A case of deep-seated tropical abscess of the liver treated by trans-thoracic hepatotomy : recovery / by Byrom Bramwell and Harold J. Stiles.

(12.)

A CASE OF DEEP-SEATED

TROPICAL ABSCESS OF THE LIVER

TREATED BY TRANS-THORACIC HEPATOTOMY; RECOVERY.

BY

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A CASE OF DEEP-SEATED TROPICAL ABSCESS OF THE LIVER TREATED BY TRANS-THORACIC HEPATOTOMY; RECOVERY.

THE MEDICAL HISTORY OF THE CASE AND DIAGNOSIS BY DR. BYROM BRAMWELL.

A STRONG, muscular man aged twenty-eight years was seen with Dr. Curtis Whyte of Dalkeith and Dr. T. W. Dewar on Oct. 8th, 1895. The patient stated that he had enjoyed perfect health until about six years ago, when he suffered from a rather severe attack of gonorrhœal arthritis affecting especially the knee, both ankles, and the toes. During this illness he was confined to bed for nearly a month and was afterwards treated for some weeks at Buxton. The following spring he again suffered from rheumatism in both ankles and was again treated at Buxton. The rheumatism then gradually left him and he had been free from it ever since. In June, 1894, he went to Lagos on the West Coast of Africa. He described Lagos as a flat, swampy, stinking, fever-breeding place, with no safer water-supply than the rain collected from the roofs of the houses. A month after reaching the colony he was seized with fever of a malarial type; the febrile attacks recurred at longer or shorter intervals, and usually lasted for two or three days at a time. In April of the following year (1895) he was seized with a severe attack of dysentery. This necessitated his removal to hospital, where he remained three weeks. From hospital he was conveyed directly to the ship which brought him home. He derived great benefit from the voyage and stated that on his arrival in this country in June, 1895, he was perfectly well. He remained in good health until the end of August, when while away from home on a holiday he was attacked with severe dysenteric diarrhœa. He returned home looking and feeling ill. He was seen by Dr. Whyte on Sept. 4th. The diarrhœa soon yielded to

treatment, but some days afterwards he began to complain of intermittent pains in the right shoulder and of a catching pain in the right hypochondriac region at a point corresponding to the junction of the sixth and seventh right costal cartilages with the sternum. The pain in the hypochondriac region was increased by taking a long breath, laughing, or yawning. It was so much aggravated by laughing that he was obliged to quit the room whenever there was any joking going on. This pain continued notwithstanding treatment. On the evening of Sept. 20th he was seized with a chill while out walking and on his return home he had a distinct rigor. The temperature ran up to 103°. F. The rigor was followed by profuse perspiration. He was now kept in bed and placed on quinine—five grains four times daily. But as the febrile disturbance persisted in spite of the quinine, and as the patient complained on several occasions during the next fortnight of slight chilliness not amounting to distinct rigors, Dr. Whyte and Dr. Dewar began to suspect that he was probably suffering from an abscess of the liver, although no local signs of such a condition were discoverable. During this period night sweats were frequent; the temperature always ran up to 101° or 101·5° at night, but was usually normal in the morning; the appetite became poor, but the tongue remained clean; there was some loss of flesh. On Oct. 8th I was asked to see the patient in consultation with Dr. Whyte and Dr. Dewar. The most careful examination failed to detect any physical evidence of local disease. The abdominal and thoracic organs all appeared to be normal. The liver was not enlarged and there was no localised tenderness even on firm pressure over any part of the organ. The pulse frequency was only slightly increased; the respirations numbered 16 per minute; the temperature at the time of my visit was slightly below the normal; the tongue was clean, the appetite was poor, and the bowels were regular. The patient had, since his illness commenced, got a little thinner, but there was certainly no emaciation. The evening temperature had for some weeks previously been distinctly elevated; there had been several attacks of chilliness, followed by sweating and one definite rigor. Notwithstanding the absence of any enlargement of the liver and of any tenderness on pressure over the organ I agreed with Dr. Whyte and Dr. Dewar in thinking that the patient was in all probability suffering from an abscess of the liver. This opinion was based on the following line of argument: (1) that the patient was

