

ABSTRACT OF

Lectures

ON

DISEASES OF THE GALL-BLADDER AND BILE-DUCTS.¹

Delivered at the Royal College of Surgeons of England on March 8th, 10th, and 12th, 1897,

By A. W. MAYO ROBSON, F.R.C.S. ENG.,

HUNTERIAN PROFESSOR OF SURGERY AND PATHOLOGY, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

LECTURE I.

Delivered on March 8th.

MR. PRESIDENT AND GENTLEMEN,—Had time permitted the anatomy of the gall-bladder and bile-ducts would have formed a subject of sufficient interest for my first lecture but the number and importance of the matters I propose to consider clearly demonstrate this to be an impossibility, some of the more important anatomical points, however, I must not omit.

Congenital malformations.—There is apparently no part of the biliary apparatus, except the liver, which may not be absent. While it is not to be wondered at in the case of the gall-bladder and cystic duct since they are normally wanting in certain animals and are frequently obliterated by disease in the human subject, it affords serious food for thought to find that life has been possible for six months where even the hepatic and common ducts are represented by mere fibrous cords. Hour-glass shaped gall bladder is probably not uncommon, for though I have found only one specimen in the museums, and that at Middlesex Hospital, I have myself operated on two cases in which the distal part of the gall-bladder contained calculi and was connected with the gall-bladder proper by a narrow neck. On numerous occasions I have found the ordinary position of the gall-bladder vacant, and the shrunken viscus to be situated near the transverse fissure of the liver under cover of the pylorus, with the transverse colon adherent over it. On two occasions I have found the gall-bladder, containing gall-stones, displaced very much to the right; in one instance the liver was almost bifid, the left lobe predominating and pushing the right, and with it the gall-bladder, so far round as to make it project into the lumbar region. In palpating the common duct for gall-stones the surgeon frequently feels several more or less hard nodules within the free border of the lesser omentum, by the side or in front of the common duct, and unless it be borne in mind that three or four lymphatic glands normally exist here they may be apt to mislead, especially as they are not unusually considerably enlarged where there is gall-stone irritation. The large peritoneal pouch bounded above by the right lobe of the liver, below by the ascending layer of the transverse meso-colon covering the duodenum internally, externally by the peritoneum lining the parietes, posteriorly by the ascending meso-colon covering the kidney, and internally by the peritoneum covering the spine, has been long recognised, but perhaps not sufficiently appreciated, in gall-bladder surgery. Mr. Rutherford Morison drew attention to it in 1894.² He places such reliance on the ease and safety with which it can be drained that he does not advocate much time being spent in suturing incisions in the gall-bladder or bile-ducts. It is interesting to note that it is capable of holding nearly a pint of fluid before it overflows into the general peritoneal cavity. A deformity of the liver, congenital or acquired, may at times lead to a difficulty in diagnosis, or in treatment. I refer to a tongue-shaped prolongation of the right lobe, which may project below the costal margin for several inches and simulate a tumour of the liver or an enlarged gall-bladder. Professor Riedel has described it, and the projection is sometimes known as Riedel's lobe. It is said to be uniformly due

to cholelithiasis, but in one case at least in my experience I was not associated with gall-stones.

I propose to consider my subject under four headings: (1) inflammatory affections; (2) tumours; (3) the surgical treatment of gall-stones; and (4) intestinal obstruction dependent on gall-stones.

