ON THE SURGERY OF THE LIVER AND GALL BLADDER.¹

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OPERATIONS on the liver, closely allied to present procedures, were performed many years ago, as shown by a paper on Hepatotomy, by Graves, in the *Dublin Hospital Reports*, so far back as 1827; and, according to Thudichum, cholecystotomy was performed so long ago as 1618, although to Petit is usually accorded the merit of having proposed the operation of biliary lithotomy, which was first done successfully by Dr. Bobbs in 1867.

There can be no doubt, however, that diseases of the liver and gall bladder have only quite recently come to be looked on as possessing surgical interest, and it is only since the greater perfection of surgical procedures that the physician has thought it worth his while to confer with a surgeon in this class of cases. As in a general discussion it is impossible to enter into the details of individual cases, I would take the opportunity of mentioning that my observations and conclusions are based on an experience of over seventy operations which I have myself undertaken on the liver or gall bladder, besides others which I have seen or have been immediately concerned in; to say nothing of the consultation cases where operation has either been declined or not advised. As my remarks are based in a great measure on this experience, I must ask your forbearance if they appear egotistical, although I will do my best to avoid laying myself open to the charge.

INJURIES AND DISEASES OF THE LIVER AMENABLE TO SURGICAL INTERFERENCE.

Injuries of the liver may occur from stab or gunshot wounds, or from rupture by great violence without external injury. These cases are often amenable to treatment by abdominal section with the view of arresting hæmorrhage, either by ligature of vessels, suturing together of bleeding surfaces, or plugging bleeding wounds where the hæmorrhage cannot otherwise be arrested. In gunshot injuries and in stab wounds surgical treatment holds out considerable chances of success; for example, Korte has reported two cases in which cure followed laparotomy. Dr. W. C. Dalton also reported before the St. Louis Medical Society a case of stab wound with excessive hæmorrhage, where the liver wound was plugged with iodoform gauze, which was removed at the end of forty-eight hours, when the abdomen was washed out and cleared of extravasated blood and clot, the patient making a good recovery. Other cases of recovery after direct injury both of the liver and gall bladder have also been reported. In some instances, however, the surgeon will be powerless, as the patient never sufficiently recovers from the shock to be able to bear an extensive operation. This is well shown by a case admitted to the Leeds Infirmary under my care in May last, where a man had fallen from a considerable height, breaking his arm, fracturing some ribs, and sustaining internal abdominal injuries, accompanied by hæmorrhage into the peritoneum—thought to be from ruptured liver. The catheter proved absence of bladder rupture, and the presence of liver dullness negatived rupture in the gastrointestinal tract, though the presence of fluid free in the abdomen, which the exploring syringe proved to be blood, showed internal hæmorrhage. The patient, however, was suffering from such profound shock that it was felt by myself and colleagues that he would die on the table if laparotomy was undertaken. Transfusion was tried, but produced only temporary improvement. A necropsy showed laceration of the pons hepatis and the abdomen full of blood. Here operation could have done no good.

Indications for surgical interference in injuries of the liver or gall bladder:—In penetrating wounds over the liver, laparotomy should be done as early as possible, so as to cleanse the wound, to arrest hæmorrhage, to repair injured

viscera, and to wash blood and extravasated fluids from the peritoneal cavity. Even if no visceral lesion be found, this treatment, with due precautions, will not add to the danger, but in many cases will be the means of averting death, as there are no constant symptoms which may be relied on to prove or disprove visceral injury. In internal injury without external wound and with signs of internal hæmorrhage, if the patient rallies from the shock sufficiently to warrant operation, abdominal section should be undertaken in order to arrest the bleeding, and to repair the lesion if possible.

