ISOLATED ABSCESS OF THE LIVER COMPLICATING APPENDICITIS

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The liver complications of appendicitis range from a banal icterus to acute yellow atrophy. It is probable that the functions of the liver are perturbed in every case of appendicitis. Credit must be given to the French clinicians for appreciating the importance and variety of these complications. Dieulafoy's term, La foie appendicularie, expresses a conception of a relationship between inflammations of the appendix and the liver which has received but scant attention in America. The most important and best recognized hepatic complication of appendicitis is liver abscess. Reginald Fitz in his notable contribution to the subject of appendicitis discussed this complication. We now know that in the non-tropical countries appendicitis is the most common cause of hepatic abscess.

The classical description of appendicular hepatic abscess presents the picture of a condition with a fulminating symptomatology and a fatal termination. Most authors have accepted the teaching of Dieulafoy who, in his "Leçons Clinique," said that hepatic abscess secondary to appendicitis is always fatal. When Loison, in 1900, reported a case with recovery to the Paris Society of Surgery, Poirier and Tuffier questioned the diagnosis. Gerster speaks of the "utter hopelessness of the malady." Deaver states that he has never seen recovery occur. In 1912 Franke remarked that one can almost say that these pylephlebitic abscesses have an absolutely unfavorable prognosis "because they are always multiple." In May of the present year Lissner wrote: "Surgical interference, however thorough, will not save the patient when once the infection has reached the portal vein."

A patient of mine with appendicitis developed an hepatic abscess without exhibiting any grave symptoms and he completely recovered from his malady. The history is as follows:

A. M. D., a male, aged forty, and a carpenter-contractor by occupation, had a negative family history. He was ill four weeks in 1909 with what was diagnosed typhoid fever. He had a second attack of the same disease in 1913 that lasted nine weeks. He
was a heavy whiskey drinker, otherwise his previous personal history was uninteresting. On March 17, 1916, he developed severe colicky pains in the abdomen accompanied by vomiting. There was no recollection of localized pain. He continued working. March 23, he had another severe attack of abdominal pain and vomiting. On the night of March 24, he was awakened by excruciating, griping, abdominal pains that radiated to the penis. Vomiting occurred. Dr. C. M. Glock was called, and a diagnosis of appendicitis was made. Patient entered St. Joseph's Hospital on the morning of March 25. When I examined him at the hospital he presented the following symptoms: Temperature 100.2° F.; pulse-rate 86; rigidity of right lower abdominal quadrant; tenderness over appendix; moderate distention. He had a slight cough and some expectoration.

Operation.—Right rectus incision. Small amount of pus, well localized, was sponged out and a partly necrotic appendix removed. The appendix was adherent and directed downward and inward; its removal was fairly difficult. Split-rubber drain inserted.

March 28: Temperature normal. Drain removed. Considerable cough and expectoration. For the next two weeks the history was uneventful; the drainage which had a fecal odor steadily diminished in amount. Cough and expectoration continued.

April 13: Temperature 101.4°; pulse-rate 90. Complained of vague distress in lower part of right chest. Dressing presented a small amount of brownish discharge. During the following three weeks the evening temperature varied from 101° to 103°, and the pulse-rate ranged from 80 to 96. Wound healed completely and patient insisted on moving about his room. At times he complained of dull pains and distress in hepatic region. Râles were detected over the base of the right lung.

April 21: He presented a slight general jaundice; the right lobe of the liver was palpable and tender two fingers-breadth below the costal arch.

April 22: A blood examination showed 12,300 white blood-cells with 74 per cent. of polymorphonuclears. Urine contained biliary pigments, otherwise normal. Fæces negative. Liver continued to enlarge until the right lobe was palpable a hand’s breadth below the costal arch.

May 4: A tender fluctuating swelling was detected over the lower border of the liver.