Catarrh of the gall-bladder and bile-ducts.—The larger bile-ducts and the gall-bladder, being lined with mucous membrane, are, like other mucous passages, subject to catarrh, which may be acute or chronic. As, however, acute and chronic catarrhal jaundice are subjects of medical rather than surgical interest, I can only briefly consider them on account of want of time. Acute catarrh is supposed to give rise to the evanescent form of icterus known as catarrhal jaundice, which, more frequently occurring in young persons, usually comes on as a sequence of dyspepsia or as a result of exposure to cold, and is ordinarily unaccompanied by pain or serious illness. When it is borne in mind that the bile-ducts have only a limited calibre, that the mucous lining is capable of swelling so as to occlude the passage, and that the secretion of bile takes place under very low blood tension (according to Naunyn 110 to 220 mm. of water), and is, therefore, arrested by slight backward pressure, it is easy to comprehend how catarrh in this situation should lead to jaundice, though absolute proof of the correctness of the theory is wanting, since simple catarrhal jaundice furnishes no post-mortem subjects. With regard to its etiology, an extension from the duodenum is probably the usual cause of acute catarrhal jaundice, but exposure to cold, extension of inflammation from the liver, carcinoma of the liver, gall-stones, hydatids, pneumonia, and other acute inflammations must be mentioned as causes of catarrh, direct or indirect. Dr. Murchison gives gout and syphilis as causes, and Dr. Fagge includes under this heading jaundice due to fright and that occurring in epidemics. Although it is well known that in cancer of the liver jaundice is a very variable sign, it is not always recognised that the icterus is at times dependent on the associated catarrh, which may be relieved by treatment, though the original disease persists.

Chronic cholangitis or chronic catarrh of the bile-ducts may be simply a sequel to the acute form, and may then give rise to a more or less persistent jaundice leading to a suspicion of serious organic disease. Although there are dyspeptic symptoms due to the associated gastro-intestinal catarrh, with jaundice and some loss of weight, the retention of strength and the absence of serious sequelæ, such as ascites and hæmorrhage, generally enable a good prognosis to be given, especially as the symptoms usually yield to proper treatment. Catarrh of the bile-ducts probably always accompanies jaundice from whatever cause, and as Dr. Moxon has pointed out, a colourless mucus is always found in the bile-ducts when an obstruction in the common duct is complete. A search through the pathological records of Guy's Hospital for twenty years failed to discover any exception to this rule. When the obstruction is only partial, the mucus may be well charged with bile, as the backward pressure is not sufficient to stop the secretion and pouring out of bile into the ducts. Gall-stones are probably always accompanied by catarrh, which, giving rise to the formation of thick ropy mucus, leads to attacks of pain when passing, and it seems not unlikely that some of the minor seizures of pain are of this nature. Although the jaundice in cholelithiasis is usually produced by a gall-stone obstructing the common or hepatic ducts, I am convinced that in many cases jaundice is present when the concretion is in the gall-bladder or in the cystic duct, the obstruction to the flow of bile being caused by an inflammatory swelling of the mucous membrane of the bile channels caused by extension from the seat of obstruction. Riedel³ states that about two-fifths of the causes of jaundice in cholelithiasis arise in this way. The treatment of chronic catarrhal jaundice is at first medical, and if the disease prove obstinate a course at Harrogate or Carlsbad will be likely to do good if the ailment be functional, but that failing, the question of some organic cause that may be removable by surgical treatment should be considered. Dr. Thudichum, describes a catarrh of the finest ramifications of the bile ducts which causes their lining to be shed in the shape of biliary casts. He considers that these often form the nucleus of gall-stones where the catarrh is associated with decomposition of bile. This has been termed by Meckel "lithiatic catarrh"; perhaps a better term is desquamating angio-cholitis or stone-forming catarrh

¹ Mr. Mayo Robson circulated at his lectures a table of 170 operations on the gall-bladder and bile ducts, performed by himself, in which the particulars of each case were recorded. We regret that want of space prevents its reproduction in our columns.

² Brit. Med. Jour., March 3rd, 1894.

³ Gumprecht, Deutsche Medicinische Wochenschrift, 1895, No. 45.

of the bile-ducts. It doubtless has great etiological importance in reference to gallstones, especially when associated with decomposition due to the presence of micro-organism in the stagnant fluid in the ducts.