Abscess of Liver.—That abscess of the liver is more common in England than many writers would lead one to suppose has not only been pointed out by Dr. Harley, but is also shown by the reports in the journals of numbers of cases operated on at home; for instance, no more instructive or important series than the twenty-four cases commented on by Mr. Godlee could be mentioned. The diagnosis of hepatic suppuration is essentially a surgical procedure; and although the symptoms and signs may lead to a suspicion of abscess, it is to the exploring syringe or the aspirator that one will have to resort to prove the presence and the situation of the pus. After pus is found, the sooner efficient drainage is obtained the better for the patient; and as a rule, when the liver is explored, the surgeon should be prepared to proceed to the major operation of hepatotomy at once or within a short time, for wherever pus is discovered in the liver, it can be reached by one or other method. If the abscess be pointing in the usual positions either at the epigastrium or over the lower ribs, a condition neither to be encouraged nor waited for, it may have contracted adhesions, and simply require a free incision and drainage. If there be no sign of pointing, but the liver be enlarged downwards and the abscess can be reached by an abdominal incision, the treatment is as a rule simple, as the area of operation can be made superficial by suturing the parietal and visceral layers of the peritoneum, together with a single row of silk sutures before the abscess is opened. This I have proved to be efficient on several occasions, the union being in one case sufficiently firm to withstand considerable manipulation in packing the wound for hæmorrhage from the abscess cavity.

This suturing of peritoneal surfaces, though advisable where possible, is not by any means absolutely necessary, so that where it cannot be easily accomplished it had better not be attempted, as it certainly involves some little time in doing, and this may be an important factor in the case. If preliminary sutures be not applied, the area of operation must be isolated by flat sponges, and after the abscess has been evacuated and the sponges removed, the edges of the sac must be sutured to the skin. In one case of abscess of the liver associated with gall stones, I found so much matting of the adjacent viscera, and the liver substance to be so friable, that I had to be content with thoroughly opening the abscess, washing it out, and packing with iodoform gauze, leaving the cavity in the liver widely open towards the peritoneum. No peritonitis ensued, the packing was changed twice daily, and an uninterrupted recovery followed. Once I packed a similar cavity with sponges, after thoroughly washing it out, the sponges being changed from time to time, and being left out after forty-eight hours, when a clean granulating cavity remained and healed kindly.

In one case, where I had cleared out an abscess in the right lobe of the liver just above the gall bladder, I used the right border of the omentum, with complete success, to shut out the general peritoneal cavity, stitching it to the parietal and visceral layers of the peritoneum like a veil, below the drainage tube. Where the abscess has to be approached through the thorax, either above or below the diaphragm, a little more difficulty is experienced, and the simple apparatus which I hand round will be found convenient if the pus be situated far from the surface, or the patient be too ill to bear a longer operation. It will be seen that it consists of a long trocar and a stretched drainage tube, the stretching being accomplished by a knitting needle and two small key barrels. The stretched tube is easily passed through the trocar as soon as the pus has flowed away, and on sliding the trocar over the tube the latter is left in the abscess cavity; the outer extremity of the knitting needle is then lifted out of its socket and the finger placed on it; the tube will then retract and

¹ Read in the Section of Surgery at the Annual Meeting of the British Medical Association held at Nottingham, July, 1892. It being a paper opening the discussion on Hepatic Surgery.

thoroughly fill up the trocar opening; the needle is then removed, and the outer end, including the key barrel, is cut off flush with the skin, the extremity being transfixed with a safety pin in order that it may not disappear. This saves time, avoids hæmorrhage, and fills the drainage opening in the liver, so preventing the escape of pus by the side of the tube before adhesions have had time to form. It seems to me to accomplish in a simple manner what is effected by Dr. Manson's very ingenious but somewhat complicated apparatus described in the *BRITISH MEDICAL JOURNAL* for June 23rd, 1892, and which he has employed with success on several occasions. If the calibre of the tube be large, and if it be made of thick rubber, it will answer the same purpose as the solid tubes recommended by Dr. Macleod in the *BRITISH MEDICAL JOURNAL* for December 26th, 1891.

If, however, time be no serious object, and if adhesions have not formed, then it is not difficult to suture the peritoneum of the liver to the diaphragm; and if the incision be through the pleural cavity the parietal and visceral pleuræ may be easily fixed by sutures by means of a needle in the handle. This is much easier than usually described, as the bulging liver pushes the diaphragm close to the chest wall, and, as a rule, it is unnecessary to excise any rib if the interspace be widened by a wedge or by retractors, but, if the intercostal space give too little room, subperiosteal resection of a portion of rib can be soon performed. When the pleura is opened, suture of the parietal and visceral layers is advisable, both on account of the movements of respiration tending to draw pus into the pleural cavity and because of the dyspnoea which may come on, owing to pulmonary collapse from pneumothorax. That this is not an imaginary difficulty is proved by a case which came under the care of one of my colleagues, who had to firmly pack the parietal wound in order to ease the distress of his patient.