suffering from fever of a hectic type, gradual and progressive emaciation, and occasional attacks of chilliness, hardly amounting to distinct rigors ; (2) that the febrile disturbance was irregular in type (in other words, not distinctly malarial), that it was uninfluenced by quinine, and that there was no definite enlargement of the spleen ; (3) that the patient had suffered from severe tropical dysentery ; (4) that the patient complained of pain in the right shoulder and of a catching pain in the right hypochondriac region at the junction of the sixth and seventh costal cartilages with the sternum ; (5) that the most careful examination failed to detect any evidence of disease in the lungs, heart, or any other organ capable of accounting for the symptoms ; and (6) that there was nothing either in the personal condition of the patient, his previous state of health, or the family history suggestive of tubercle, acute tuberculosis being one of the conditions which was naturally thought of as a possible cause of the symptoms. For the reasons given above I concluded :—Firstly, that the febrile disturbance was not due to malaria, to tubercle, or to ulcerative endocarditis ; further, there was no suspicion of typhoid fever. Secondly, that it was apparently due to some internal suppuration ; and thirdly, since there was no discoverable local lesion in any other organ (negative evidence), and because (*a*) of the very definite history of dysentery, and (*b*) of the presence of pain in the right shoulder and right hypochondrium (positive evidence), that, notwithstanding the absence of any positive enlargement of the liver, the internal suppuration, which we believed to be present and to be the cause of the fever, was in all probability situated in the liver. Believing, then, that the case was one of hepatic abscess we decided that if the symptoms did not subside after further treatment with still larger doses of quinine the liver should be explored by diagnostic puncture with the object of endeavouring to localise the pus. On Oct. 23rd, as no improvement had resulted, Mr. Stiles was asked to see the case. He agreed with the diagnosis but considered it advisable to wait for further indications of the position of the supposed abscess before proceeding to operative interference. On Oct. 30th another consultation was held, Dr. Whyte, Dr. Dewar, Dr. Bramwell, and Mr. Stiles being present. The patient was evidently losing ground ; his expression was indicative of languor and debility ; his features were somewhat pinched and shrunken ; he was thinner ; the fever was higher, and although there was no jaundice he exhibited in

some degree the sallow, earthy, complexion which is frequently observed in patients suffering from hepatic abscess. He complained of a dull, ill-defined pain and sense of weight over the right hypochondrium; of attacks of chilliness, amounting almost to rigors; and of profuse perspirations, especially during sleep. He preferred a dorsal decubitus, but it could not be said that lying upon his left side gave rise to any additional discomfort. The temperature chart during the previous fortnight showed a distinctly hectic type of fever, the evening rise ranging from 102° to 103°, with a morning fall to between 99° and 100°. The tongue was moist, with a white fur on the dorsum and red edges. The appetite was markedly impaired, but there had never been any vomiting. The bowels were normal. The urine was highly coloured and loaded with urates, but otherwise normal. The abdomen was flat and flaccid. The epigastrium was, if anything, a little hollowed out; its two halves were perfectly symmetrical and moved equally with respiration. The muscles attached to the right costal margin were free from any rigidity. Two of the gentlemen who took part in the consultation thought that there was just a suspicion of greater fulness on the right side opposite the seventh, eighth, and ninth ribs in the mid-axillary line, but the alteration, if any, was so very slight (and two of us were not satisfied that it actually did exist) that little or no significance could be attached to it. The intercostal spaces over the region of the liver were quite distinct and there was no trace of subcutaneous œdema. The patient was unable to refer to any distinct local pain further than a sense of weight and aching over the whole of the right hypochondrium and of a catching pain on taking a deep breath at the junction of the sixth and seventh right costal cartilages with the sternum. There was no local tenderness; indeed, the ribs and interspaces could be very firmly pressed upon without causing any discomfort. There was certainly no enlargement of the liver in a downward direction, and percussion failed to show any evidence of a dome-shaped enlargement upwards. There was no cough. The lungs appeared to be quite healthy. At the extreme base of the right lung in the posterior axillary line a very faint friction rub (probably sub-diaphragmatic) was heard over a very localised area about the size of a five-shilling piece. There was no enlargement of the spleen. The heart was quite normal. Rectal examination was entirely negative. The general condition was less satisfactory than it was when I had last seen the patient a fort-