Catarrhal cholecystitis, or chronic catarrh of the gall-bladder without jaundice, forms a distinct and definite disease, and I have seen several cases in which cholelithiasis has been diagnosed and operation advised; but where neither the gall-bladder nor ducts contained anything firmer than thick, ropy mucus, which was apparently the cause of painful contractions of the gall-bladder simulating gall-stone seizures. In one case of this kind, in a woman, aged sixty years, on whom I operated with Mr. Clifton of Sheffield, the gall-bladder contained bile mixed with thick, ropy mucus. There were no other signs of disease, but the gall-bladder was very large and pouched and the mucous membrane thickened. Cholecystotomy was performed and the drainage was continued for a fortnight, after which the wound was allowed to close. The patient after two years continues well. Dr. Byron Robinson⁴ describes a case in which there were attacks of pain like cholelithic seizures, which he thought were dependent on kinking of the common bile duct producing obstruction to the flow of bile into the duodenum, but which I think may be more easily explained on the hypothesis that it was a case of chronic catarrhal cholecystitis. It came on six months after the removal of gall-stones from the gall-bladder. On opening the abdomen the gall-bladder, though free from stones, was found to be considerably enlarged, although the duct was patent, as proved by syringing water through it into the duodenum. Cholecystotomy resulted in recovery. In these cases the gall-bladder is usually distended, but it rarely forms a distinct tumour, and there is an absence of pain on pressure over it. Unless gall-stones have been present at some time there are usually no adhesions of the gall-bladder or ducts to the neighbouring viscera, proving that the inflammation has not extended through to the peritoneal coat, as it usually does when dependent on cholelithiasis. The benefit derived from a systematic course of treatment in these cases renders it advisable that medical should always precede surgical treatment. The diagnosis from cholelithiasis may usually be made by observing that the attacks are less severe and less prolonged than in true gall-stone seizures; that no gall-stones are found in the evacuations after an attack; that jaundice seldom supervenes, and, if it does, is only very slight; that there is no tenderness on pressure between the ninth costal cartilage and the umbilicus; and that the affection will usually completely yield to treatment. In chronic catarrh of the gall-bladder regular exercise, massage over the hepatic region, the avoidance of anything tight around the waist, careful regulation of the diet, and the judicious employment of saline aperients should be in all cases adopted. The spasmodic attacks may require the administration of a sedative, and in some cases, like those referred to, nothing short of a subcutaneous injection of morphia will do any good. If after a few weeks of general treatment the symptoms are not relieved the case will probably be thought to be one of gall-stones, and operative treatment will be considered advisable. If the gall-bladder and ducts be found free from gall-stones cholecystotomy and drainage should nevertheless be performed, and it will be found useful after the third day to syringe gently a little warm water through the drainage-tube daily so as to wash out the ducts, and after a fortnight or more the tube may be left out and the wound allowed to close. General treatment directed to the cause should be continued for some time afterwards. My proposal, in fact, is to treat obstinate catarrh of the gall-bladder as we do catarrh of the urinary bladder—first by medical and general remedies, and, those failing, to secure physiological rest by means of drainage.

Suppurative inflammation of the bile passages.—At first slight suppurative inflammation of the gall-bladder and bile ducts would seem to be capable of description under one heading, but the subject is by no means as simple as it would appear. Simple empyema or suppurative catarrh of the gall-bladder differs *in toto* from phlegmonous cholecystitis, which, however, is also associated with pus in the gall-bladder, but which is one of the most fatal of diseases if not operated on expeditiously, as not only is there a tendency to gangrene, but to a rapidly spreading lethal peritonitis. The different clinical characters of suppurative inflammation can probably be accounted for