The real secret of success in treating abscess of the liver is free drainage without obstruction of the external opening. After the abscess is opened it should be dealt with very gently, at most being syringed out with a solution of boracic acid until the fluid returns clear. The drainage tube had better be cut off flush with the skin, a safety-pin being pushed through it to prevent its slipping into the cavity. It should be gradually shortened as the discharge diminishes, and only left out when the formation of pus has practically ceased.

It is wise to fix the right side of the chest with strapping and to apply a bandage firmly over the dressings. The dressings I usually employ are the double cyanide gauze and salufer wool, and I need scarcely say that care is taken to follow out antiseptic methods and to thoroughly purify the skin wide of the wound. Adhesions cannot be relied on, and need not influence the decision to drain, as drainage can be done efficiently and well, though no adhesions be present.

The real difficulty in abscess of the liver lies in the diagnosis, which it would be interesting to discuss if time would permit.

Surgical interference seldom, or perhaps never, does any good in pyæmic abscesses, which are usually multiple and small, often associated with jaundice, with enlargement of the liver, and with typhoid symptoms. Although the prognosis in such cases is almost hopeless, I have operated, and should feel inclined to do so again, if I found a distinct collection of pus, and the patient's general condition warranted interference, just as I should open a pyæmic abscess elsewhere, in the hope that the relief afforded might give the patient a better chance of surmounting this and the other difficulties. In all other liver abscesses operation is urgently demanded, though in multiple abscesses it will often fail.

Aspiration may very occasionally succeed in effecting a cure but it should not be relied on except as a merely temporary measure, the value of the aspirator in these cases being for diagnosis and not for treatment. Where one abscess is opened and others are thought to be present, it is better, where possible, to push an exploring syringe through the walls of the cavity already opened, and then, if another collection of pus be found, it can be drained through the same opening. If a liver abscess have burst into the lung, pleura, stomach, peritoneum, kidney, or pericardium, and can be diagnosed, it should, if possible, be evacuated at its source, and the secondary troubles treated on general principles.

Subphrenic abscess is perhaps not so rare as usually thought; for instance, we had four cases in the Leeds Infirmary during 1891. Although not necessarily connected with liver disease, it is so frequently associated with it, and requires such similar treatment, that any discussion on hepatic surgery would be incomplete if the subject were not considered, although time will allow me to discuss neither the pathology nor the diagnosis. The abscess may be approached in rare instances from the back below the twelfth rib, following along the diaphragm until pus is reached, or, far better, opened through an intercostal space, if possible below the reflection of the pleura; but if this be impossible, and the incision have to be made through the pleura, the two pleural surfaces had better be sutured before the diaphragm is incised.

Hydatid Cysts.—Our experience in England of hydatid cysts is so small as compared with that of our Australian confrères, that I prefer to quote from the experience of others in support of what I believe to be the best treatment, namely, hepaticotomy, first performed for echinococcus by Mr. Tait in 1880, and which I have adopted in several cases that have come under my care.

Dr. Davies Thomas, in an elaborate paper in the *Australian Medical Journal*, says that in a considerable number of cases he had 90 per cent. of recoveries after hepaticotomy, and that as compared with tapping, which failed to cure in 40 per cent. of cases and gave a mortality of 18 per cent., it is much superior. His experience of parasiticide injections was equally unsatisfactory, though Dr. Arthur Sennett reports favourably of the injections of a 1 in 5,000 solution of mercuric perchloride.

In performing hepaticotomy, if possible, the cyst should be approached from below the ribs and the cavity thoroughly emptied, but if it project upward it may be needful to resect a portion of rib, and should the pleura be opened it can be closed by suture. A free incision must be made into the cyst, as the daughter cysts may require to be evacuated by a lithotomy scoop or a spoon. In one case I evacuated successfully a large washhand basin full of small cysts by means of a tablespoon. As soon as the sac is emptied and cleansed by washing out with boracic lotion, its margins had better be sutured to the surface and a large drainage tube inserted. Mr. Knowsley Thornton has proved that drainage is not always necessary with strict antisepticism, but most operators still prefer to drain. Besides hydatid, I have performed hepaticotomy in other liver cysts; in one, a single cyst 3 inches from the surface was attacked in the linea alba; it contained about $\frac{1}{2}$ to $\frac{3}{4}$ pint of clear mucous fluid like gall bladder secretion, and was, I believe, due to a dilatation of one of the hepatic ducts within the liver, as a fistula discharging a little bile was ultimately left.