night previously. I saw no reason to modify my previous conclusion that the cause of the febrile disturbance was in all probability suppurative hepatitis, and that the pus was probably deeply seated in the upper and back part of the right lobe. The very localised friction rub over the base of the right lung, which was the only physical sign indicative of disease, seemed to support this opinion, which was concurred in by all the gentlemen who were present at the consultation, and was communicated to the patient's relatives. The question of immediate exploratory puncture was again debated, and it was decided to wait for a few days longer with the object of seeing if any further symptoms or signs indicative of the position of the supposed abscess would develop; and then, whether such development took place or not, that the operation of exploratory puncture should be performed.

The Surgical Treatment of the Case and Remarks by Mr. Stiles.

On Nov. 7th I was sent for to see the patient again. He had had a bad night in consequence of having been seized with a lancinating pain localised to the seventh interspace in the mid-axillary line. The evening temperature during the previous week had risen to between 103° and 104° F., and on one occasion reached 104·6°; there had been no distinct rigors, but the night sweats were more profuse. As the temperature had gradually been getting higher and the patient slowly but surely losing ground it was decided to explore the liver for pus, notwithstanding the absence of any enlargement. A medium-sized trocar and cannula belonging to the ordinary Potain's aspirator was pushed into the liver in the mid-axillary line through the seventh intercostal space; this situation was selected, firstly, because from it the upper and back part of the right lobe could be most readily reached, and, secondly, because it was the seat of the sharp localised pain of which the patient complained. Pus was reached after the trocar had penetrated for a distance of about two and a half inches from the surface, a slight resistance being encountered as the wall of the abscess was pierced. About a tablespoonful of brick-red pus, strongly suggestive of anchovy sauce, was removed and received into a sterilised bottle. It was found that the cannula could be pushed up to the hilt without meeting with any resistance,

thus proving that the abscess was of considerable size. The pus, which was without odour, was carefully examined microscopically for organisms, but none could be discovered. Gelatin and agar-agar tubes were inoculated and remained sterile. In view of the fact that amœbæ have been found in such abscesses by Lösch, Kartulis, Koch, Osler, Councillman and Lafleur, Galloway, and others, many films were specially stained for them, but with a negative result. The "pus" consisted chiefly of granular detritus, fragments of chromatin, pigment granules, and a few red and white blood-corpuscles.

On Nov. 9th, assisted by Mr. Ernest Fortune, I performed the following operation. The skin having been pulled downwards, an incision four inches in length, and commencing in the mid-axillary line, was carried obliquely downwards and forwards over the eighth rib and a portion of the latter, two and a quarter inches in length, was excised subperiosteally. The upper edge of the wound was then retracted and a corresponding portion of the seventh rib was excised, also subperiosteally. With an aneurysm needle a cat-gut ligature was tied round the extremities of each of the periosteal troughs which remained, thus securing the intercostal vessels. The periosteum which intervened between the ligatures was then removed, as were also the adjacent intercostal muscles and a digitation of the serratus magnus. In this way an area of costal pleura about two inches square was exposed, an endeavour having been made not to wound the pleura in dissecting the above mentioned structures from off it. It was found, however, that a small opening had been made into the pleura in dividing one of the ribs, the result being that a small quantity of air could be heard to enter the chest with each inspiration. The general cavity of the pleura was next shut off by the introduction of a circle of interrupted and overlapping catgut sutures, according to the method recommended by Mr Godlee,[1] but deeply enough to penetrate, not only the costal and diaphragmatic pleura, but the whole thickness of the diaphragm along with the capsule of the liver. A crucial incision was then made through the costal pleura within the area enclosed by the sutures, and the diaphragm, covered by its pleura, was exposed. The diaphragm was then incised parallel to its fibres and—as was anticipated from the slightly thickened and opaque condition of its pleura—was found to be adherent to the liver. As, how-