by the presence or absence of certain organisms, and although the bacteriology of this region is still in its infancy sufficient good work has been done to make a review of it well worth considering. It has been supposed that the bile is an antiseptic fluid which tends to prevent decomposition in the alimentary canal, but in a series of observations which I published some years ago⁵ on a case of biliary fistula I found that the absence of bile from the intestine of a woman during a period of fifteen months did not lead to any irregular fermentative process, showing that the alleged antiseptic effect of bile on the fæces is probably imaginary. Normal bile is, however, generally sterile. This was proved by Netter in 1884,⁶ who experimented on dogs, and the fact has been confirmed by Gilbert and Girode,⁷ and later by Naunyn⁸ who found it sterile in two cases within a few hours of death. Frequent inoculative experiments on animals have confirmed these observations, thus explaining a well-known fact that in many cases bile has been extensively poured out into the peritoneal cavity without setting up peritonitis; but in disease of the gall-bladder or bile-ducts the bile is seldom or never sterile, and is capable of producing severe peritonitis. Bloch has demonstrated that the bile in cases of disease of the gall-bladder or bile-ducts always contains micro-organisms, hence he thinks it advisable to perform cholecystotomy in two stages, in order to avoid soiling the peritoneum and producing infective peritonitis. When the flow of bile along the ducts is arrested, micro-organisms often invade the gall-bladder either from the blood or the intestine. Charcot and Gombault⁹ demonstrated the presence of organisms within it after ligaturing the common duct in dogs. This was confirmed by Netter in 1886,¹⁰ who found that twenty-four hours after aseptic ligature of the common duct in dogs, organisms, both staphylococcus and bacillus coli communis, could be cultivated from the bile. The bacillus coli communis exists normally in the human body, and is said to be the most abundant and most constant of the bacteria found in man in health. At one time, as shown by Escherich,¹¹ it may act as an ordinary pyogenic organism producing local abscesses, at another as an active pathogenic germ producing fatal septicæmia. Mr. C. B. Lockwood¹² found streptococci and other organisms, but no amœbæ coli in an empyema of the gall-bladder. Netter¹³ found staphylococci and streptococci present in pathological human bile, and Martin,¹⁴ Gilbert and Girode¹⁵ and Bouchard¹⁶ have found the bacillus coli communis in the bile in cases of inflammation of the biliary passages. In acute or phlegmonous cholecystitis the walls of the gall-bladder are swollen and cedematous, and may be infiltrated with pus. In three out of five of such cases Naunyn found the bacillus coli communis in the pus. Barbacci and others have shown that peritoneal sepsis may occur without perforation of the gut. The spread of infection through the walls of the gall-bladder can readily be explained, on the same hypothesis, showing how virulent peritonitis may arise in these cases, though there be no perforation. Gilbert and Girode¹⁷ found typhoid bacilli in the pus from a case of empyema of the gall-bladder which came on as a sequence of enteric fever. Gilbert and Dominici¹⁸ also assert that they produced suppurative inflammation in the gall-bladder and liver of rabbits by injecting a culture of typhoid bacilli into the common duct. These biological facts are borne out by the clinical observations of Dr. Murchison and of Dr. Hale White, who have found evidence of inflammation and ulceration in the gall-bladder in well-marked and fatal cases of typhoid fever, there being no other cause than the specific disease to account for the trouble. Chiari¹⁹ investigated systematically a series of 22 cases of typhoid fever. With the exception of 3 cases, one of which was in the infiltrating and two were in the necrotic stage, he obtained typhoid bacilli invariably out of the gall-bladder, and in 15 cases they were obtained in pure culture. In 13 of the 19 cases in which a positive result was obtained

⁵ Proceedings of the Royal Society, vol. xlvii.

⁶ Le Progrès Médical, 1886.

⁷ Comptes Rendus. Société de Biologie de Paris, 1890, No. 39.

⁸ Klinik der Cholelithiasis, 1892.

⁹ Archives de Physiologie Normale et Pathologique, 1876, p. 453.

¹⁰ Le Progrès Médical, 1886, p. 992.

¹¹ Fortschritte der Medicin, 1885. ¹² THE LANCET, March 2nd, 1895.

¹³ Archives de Physiologie Normale et Pathologique, 1886, p. 7.

¹⁴ Ibid.

¹⁵ Comptes Rendus, Société de Biologie de Paris, Nos. 90 and 91.

¹⁶ Ibid., 1890.

¹⁷ Société de Biologie de Paris, Dec. 2nd, 1893.

¹⁸ Ibid., Dec. 23rd, 1893.

¹⁹ Zeitschrift für Heilkunde, Band xv., p. 199.