In another case, in a child aged 4 years, the liver nearly filled the abdomen, and an opening to the right of the umbilicus exposed the liver, free from adhesions. After the parietal and visceral layers of the peritoneum had been united around a space 2 inches in diameter, I freely incised the liver and came on a multilocular cyst, with thin membranous septa; the fluid, which was clear, had a specific gravity of 1008, and contained albumen; no hooklets or other signs of hydatids could be discovered. The child recovered and left Leeds two months afterwards, the liver being then a little larger than normal. I have not been able to hear of her since.

Excision of part of the liver has been performed for hydatid disease, for hernia of the organ through a penetrating wound, for tumours of a simple nature, and for cancer. Vohtz excised successfully an echinococcus cyst about the size of a child's head, together with some atrophied liver tissue. Tansini also had a successful case; and Terrillon succeeded in resecting a portion of the liver containing numerous small hydatid cysts; but, to my mind, resection involves so serious an operation that it can only be justifiable, in hydatid disease, under exceptional circumstances where the safer methods cannot be employed.

A few months ago I exposed a painful tumour, about 3 inches in diameter, in the left lobe of the liver, which proved to be a calcified hydatid, but, as I felt sure the disease was in process of cure, I decided not to perform resection, and the patient has been better since; but should the disease pro-

duce further incapacity, it would be easy to stitch the parietal peritoneum around the tumour, and then to remove it and pack the wound with iodoform gauze.

Resection may be performed with the elastic ligature, with knife or scissors, or with the actual cautery. The elastic suture suggested by Dr. Babacci is worth bearing in mind to bring together the opposing liver surfaces, and so to arrest hæmorrhage and secure early union. Dr. Keen, in the *Boston Medical and Surgical Journal* for April, 1892, records a remarkable case of resection of a liver tumour, which proved to be an adenoma originating from the bile ducts.

Cancer of the liver has been removed by Lücke, the affected portion of the viscus being successfully resected; but, as the disease is usually diffuse and often secondary, it is scarcely likely that the operation will be frequently entertained. I have exposed the liver on four occasions with a view to the removal of tumours, but in each case either other nodules have been present or the disease has been too extensive for successful resection. Curiously, in all the cases the patients have been relieved for a time by the exploration, and in one case—to me quite inexplicable—the tumour, about the size of a goose's egg, adherent to the contiguous parts and hard like scirrhus to the exploring needle, disappeared, and the patient is now quite well, some months after operation. Other operators have also recorded cases where such relief has occurred, but I believe that no satisfactory explanation has yet been given of the "curative effects of operation *per se*."

Dr. J. W. White gives an interesting paper on the subject in the *Annals of Surgery* for August and September, 1891, and relates numerous cases where a simple exploratory operation has apparently been the means of curing disease to all appearance hopeless.

Hepatic phlebectomy, first proposed and practised for congestion of the liver by Dr. G. Harley, F.R.S., and afterwards elaborated by Dr. Kelly, of Philadelphia, who directly abstracts blood from the liver, after exposing it through a small incision, is an operation which, it seems to me, can seldom be called for. I have no experience of it, but, with due respect to its eminent author, I should think it must be attended with a considerable amount of danger, and at the best can only give slight and temporary relief.

AFFECTIONS OF THE GALL BLADDER AND BILE DUCTS.

Affections of the gall bladder or bile ducts requiring surgical interference are, in by far the greater number of cases, dependent on gall stones, which, as is well known, though, to my belief, not sufficiently appreciated, may produce most serious ailments, many of which are only amenable to surgical treatment. I have operated on over fifty cases for cholelithiasis, and among the complications and dangers for which help has been sought have been:—

Repeated attacks of biliary colic, so-called "spasms," without jaundice.