May 5: Under ether anaesthesia an incision was made over the swelling and a large quantity of greenish-yellow pus welled forth. An opening into the liver that admitted the index finger was
revealed. An effort to examine the abscess cavity in the liver was checked because of the profuse hemorrhage that resulted. Large tubular drain was inserted into the abscess cavity. Patient made an uneventful recovery. Discharged from hospital May 25, with wounds all healed and liver palpable about two fingers-breadth below the costal arch.

Before the onset of jaundice and enlargement of the liver I believed that his complications were pulmonary. Later, owing to the mildness of his symptoms, his alcoholic history and my own ignorance of the type of liver abscess under consideration, I was inclined to make a diagnosis of an acute hepatic cirrhosis.

This case is not unique and its history is fairly typical of solitary abscess of the liver of appendicular origin. In 1911 E. Quénu and P. Mathieu reported a similar case and wrote that they had searched the literature and, including their own and two unpublished cases of Jalaguier, they had records of fourteen cases with operation, twelve of which recovered and two died of other complications. Three of the fourteen cases, however, probably had subphrenic and not hepatic abscesses. These authors did not exhaust the literature for they did not mention Parker Syms, Emanuel Herzel (Gerster), Munro, Sheen and Morton (Thompson), Hermes, Delangeniere (Abbadie), Elsberg, Perman (Carlson), Makrowski, Bidwell and Mgaloblishwli (Walter-Sallis), each of whom is to be credited with one operative recovery, nor J. Jason Clarke who reported two cases with recovery. Since 1911 Bittner, Brogden, Le Petit, Franke and Kelly have reported recoveries after operation.

In order to understand the pathogenesis of this affection one has but to recall that the appendix is richly supplied by veins and that blood from the appendiceal region pours directly into the liver. Practically it is impossible to separate this subject from that of pylephlebitis. Thrombophlebitis is an ordinary event in the course of inflammations of the appendix. There is nothing peculiar about the formation and character of these thrombi. In very rare instances a thrombus may form and extend through the portal vein, causing an abscess of the liver by direct continuity. Thompson, however, described a case in which there was no abscess of the liver although the branches of the portal vein in the liver substance were filled with pus. The commonest occurrence is for small septic emboli to become detached from a thrombus in the immediate neighborhood of the inflamed appendix and to travel through the superior mesenteric and portal veins to the liver. Usually such emboli are abundant and highly septic, so wide-
spread abscesses of the liver and death of the patient result. This is the classical hepatic complication of appendicitis. But, as in dysentery, a single embolus may be transported to the liver and a solitary abscess develop. Or, as Quénu and Mathieu have insisted, an aseptic embolus may reach the liver and produce a focus of necrosis which is capable of being infected in the course of a bacillæmia. In Jalaguier’s case a syphilitic gumma played the rôle of a locus minoris resistentiae and was infected during the course of an appendicitis. Loison showed that emboli can go from the region of the appendix to the liver without causing visible changes in the veins.

The abscesses of the liver usually occupy the right lobe. This is due chiefly to the distribution of the branches of the portal vein. Sérgé (Quénu and Mathieu) seems to have proved by means of injections of Chinese ink that there are two currents of blood in the portal vein; one from the superior mesenteric, which goes to the right lobe, and one from the inferior mesenteric and splenic, which flows to the left lobe. It should be noted, however, that the left lobe alone may harbor the abscess.

We must admit that occasionally the infection travels to the liver along other avenues than the portal vein. It is possible that in rare instances infection takes place by way of the lymphatics. Munro has pointed out that the hepatic infections are not uncommonly associated with a lymphangitis, although the latter is not the source of the abscess in the liver. Koerte and others have believed that in certain cases the infection had journeyed to the liver along the retocolic area. Out of eighteen cases studied in the Lund-Malonêer clinics (Petrén) it seemed that in one the infection had travelled along the retrocecal way. Retocolic infections are more likely to result in subphrenic abscesses. It must be a rare event for a subphrenic abscess to result in an hepatic abscess, but it is not so rare for subphrenic abscesses to result from hepatic abscesses. We have already considered the possibility of a bacillæmia causing an hepatic infection; however, when the infection takes place by way of the arteries it is usually but one of the manifestations of a general pyæmia.