⁴ American Medico-Surgical Bulletin, April 18th, 1896.

there was inflammation of the gall-bladder with small-celled infiltration, œdema, and hyperæmia. In all 22 cases the diagnosis of typhoid fever was confirmed by cultivations from the spleen, mesenteric glands, or liver, or from the larger bile-ducts. How do they reach the gall-bladder? There are three possibilities; either they enter by the bile-ducts, or from the blood, or directly through the wall of the gall-bladder. The last mentioned manner must be very exceptional. Their entrance from the blood has been apparently disproved, and it is therefore probable that they enter by the bile-ducts. There is no doubt that the bacilli multiply in the gall-bladder, and it is possible that they may be responsible for post-typhoidal cholecystitis, for gall-stones, and also for relapses of the disease.

Simple empyema.—Suppurative catarrh or simple empyema of the gall-bladder or suppurative cholecystitis is as a rule associated with gall-stones, but tumours of the bile-ducts, typhoid and other fevers, and other unexplained conditions may also be the predisposing factors, though infection by pyogenic organisms is probably in every case the true exciting cause. Empyema of the gall-bladder must always be looked on as a serious affection, both on account of its causes and its sequelæ, but from a clinical standpoint there is one form which is decidedly less serious than the other. The less serious I prefer to discuss first under the term simple empyema of the gall-bladder; the more serious form I shall consider as a distinct and special disease under the name of phlegmonous cholecystitis. When we bear in mind Charcot's and Gombault's experiments on ligature of the common duct in dogs just referred to, the wonder is that all impacted gall-stones are not associated with empyema; yet such is not the case, and it is only in a certain small percentage that the catarrh passes on to suppuration. When there is an obstruction or any irritation in the cystic duct a simple empyema may result, but when the obstruction is in the common duct it may be associated with suppurative cholangitis, the former being a local suppurative process, the latter an extremely serious disease, rapidly followed by general symptoms, and unless treated by operation often ending fatally. In simple empyema the symptoms will at first depend on the cause; and as this is, in the great majority of cases, cholelithiasis (Courvoisier found empyema to be caused by gall-stones in forty-one out of fifty-five cases) there will be the usual history of gall-stone seizures, followed by a swelling under the right lobe of the liver, and by a continued instead of an intermittent pain. At first the constitutional symptoms may be only slightly marked, and there may be no increase of temperature, though in other cases rigors or chills with fever will point to the formation of pus. The loss of appetite, fever, and general malaise usually lead to loss of flesh and weight. As a rule there is no jaundice or only a slight icteric tinge dependent on associated catarrh of the bile-ducts. Tenderness is nearly always present in consequence of local adhesive peritonitis. The tumour, if seen at an early stage, will move with respiration, descending with the liver and being felt as a rounded swelling. After a time the swelling may become more diffused and general, and the movements during respiration will be less marked or may cease owing to the inflammation extending to the abdominal walls. If the suppuration extends beyond the gall-bladder the pus may make its way through the parietes, and an abscess may form under the ribs. The pus usually, however, selects a more tortuous passage, and following the suspensory ligament of the liver it reaches the umbilicus. The abscess may even burst at a distance from its origin—for instance, over the pubes or over the cæcum. There are generally peritoneal adhesions which prevent extravasation into the general peritoneal cavity, but the pus may make its way into neighbouring organs. If we bear in mind the pouch of peritoneum I have described, it is not to be wondered at that a collection of pus should at times form in that region resembling a peri-renal abscess, though inside the peritoneum and limited by adhesions. Needless to say, an abscess of the gall-bladder only requires treating on general surgical principles by opening and drainage, but at the same time the cause must not be overlooked, as it may often be removed at the same time that the abscess is evacuated. Where the pus is in the gall-bladder cholecystostomy will be advisable. After exposing the gall-bladder it will be wise to aspirate before opening it, in order to avoid soiling the tissues with pus. The walls of the gall-bladder may be found so rotten as to be incapable of holding sutures, or, as in a case lately recorded by Dr. Willie Meyer, there may

be small abscesses in the inflamed wall of the gall-bladder itself. In such cases cholecystectomy may be required. In two cases of empyema of the gall-bladder I simply evacuated the pus, removed the gall-stones, and packed the cavity with iodoform gauze, and although the peritoneal cavity was widely opened no harm resulted, as a lymph barrier was soon thrown out limiting the only partly disinfected area. In abscess due to empyema of the gall-bladder forming at a distance from the seat of origin, it may be wise at first simply to open and drain the abscess and on some future occasion to perform cholecystostomy. In some cases of empyema the patient may not be in a fit condition to bear a prolonged operation, and it may, therefore, be wiser to perform a simple cholecystostomy and to defer the removal of the cause until an examination of the discharge shows it to be sterile, or nearly so.