Biliary colic with persistent jaundice and its consequences, such as hæmorrhage.

Intermittent pyrexia, with jaundice and pain.

Persistent vomiting, with such serious digestive disturbances as to threaten death from inanition or exhaustion.

Acute intestinal obstruction due to impaction of a large gall stone in the bowel, or to peritonitis.

Simulation of intestinal obstruction due to irritation and pain.

Localised peritonitis, with or without ulceration of the bile passages.

Perforative peritonitis.

Septicæmia due to ulceration of bile passages.

Abscess of liver.

Empyema of gall bladder.

Dropsy of gall bladder.

Abscess of abdominal walls.

Pyelitis of right kidney, and

Collapse due to intense pain.

The cause of the mischief, the gall stones, may be found anywhere in the biliary tract, and although usually discovered in the gall bladder or in the cystic or common ducts, they may be found in the hepatic duct before it joins the cystic, or even in its ramifications in the liver. Where there is neither jaundice nor distension of the gall bladder, and when so-called "spasms" are frequently recurring and do not yield to

medical treatment, the gall stones will usually be found in a shrunken gall bladder or in the cystic duct, but where jaundice is present the stones will probably be found in the common duct; and in either of these cases my almost invariable experience has been to find numerous and very firm adhesions, showing that the attacks have been frequently associated with local peritonitis. Where there is distension of the gall bladder, associated with pain but without jaundice, one large gall stone or several smaller ones will probably be found blocking the neck of the gall bladder and the cystic duct.

Where there is persistent jaundice, with distension of the gall bladder and without marked pain, I am always suspicious of malignant disease, especially if there is an absence of the intermittent pyrexia which usually coexists with the presence of gallstones in the common duct; and as operation in malignant cases is undoubtedly very much more dangerous than in simple cholelithiasis, the suspicion should be borne in mind, although in many of these cases an exploratory operation may be undertaken in the hope of finding something that can be relieved, or of relieving the cholæmia by diverting the course of the bile.

There is decidedly room for improvement in the diagnosis of cholelithiasis, especially when the question of malignant disease has to be taken into consideration; and in many cases it is almost impossible to differentiate between the mechanical blockage of the common bile duct from malignant disease which has not advanced far enough to produce cachexia, and that from gall stones; although as a rule in the latter there will be history of preliminary attacks of spasms, of pain preceding the jaundice, and of intermittent pyrexia, with absence of enlargement of the gall bladder. The last-mentioned sign is worth remembering, as all the cases of malignant disease with jaundice on which I have operated have had distension of the gall bladder, so as to form a perceptible tumour.

Unfortunately the time at our disposal will not permit a full discussion of the diagnosis of cholelithiasis, but I cannot let the opportunity pass without mentioning one symptom not usually noticed, that is, pain on the left side of the abdomen radiating to the left scapular region. I have operated on three cases where this symptom was present. In two I found gall stones and in one cancer of the gall bladder, but in all three I found numerous adhesions to the stomach, which was fixed firmly to the gall bladder, thus probably explaining the unusual position of the pain.

Of the operative measures undertaken for diagnosis, sounding and aspiration of the gall bladder must be referred to. The so-called "sounding for gall stones," either by means of a probe passed through a cannula or by the fine needle of an aspirator, is both uncertain and dangerous, and it seems to me that it may more safely be replaced by a small exploratory incision, which can be extended for treatment if required. Aspiration of a distended gall bladder through the unopened abdomen, though apparently a simple procedure, is not unattended with danger, death having followed in more than one instance, and in only very exceptional cases can it do any good.

Here, again, I infinitely prefer to make a small exploratory incision, then to empty the gall bladder by the aspirator, and afterwards to explore the bile passages with the fingers. If, however, aspiration without exploration be decided on, a small needle should be used and the cyst emptied as far as possible, in order that intracystic tension may not lead to extravasation through the needle puncture. Of the proper operative procedures, cholecystotomy, cholelithotripsy, cholecystenterostomy, cholecystectomy, and incision and suture of the ducts have to be considered.