In typical cases symptoms of these localized suppurations are quite unlike those of multiple liver abscesses. The onset of the latter is with chills followed by a rapid rise of temperature and grave general symptoms. The former starts less abruptly and usually does not display anything characteristic in its symptomatology. After a variable period an appendicitis patient presents some rise in temperature; jaun-
dice, hepatic pain and tenderness and some increase in the size of the liver may be present. Quénu and Mathieu have emphasized the occurrence of a free interval when the temperature may return to normal, the appendix signs clear up, but the general condition remains unsatisfactory; finally the liver signs suddenly appear and the diagnosis is made. Unfortunately, many cases are not typical in their symptomatology and I cannot agree with the opinion of Quénu and Mathieu that the surgeon should be able to distinguish between these different types of hepatic suppuration. One can draw no positive conclusions from the time of onset or the latent period, the only certain method of differentiating is to open the abdomen and examine the liver.

Loison utilized the X-ray in making his diagnosis; various writers have conceded the diagnostic value of a Röntgen examination, but they do not seem to have employed it in their own cases. Exploratory puncture is generally condemned by American surgeons, although Koerte, Clarke, Kelly and others have resorted to this procedure in making the diagnosis.

When a solitary liver abscess complicates appendicitis, it is fair for us to assume that we are dealing with a mild infection. It is also reasonable for us to believe that any damage to the liver parenchyma would predispose to the occurrence of such an abscess. Jalaguier's patient with a gumma illustrates this point. Chloroform anaesthesia, which has a particularly injurious action on the liver substance, and alcohol must be regarded as predisposing factors. Walter-Sallis cannot accept the idea that the infection is facilitated by alcoholism, but Petrén showed that four-fifths of the appendicitis patients who develop liver abscesses are males and he quotes LeGrand as proving that alcohol is a prime factor in the cause of amœbic abscess of the liver.

The case reports and the autopsy records, especially those studied by Loison, indicate that in the majority of instances the abscess is situated superficially on the convex surface of the liver.

Munro writes: ‘The age at which these infections take place is limited mostly to young adults. According to statistics of Musser and others, children below fifteen are quite exempt from portal infections.” Petrén’s statistics clearly show that appendicitis patients between the ages of thirty and fifty are most liable to develop liver abscesses. It is a striking fact that proportionately a very large percentage of children have developed the isolated abscesses. Clarke's patients were both boys of less than nine years of age.

Early operations have made hepatic abscess a very infrequent sequel
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of appendicitis. Babler states: "Murphy maintains that multiple abscess of the liver are a rare complication of appendicitis. Oschner, Deaver and several other prominent American surgeons have not seen more than one case." Recently Stillman discussed the post-operative sequelae in 1748 cases of appendicitis; 124, or about 7 per cent., had sequelae and of these 2 cases presented liver abscesses. The solitary forms constitute but a very small percentage of the total number of liver abscesses; however, their rarity does not excuse the surgeon if he fails to consider them when his appendicitis patients present an unexplained rise of temperature.

Eminent pathologists have taught that resorption of liver abscesses occurs. Munro held that the spontaneous healing of the liver abscesses which complicate appendicitis is not impossible. Hellström, in his admirable "Arbeit," proves that spontaneous resorption, even of the multiple abscesses, has occurred.

The treatment is purely operative. The conduct of the operation is the same as for hepatic suppurations of a different etiology; so far as recoveries are concerned the honors are equally divided between the transpleural and the abdominal routes. If one suspects an intrahepatic collection of pus which cannot be localized the liver should be exposed by a large abdominal incision and carefully explored. Wilms is given credit by the European writers for advising the ligation and ablation of the mesenteric veins leading from the infected area, but Gerster first advised and practised this procedure; however, it is probably without value.

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