Acute phlegmonous cholecystitis and gangrene of the gall-bladder.—Acute or phlegmonous inflammation of the gall-bladder was described by Courvoisier in 1890, under the name of acute progressive empyema of the gall-bladder, and he states that it usually terminates fatally in a few days from diffuse peritonitis. Only seven cases are recorded in Courvoisier's statistics. Potain²⁰ also mentions that in addition to the ordinary variety of empyema of the gall-bladder there is a very grave condition of acute empyema, which is followed by rapid peritonitis and death. In one case which he describes death occurred on the second day after the onset of the attack, and although there was no perforation of the walls of the viscus infection had spread through the coats to the general peritoneal cavity. Osler²¹ refers to it as an extremely rare disease. As to the symptoms, although the condition is usually associated with gall-stones, acute cholecystitis may arise quite independently—in this way resembling appendicitis, which may occur without the presence of foreign bodies. Typhoid fever and typhus fever, cholera, malaria, sepsis after operation, puerperal fever, and other unknown conditions may give rise to it. Whatever be the cause, the disease usually manifests itself somewhat suddenly with pain on the right side of the abdomen, rapidly becoming general. A rapid and feeble pulse, quick thoracic breathing, fever, intense depression, marked tenderness on pressure, especially over the right side of the abdomen, rapidly developing tympanites, persistent vomiting, and an extremely anxious expression of countenance are usually present. The acute peritonitis, which is significant of the disease, may be localised at first, but later becomes general. Jaundice may or may not be present, and although an elevation of temperature is usual, it is by no means constant and affords only slight assistance in the diagnosis or prognosis. If the disease be of the very acute or gangrenous variety death speedily occurs, but if of the sub-acute form an abscess may develop around the gall-bladder and the peritonitis may become localised, the disease then resembling a perityphlitic abscess in its course.

Diagnosis.—The diagnosis of phlegmonous cholecystitis practically resolves itself into the diagnosis of the cause of acute peritonitis, starting on the right side of the abdomen. Although this may be due to perforation of the stomach at or near the pylorus, to perforation of the duodenum or the ascending colon, to perforation of the gall-bladder or the bile-ducts, and to other such-like peritoneal catastrophes, the chief affection for which it is likely to be mistaken is acute appendicitis. In appendicitis the pain begins at a lower point in the abdomen and passes towards the umbilicus, whereas in gall-bladder trouble it begins below the right costal margin and passes towards the epigastrium and back to the right scapular region. In all gall-bladder inflammations there is almost invariably a tender spot a little above and to the right of the umbilicus, or, to be more exact, at the junction of the upper two-thirds with the lower third of a line drawn from the ninth rib to the umbilicus. In appendicitis there is in the same way a tender spot at the junction of the outer third with the inner two-thirds of a line drawn from the umbilicus to the anterior superior spine of the ilium, known as McBurney's point. The symptoms of acute peritonitis and paralytic obstruction of the bowels are common to both. Fortunately, the treatment by exploratory incision is appropriate to the various conditions mentioned, so that no serious error is likely to arise in case of mistaken diagnosis.

Treatment.—Relief of pain by subcutaneous injections of

²⁰ Journal de Médecine et Chirurgie, November, 1882.