I think most surgeons are agreed that cholecystotomy is the operation *par excellence* in the treatment of gall stones, and although, as often happens, where there are adhesions and a shrunken gall bladder, it is an operation of considerable difficulty, statistics prove that in the absence of malignant disease and persistent jaundice, it is a procedure attended with little risk; for instance, out of thirty such cases on which I have operated I have to record recovery in all. Even in the presence of cholæmia the mortality, in the absence of malignant disease, is very small, for out of fifteen cholecystotomies for jaundice with gall stones, in the absence of cancer, I have not lost one patient as a result of the operation.

I think I am able to suggest as worthy of further trial a means of averting danger from hæmorrhage in these cases, but as yet I have only had the opportunity of putting it in practice in one operation. In this example it was considered advisable to explore the liver and bile passages in a case of persistent jaundice of two years' duration, which it was thought might be due to some removable obstruction, but where hæmorrhages from the nose and bowel and ecchymoses under the skin made me fear that bleeding at the time of operation or subsequently might prove a serious difficulty.

Chloride of calcium in 15-grain doses was given every four hours for two days previous to operation; and whether it was due to the use of the drug or not, the fact remains that I had not a single ligature to apply when operating, and the spontaneous hæmorrhages ceased and did not return, although the jaundice persisted for some time after operation. The use of calcium chloride was suggested to me by a valuable paper of Dr. A. E. Wright's, "Upon a New Styptic, and upon the Possibility of Increasing the Coagulability of the Blood in the Vessels in cases of Hæmophilia, and Aneurysm and Internal Hæmorrhage," published in the *BRITISH MEDICAL JOURNAL* for December 19th, 1891. I may just mention that I have employed calcium chloride in uterine and other hæmorrhages also with success.

Although cholecystotomy has undergone various modifications, such as operation *à deux temps* and immediate suture of the opening in the gall bladder—the so-called ideal operation—I very decidedly prefer the old method in which the gall bladder is drained.

Instead of suturing the edges of the incision in the gall bladder to the skin, I fix it to the aponeurotic layer of the abdominal wall, and thus lessen the danger of a fistula, as between the opening in the gall bladder and the skin is a layer of tissue which soon becomes covered with granulations, and the contraction in healing usually secures closure.

I prefer the vertical incision, and have never found it needful to employ any other. The so-called "ideal" operation—that is, closure of the gall bladder—is only applicable to cases where the ducts are clear, which may be known by filling the gall bladder with water through the cholecystotomy opening, and compressing it to see if the fluid will pass on into the bowel. The statistics of cholecystotomy have apparently proved this method to be decidedly more dangerous, but I think, as recently reported cases would seem to prove, the danger may be overcome (1) by proper selection of cases, and (2) by careful suture first of the margins of the incision, and then of the peritoneal surfaces. To my mind, drainage of the gall bladder not only presents the advantage of treating the vesical catarrh by securing physiological rest, but in case the ducts have not been cleared it becomes possible to apply through the fistula hot water or some solvent solution directly to the concretions. Where the gall bladder is shrunken and cannot be brought to the surface, I have usually been able to tuck the parietal peritoneum down, and suture it to the margins of the incision in the viscus, but in several cases where I could not do this I utilised the omentum, suturing it to the gall bladder and to the parietal peritoneum, thus occluding the peritoneal cavity. Where occlusion in this way cannot be effected, the insertion of a drainage tube into the gall bladder without suture of the margins to the wound seems to be efficient. In such cases I have had no untoward results, as it is apparently easier, on account of intra-abdominal tension, for effused fluids to discharge directly through the tube than to pass among the viscera; and probably within forty-eight hours the drainage track from the gall bladder to the surface is quite formed, and no longer communicates with the general cavity of the peritoneum; hence I can see no need to follow the plan suggested by Mr. Knowsley Thornton of performing suprapubic drainage in any of these operations on the gall bladder or bile ducts. In clearing the ducts of concretions, the surgeon must be guided by circumstances; as a rule, forceps within the duct and the fingers outside will overcome any difficulty in the cystic duct, and occasionally stones may be worked backward by the fingers even from the common duct, as I proved a short time ago, where, after trying ineffectually to crush two stones, the size of small nuts, between the fingers placed in the foramen of Winslow and the thumb placed in front of the common duct, I found that I could work them backward, and in a

short time I brought them out through the incision in the gall bladder.

