, hepatitis is the most frequent and probably of the greatest significance. Charcot was the first to call attention to the constancy of liver involvement with gall stone. Charcot's observations were post mortem and depended upon a group of patients which we would now classify as neglected. As has been pointed out, especially by Graham, a considerable proportion of the patients that we operate upon have more or less involvement of the liver in the immediate vicinity of the gall bladder. In some cases this may be very extreme. I recently operated upon one patient in which there was an area approximately 10 cm. in diameter on the superior surface of the liver adjacent to the gall bladder, in which the superficial liver substance had been so completely replaced with scar tissue that there was no liver substance visible.

Graham (16, 17, 18) has shown that hepatitis is practically always present in chronic cholecystitis. He is of the opinion, however, that cholecystitis is secondary to hepatitis. If this be true, it is difficult to understand why the most marked hepatitis is usually found in patients with long standing cholecystitis. It is also difficult to understand why, if Graham's contention is correct, the liver improves after cholecystectomy. Were the cholecystitis the effect of hepatitis the removal of the effect would not have so marked beneficial results

upon the cause, but if the hepatitis is secondary to cholecystitis then the removal of cholecysitis should be followed by relief, and such is the case.

In 1909 (1, 2, 3) I reported experimental work that I had done on rabbits in which I showed that when the bacillus pyocyaneus was injected into the blood stream it could be recovered from the gall bladder in a very short time if the cystic artery was not ligated, but if the cystic artery was ligated it was not recovered. I further showed that if the organism was injected into the portal vein they would not be recovered from the gall bladder if the cystic artery was ligated but would be if the cystic artery was left open. The organisms lodging in the liver did not reach the gall bladder through the bile stream but they did reach the liver by going through the blood stream and returning through the cystic artery. Considering what was learned in the experimental work and clinical observation, I am convinced that hepatitis is usually secondary to cholecystitis, but I do not deny the occasional occurrence of gall bladder infection secondary to hepatitis.

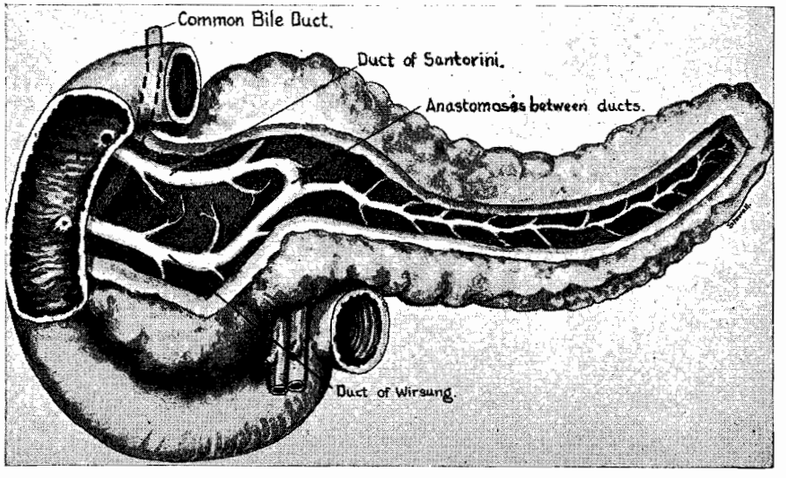

Figure No. 4

The relationship of pancreatitis to cholecystitis has been discussed rather extensively in the literature. The method by which this infection takes place has been under dispute. Lanceraux (9) in 1899 suggested the possibility of bile regurgitation due to the lodging of a stone in the ampulla of Vater. Opie (13) in 1901 reported a case of acute pancreatitis produced in this manner. Archibald (14) is a strong adherent to this theory. I have reported the findings of the obstruction at the ampulla and the development of a collateral branch between the ducts of Wirsung and of Santorini so that practically all the bile passed through a circuit route in the pancreas in order to be discharged into the duodenum (Fig. 4). Mann (8) and Giordano (10) have shown, however, that in a considerable percentage the relationship is such that regurgitation of bile into the pancreas is impossible. Klippel (11 and 12) in 1899 suggested the lymphatic route as a method by which infection from the biliary apparatus reached the pancreas. This was supported by Mangeret, Arnsberger, Deaver, Sweet (15) and others. Komado, however, has recently shown that normally there is no direct connection between the lymphatics of the pancreas and those of the gall bladder. This does not exclude the lymphatic route, however, as with the obstruction of lymph channels new channels develop. In all probability infection of the gall bladder reaches the pancreas, both through bile regurgitation and lymphatic extension.

Pancreatitis secondary to gall bladder disease may be either acute or chronic. The acute form is the least common, but the most serious. With early operation it gives a good prognosis. I have seen four cases, all of whom were operated upon early, and they all recovered. The operation consists of the removal of the gall bladder, drainage of the common duct, and placing of drains about the head of the pancreas.

Chronic pancreatitis is manifest by a thickening of the head of the pancreas and extension from there into the body of the pancreas. The clinical manifestations depend upon the amount of involvement. Disturbance of sugar metabolism is most frequent but incomplete fat digestion often occurs and may be the cause of persistent symptoms, as pointed out in a previous paper (8).

Local peritonitis of varying degrees usually accompanies acute cholecystitis and frequently accompanies chronic cholecystitis. This may be manifest by the formation of adhesions between the gall bladder and surrounding viscera and occasionally walled-off abscesses. General peritonitis may be the result of perforation or the extension of organisms through the gall bladder wall.

The diagnosis of hepatitis complicating gall bladder disease is more frequently made at operation than before. The history of a long standing cholecystitis and presence of tenderness over an area along the liver border greater than that of the gall bladder is suggestive of hepatitis. The palpation of an enlarged pancreas or the finding of sugar in the urine in small quantities in a patient giving a history of long standing gall bladder disease indicates chronic pancreatitis. General peritonitis developing in a patient having actual gall bladder symptoms is very suggestive of perforation.

The prevention of the complications is a very important part in

the treatment of gall bladder disease. Only a comparatively few patients with gall bladder disease die of the disease primarily, but nearly all patients having gall bladder disease over a long period of time develop complications. The only way to prevent the development of complications is by the early eradication of the disease, which usually means cholecystectomy. We must not advise patients having definite evidence of gall bladder disease, but without any severe manifestations, such as biliary colic or recurrent acute or subacute cholecystitis, that they can go about without danger if we are to prevent these complications. The time to operate upon chronic gall bladder disease is when the diagnosis is made or strongly suspected.

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