[1] Brit. Med. Jour., Oct. 22nd, 1887.

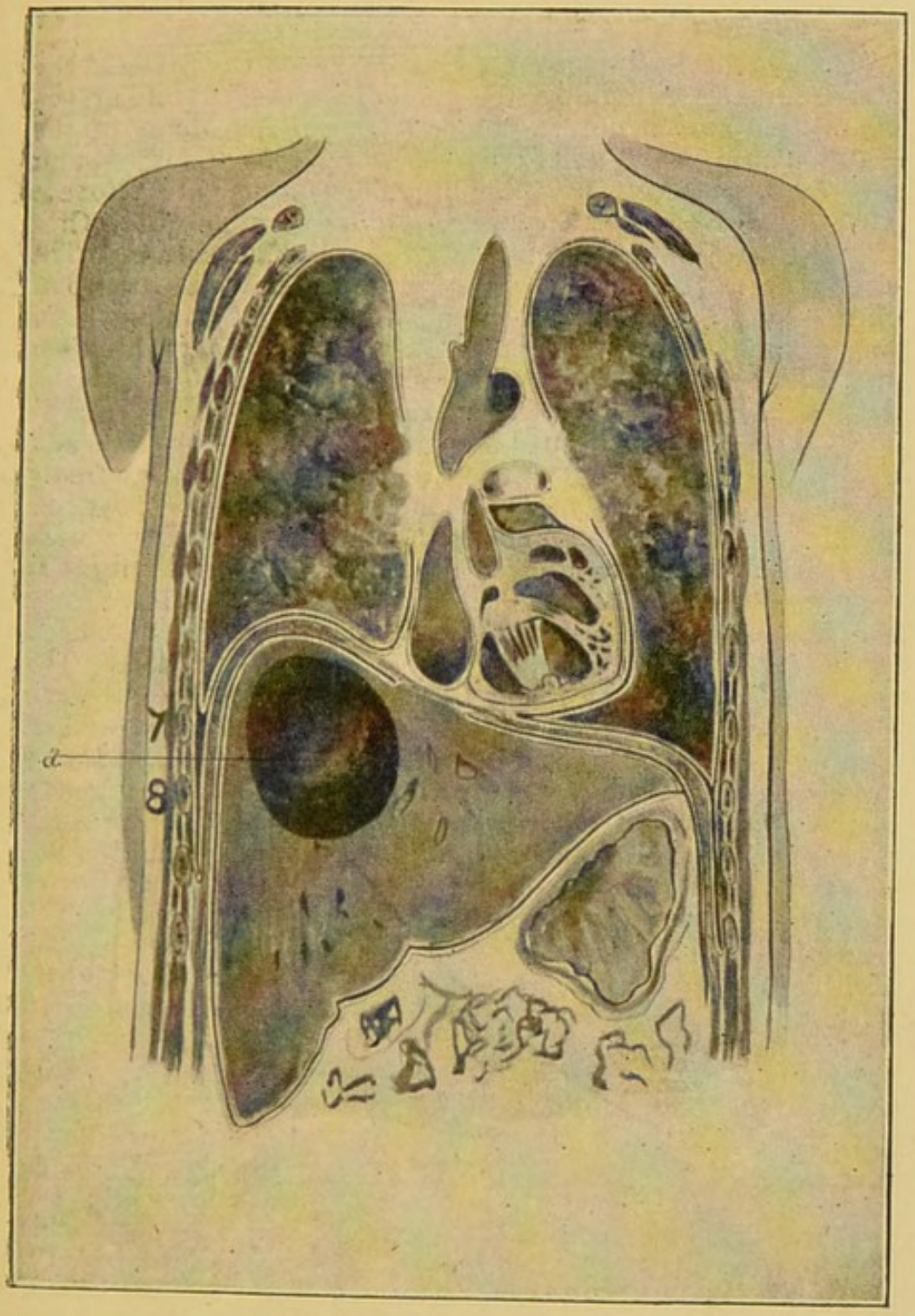

Diagram (constructed from Plate XIII. of Professor Symington's "Topographical Anatomy of the Child") showing (*a*) the position of the abscess and its relation to the parts concerned in the operation—viz., the lower border of the lung, the pleural cavity, the diaphragm, and the peritoneal cavity. The figures 7 and 8 indicate the seventh and eighth rib respectively.

ever, the adhesions were recent and allowed the fibres of the diaphragm to be readily separated from the capsule of the liver these two structures, along with the four doors of the costal pleura, were united by a second continuous circular suture placed within the interrupted ones already mentioned. An area of liver about the size of a half-crown piece was thus exposed within the second or inner circular suture. The circumference of the wound was then packed with a strip of gauze, and the largest trocar and cannula of the aspirator was pushed backwards and slightly upwards into the liver and the abscess reached at a distance of about one inch from its surface. With the cannula retained in position to act as a guide a knife was pushed alongside it into the abscess, and the opening dilated by a pair of dressing forceps so as to freely admit the finger. There was no hæmorrhage to speak of. Before allowing the contents to escape the finger was used to ascertain the size and nature of the abscess cavity. It was found that we had to deal with one large cavity, nearly the size of a child's head, situated in the upper and back part of the right lobe, the commonest situation. The finger was unable to reach the limits of the abscess until the greater part of the contents had been allowed to escape. The wall of the abscess was soft and friable. There were no diverticula. The pus, which had the appearance already described, was of a mucoid consistency and contained much débris and soft pulpy necrotic masses. After evacuating the contents the cavity was flushed out with a large quantity of sterilised water, which brought away a further quantity of necrotic tissue. The cavity was drained by means of a Keith's glass tube, three inches long, and fitting tightly within a flanged rubber tube long enough to project for an inch or so beyond the glass. In this way collapse of the tube was prevented, while at the same time the risk of its extremity pressing injuriously upon the wall of the abscess was avoided. The wound was stuffed with iodoform gauze and partly closed by a couple of sutures introduced at each extremity. On Nov. 10th the patient had slept well; the temperature was normal, the pulse 66, and the respiration 26; the sweating was much less. He complained of pain when he tried to move the arm. On the 11th he looked much brighter, having already lost to a great extent the earthy and pinched appearance. The pulse and temperature were normal and he was more inclined for food. The dressing was soaked with a considerable quantity of dark red muco-pus which was almost gelatinous in consistence. On