Not infrequently the common or even at times the deeper part of the cystic duct cannot be cleared in this way, and then cholelithotripsy (first performed by Mr. Lawson Tait) may be attempted. I have published a number of cases in which I have crushed stones in the ducts, and afterwards found the fragments in the motions. I always first try to crush them between the finger and thumb, and failing this employ forceps covered with indiarubber. At times this method will fail, when incision of the duct and removal of the concretion, as first performed by Mr. Thornton, may be done; the opening in the duct being sutured, and the right kidney pouch drained. In two cases I have found the gall bladder displaced, and projecting into the right loin, as if the liver had been rotated to the right. In both of them I was able to crush the stones, and clear the ducts without opening the shrunken gall bladder, that is, to perform cholelithotripsy without cholecystotomy. In one case, after cholecystotomy with crushing of calculi in the common duct, the fragments did not pass until I injected a few drops of a solution of turpentine in ether into the fistula. Great pain followed, the duct became patent, and the fistula closed, the patient having remained well since. The result in this case was probably due rather to the contractions set up in the duct than to the solvent action of the remedy used; and I cannot, on account of the severe pain set up for some hours, fully recommend its employment in similar cases.

Mr. J. W. Taylor's method of syringing hot water into the fistula night and morning in order to soften the stone or to force on the fragments is probably a more efficient and safer method, although I have not found the solution of taurocholate of soda which he advised to answer any better than simple hot water, and even in the test tube it seems to be a poor solvent of gall stones.

The following conditions seem to me to be the indications for cholecystotomy:—

1. In frequently recurring biliary colic without jaundice, where medical treatment has failed.
2. In persistent jaundice, where the onset was ushered in with pain, and where recurring pains, with or without ague-like attacks, render it probable that the cause is gall stones in the common duct.
3. In distended gall bladder from impaction of calculi in the ducts.
4. In empyema of the gall bladder.
5. In persistent jaundice with enlargement of the gall bladder dependent on some obstruction in the common duct, even where the cause cannot be clearly made out, but in such cases the increased risk should be borne in mind, as malignant disease may not improbably be the cause of the obstruction.

Cholecystectomy.—I have had three cases in which cholecystectomy has had to be done in consequence of stricture of the cystic duct leading to an accumulation of mucus in the gall bladder, and distress when the fistula was allowed to close. After removal of the gall bladder complete recovery ensued in all. The operation is not difficult, and in my last case a single fine silk ligature around the cystic duct answered quite as well as the more complicated procedure which I previously adopted of covering the stump with a peritoneal flap. As a precautionary method I used a drainage tube for twenty-four hours, but probably this was unnecessary.

I think cholecystectomy for cancer can very seldom be called for; in the only case where I have opened the abdomen for cancer of the gall bladder, the disease had already so involved the neighbouring parts that a radical operation was out of the question.

The following conditions seem to me to be the indications for removal of the gall bladder:

1. Where, after cholecystotomy, a mucous fistula persists, dependent on stricture of the cystic duct.
2. Where, under similar circumstances, owing to accumulation of fluid in the gall bladder, the pain recurs as soon as the fistula has closed.
3. In cancer, if the disease be limited to the gall bladder. Wherever there is obstructive jaundice, cholecystectomy is contraindicated.

Cholecystenterostomy, though not an easy operation, seems to be a successful one, for, out of eight reported cases, seven recovered. In the only case of cholecystenterostomy that I

have done, the operation was performed in 1889 for biliary fistula due to stricture of the common duct, and the patient is at present in excellent health.

I now take the opportunity of suggesting a modification in the operation which will, I believe, make it both more easily and safely performed. The union between the two viscera is effected by means of a small decalcified bone tube shaped like a cotton bobbin, as shown in the diagrams. Only two

Diagram 1.—Drawing of tube for cholecystenterostomy. Measurements: Length, $\frac{1}{2}$ inch; outside diameter of barrel, $\frac{3}{8}$ inch; outside diameter of ends, $\frac{1}{4}$ inch.

Diagram 2.—To show bone bobbin connecting gall bladder to intestine. A continuous suture, including the mucous membrane, unites the margins of the two openings. A continuous suture unites the serous surfaces of the two apposed viscera about $\frac{1}{4}$ inch from the margin of the openings. For convenience the serous suture is applied first around the posterior half circle, then the continuous marginal suture around the posterior half margin, then the tube is introduced and the anterior marginal suture completed and tied, after which the anterior half circle of the serous suture is completed.

continuous sutures—one marginal and one serous—are required, and the operation can be done quickly. The gall bladder can be sutured either to the duodenum or to the colon, preferably to the former, but, if that be impossible, to the latter.

The dilated common duct has on one occasion been opened and connected to the duodenum, so as to establish a fistula between the bowel and the duct. Although the operation must be somewhat difficult to perform, it may prove useful in some exceptional instances where it is found to be impossible to clear the common duct and impracticable to perform cholecystenterostomy, as in cases where the gall bladder atrophied and shrunken and the common duct dilated.

Indications for cholecystenterostomy:

1. In closure of the common duct from stricture where the jaundice is and must be persistent, unless another channel for the bile can be made.

2. In tumour producing obliteration of the lumen of the common duct, thus leading to persistent jaundice, but if the

tumour be made out to be malignant the simpler procedure of cholecystotomy had better be performed.

3. In cases where the gall bladder is distended and it is found impossible or impracticable to clear the common duct of gall stones.

I have avoided many pathological and physiological considerations which might profitably have been touched on and have entered very little into the question of diagnosis, which is perhaps a more important omission, but to deal fully with the whole subject would need a course of lectures rather than a single paper, and, although I have tried to make my remarks as short as the importance of the subject would allow and have avoided giving the details of cases on which my arguments and conclusions are based, I find that I have occupied more time than I intended. For this I offer my sincere apologies and, at the same time, wish to express my thanks for the patient hearing I have received.

VESICULAR ERUPTION ON THE PALATE: A SIGN OF INFLUENZA(?)

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It was in the early part of the year 1891 that I first learned to associate a particular appearance of the soft palate and adjacent parts with the presence of influenza. Whenever the back of the mouth was examined in a good light, the soft palate was found to be more or less completely studded with minute translucent lenticular elevations, somewhat resembling tiny well-boiled grains of sago. They varied in size, being in most cases about 0.5 mm., and hardly ever exceeding 1 mm. in diameter. They gave the idea of small localised distensions of a thin layer of transparent epithelium, and their lens-like appearance was increased by the fact that occasionally a minute blood vessel lying beneath one of them became magnified to quite considerable proportions, although it might be impossible to observe any other part of its course as it entered or left the vesicle on either side. These vesicles were most abundant about the soft palate above the root of the uvula; but in some cases—and these were generally of the more severe type—they occupied a much larger area, being visible over the greater part of the roof of the mouth, but being always most marked and most abundant in the situation first mentioned. The patient was quite unconscious of and apparently unaffected by their existence.

I was, of course, aware that the condition described is to be observed in cases other than those of influenza; nor do I yet venture to suggest that it is pathognomonic of that disease. No one can examine the throats of a large number of persons without occasionally observing the presence of these vesicles, to some extent at all events; but in connection with no other malady had I noticed them to be, not merely so frequently, but constantly, present, and this from the earliest period of the illness and throughout convalescence.

A special opportunity for testing the significance of their correlation with influenza occurred when, in the summer term of the same year (1891), an outbreak of this disease took place at Haileybury College. Abundant vesicles on the soft palate were noted in the case of every boy admitted with undoubted influenza; but such cases are excluded from the present record. Amongst the boys seen daily at the Sick House were a number who reported themselves there on account of trivial accidents or injuries, or complaining of slight and temporary *malaise*, or who came to inquire after the welfare of their friends. The mouth of every such boy was examined; and every boy on whose palate the vesicles were observed was forthwith sent to bed, whether he had any pyrexia or complained of any discomfort—as some did—or not.

Of the 48 boys sent to bed under these circumstances, only 1 failed to develop characteristic symptoms of indubitable influenza within from twelve to twenty hours; while of 17 boys who—though complaining of more or less illness or exhibiting some pyrexia—did not show anything abnormal about the palate, and who were consequently not considered to be beginning influenza, only 5 were subsequently admitted with that disease, but this after an interval of time quite