the 13th he had been perspiring more freely; the temperature was 101°, the pulse 80, and the respiration 28. The wound was dressed, the tube being found to be blocked with gelatinous-looking necrotic masses. There was retention of two or three ounces of muco-pus, which accounted, no doubt, for the elevation of the temperature. The iodoform gauze stuffing was removed and renewed. A probe was passed for five inches before striking the further side of the abscess. On the 15th the temperature had been normal since the last dressing. The discharge was copious and continued to be of the same character. The appetite was much improved and he could move the arm more freely. On the 17th the discharge was of the same character, but less in quantity. On the 21st he complained of pain in the right side, which had been present since the previous night. This was found to be due to the pressure of the flanged edge of the glass tube which then passed very obliquely upwards and backwards. Œsophageal tubing was substituted for the glass tube. On the 24th no pain had occurred since the tube had been changed. The discharge was then very scanty and had quite altered its character, being ordinary or laudable pus, such as one would expect to come from an abscess cavity lined by healthy granulation tissue. The unhealthy necrotic lining had evidently been completely cast off. The probe passed very obliquely upwards for about three inches; from its direction it was evident that contraction was taking place mainly from below, in consequence, no doubt, of the upward pressure exerted by the abdominal contents. A smaller and shorter tube was introduced, and on the 29th this was removed and the sinus, only one and a half inches in length, stuffed with iodoform worsted. The further progress need not be detailed; suffice it to say that the patient rapidly gained in weight and strength, so that by the end of the fourth week he was able to be out of bed, and three weeks later he was going about out of doors with the wound completely healed. On Jan. 2nd, 1896, physical examination showed that the liver was very considerably diminished in volume; the relative dulness in the mammary line commenced at the upper border of the fifth rib, and became absolute at the sixth interspace; the lower edge did not quite reach the costal margin, and light percussion gave a stomach note over the entire costal angle right up to the sternum. On the right side, below the angle of the scapula, and in the lower axilla, the lung note was somewhat impaired and ceased altogether two fingers' breadth above that on the left side.

The breath sounds over this area were feeble, otherwise they were normal. There was no friction. There was some falling in of the chest wall on the right side opposite the seventh, eighth, and ninth ribs, but the expansion of the chest was equally good on the two sides. The patient was seen again a few weeks ago and appeared to be in perfect health; he had gained two stones in weight since the operation, and was in the habit of taking a great deal of exercise; his digestion left nothing to be complained of. The cicatrix was somewhat depressed and became drawn in during inspiration. The physical signs were much the same as they were five months ago. The whole of the costal angle was still free from liver dulness, but the breath sounds at the base of the right lung were more distinct and could be heard almost down to the same level as on the left side.

Remarks by Mr. STILES. — In reviewing this case from the surgical aspect there are one or two points to which further allusion may be made. Although the history, the discomfort in the hepatic region, the constitutional symptoms, and the healthy condition of the other organs all pointed to suppurative hepatitis, it nevertheless remained for the aspirator to establish the diagnosis, to determine the situation and size of the abscess, and to decide as to the nature of the operation which would be required to be performed. If pus be present in the liver without giving rise to any external manifestations, then we must conclude that we have to deal either with small multiple abscesses or with a single abscess which, if of considerable size, will in all probability be situated either in the upper or the upper and back part of the right lobe. The question therefore arises as to the best site from which to make an exploratory puncture in order to reach the pus by the safest and most direct route. As the result of investigations in the post-mortem room I came to the conclusion that the seventh intercostal space in the mid or anterior axillary line should be the point first chosen, and the trocar passed either vertically to the surface, or with more or less inclination upwards and backwards. The lower part of the pleural cavity, if not obliterated by adhesions, will of course be traversed, but the lower edge of the lung will be above the puncture. Should this fail to strike the pus, further exploration should be made through the seventh space in the scapular line, and, if necessary, from the sixth and eighth spaces. If there be no downward enlargement of the liver,

the ninth space would be too low, and there would be considerable danger of the trocar entering the colon, the gall-bladder, or even the duodenum. The next question to consider is, having struck the pus, should the operation be at once proceeded with? I think not. A small quantity of pus should be withdrawn into a sterilised bottle and subjected to careful microscopic examination, and culture tubes should be inoculated. By this means the surgeon, within forty-eight hours, will gain information as to whether the abscess be sterile or whether organisms be present, and if the latter, their nature. In a large proportion of cases the pus in tropical abscesses of the liver has been found to be sterile. In other cases it has contained the amœba coli, either alone or in conjunction with the ordinary pus-forming organisms, or the latter only have been found. Should pyogenic organisms be discovered, then the subsequent operation must be performed in such a way as to prevent infection of the pleural and peritoneal cavities. This, of course, is best done by operating in two stages. The first operation consists in the exposure of the liver, the shutting off of the serous cavities by sutures, and the plugging of the wound to bring about adhesions; at the second, a few days later, the abscess is opened. If, however, the pus be sterile, as it very frequently is, then I see no reason why the abscess should not be opened at once, and the patient thereby relieved from the anxiety and shock of a second operation. Even although the pus be sterile, that should not prevent the operator from shutting off the pleural and peritoneal cavities as far as possible. To do this, portions of two ribs should be excised and a good large area of costal pleura exposed. Having excised the ribs, the soft parts (periosteum, intercostal muscles, and a digitation of the serratus magnus) should be dissected off the costal pleura, if possible, without wounding it, a step which will require considerable care when dealing with thin healthy pleura. From the reports of cases to which I have had access I find that the costal pleura has been incised before stitching it to the diaphragm. It appears to me that it is a much better plan to pass the sutures before incising the pleura; with the costal pleura freely exposed and stretched across the floor of the wound the suturing of its circumference to the diaphragm and liver is rendered simpler and more satisfactory than would be the case if the pleural cavity were first opened into. When the right lobe of the liver is the seat of an abscess, the diaphragm is pushed up into close contact with the costal pleura, so that with

a fully curved needle (a Hagedorn's and holder) a circle of interrupted and overlapping sutures may readily be introduced. Most surgeons, I observe, have introduced them merely into the diaphragm ; but seeing that we can never be certain whether the liver has become adherent to the diaphragm it is better to carry the sutures through the diaphragm into the capsule of the liver and in this way to shut off the pleural and peritoneal cavities at one and the same time. Another advantage of not incising the pleura until after the sutures have been introduced is that very little air enters the chest and complete and sudden collapse of the lung is thus prevented—a matter of some importance with the patient under the influence of an anæsthetic. In our own case air was sucked into the chest through a small accidental opening into the pleura as well as each time the pleura was punctured in the act of introducing the sutures. Dr. Whyte, who administered the anæsthetic, was unable to observe that this produced any effect upon the respiration. The same observation has been made when the pleura has been wounded in the act of removing a cervical rib. The inner continuous circular suture may, perhaps, not have been necessary ; as, however, the adhesions between the diaphragm and liver were of recent origin, it was thought safer to employ it ; in the absence of such adhesions it should certainly be used. Some surgeons take special precautions in order to diminish the amount of hæmorrhage resulting from the necessary incision into the liver to reach the abscess. Zancarol,[2] who has probably had the largest experience in the treatment of hepatic abscess, recommends that the cautery be used for this purpose. Edmunds,[3] having introduced a special trocar and cannula into the abscess, withdraws the former and substitutes for it a narrow, grooved director ; the cannula is then withdrawn and a long, wedge-shaped knife passed along the director into the abscess. Except in abscesses which are unusually deep-seated, the simple method of pushing the knife into it alongside an ordinary cannula left in position to act as guide and following up this with dressing forceps to dilate the opening sufficiently to introduce the finger, appears to be a perfectly safe procedure.

As regards the treatment of the abscess cavity, Fontan [4]

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[2] Traitement Chirurgical des Abscès du Foie des Pays Chauds. Paris : Steinheil, 1893.

[3] St. Thomas's Hospital Reports, vol. xxi., 1893, p. 205.

[4] Revue de Chirurgie, Février, 1892.

recommends that its wall be scraped and claims that by this means the healing process is hastened. In a large abscess of the liver, such as has been described, thorough douching followed by free drainage is simpler and gives perfectly satisfactory results and, moreover, is free from the risk of hæmorrhage or of opening into the biliary passages. The last point to which it is necessary to refer is one which has already been mentioned—namely, that cicatrisation of the abscess takes place chiefly from below. This is a point which should be borne in mind in considering the level at which the abscess should be opened, as it is evident that drainage will be better maintained if the abscess be opened at its upper, rather than at its lower part.

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