²¹ Principles and Practice of Medicine.

morphia, will probably always be demanded as a primary measure, and as it is clearly impossible to make a diagnosis of the serious condition within the first few hours, warm applications, absolute rest, the stoppage of feeding by the mouth except in small quantities, and the relief of symptoms as they arise must be followed out; but as soon as the diagnosis of phlegmonous cholecystitis can be established, and it is found that the patient is getting worse, an exploratory incision should be made and the gall-bladder incised and drained, the cause if found being removed. If, however, gangrene be discovered the gall-bladder should be removed, the indications for that measure being as distinct as in the case of a gangrenous vermiform appendix. If, in the subacute cases the inflammation becomes localised and a swelling with tenderness be found beneath the right costal margin, incision and drainage are called for, when at the same time cholecystotomy may be performed, and if gall-stones be present in the gall-bladder or ducts they may be removed. If the patient be too ill to bear a prolonged operation the latter procedure may be left to a subsequent occasion.

Gangrene of the gall-bladder is probably only an extreme degree of phlegmonous cholecystitis. The comparative frequency of gangrene in the vermiform appendix might lead one to suppose that gangrenous inflammation of the gall-bladder would not be uncommon, yet it is extremely rare, and, so far as I know, the case reported by Dr. L. W. Hotchkiss is the only one recently recorded. In order to explain the occurrence of gangrene three factors have to be borne in mind: (a) Thrombosis of the nutrient vessels; (b) bacterial infection; and (c) absence of drainage, and therefore tension. The two latter are present in both gall-bladder and appendix inflammation, but the first factor is more frequent in the vermiform appendix, which is only supplied by one nutrient artery, whereas the gall-bladder has a very free blood supply, not only through the branches of the cystic artery, but also through their anastomosis with the hepatic vessels, where the gall-bladder is fixed to the liver. In Dr. Hotchkiss's case there was an abnormal circular constriction of the gall-bladder with lymph infiltration, which was apparently sufficient to cut off the blood supply from the extremity of the gall-bladder.

Infective and suppurative cholangitis—Infective and suppurative cholangitis, or suppurative catarrh of the bile-ducts, are subjects of deep interest to the surgeon, since the medical treatment of these ailments is somewhat limited. Cholelithiasis is by far the most common cause, and in the museums there are several cases illustrating it. Other causes are hydatid disease, malignant disease of the liver, and typhoid fever. The causes mentioned may be truly termed predisposing, since the true exciting cause is the presence of pyogenic organisms. The bacillus coli communis produces an exudative inflammation of the ducts, and may actually cause abscesses within the walls of the biliary passages. Hepatitis and liver abscess frequently follow on cholangitis, and this is usually followed by general and fatal infection of the system. Endocarditis is at times set up, and as it has been known to follow cholangitis without hepatitis,²² and cholangitis without abscess, this cause should never be lost sight of in any case of ulcerative endocarditis. The bacillus in these cases in the vegetations on the inflamed endocardium has been found to be identical with the one found in the bile. As to the symptoms in suppurative cholangitis there is progressive enlargement of the whole liver, which may descend as low as the umbilicus, the swelling being uniform, smooth, and tender to pressure. If the cause be in the common duct, and the gall-bladder has not previously become contracted, there will be the additional enlargement caused by its distension; but when contraction has taken place, and also when the obstruction is in the hepatic duct, there will be an absence of the signs of empyema of the gall-bladder. Pain may be entirely absent, as in one case on which I operated, where the disease was dependent on cancer of the common duct; but where it is dependent on gall-stones the pain may be severe and paroxysmal, each attack being accompanied by ague-like seizures and an intensification of the jaundice. Jaundice is always present and is usually both persistent and intense. Continued fever, with occasional rigors and profuse perspiration, forms a feature of the disease, and with this there is rapid loss of flesh and strength. Pneumonia and pleurisy, ending in empyema, are sufficiently common to be characterised as distinct concomitants of suppurative

cholangitis. The disease is an extremely serious one and may prove fatal, though if the cause can be removed at an early stage recovery may occur. If the disease be less acute the inflammation may concentrate itself in some part of the liver leading to abscess, which may form a distinct tender swelling and give rise to the usual symptoms and signs of hepatic abscess. As to treatment, unless evacuation and drainage of the infected contents of the bile passages can be accomplished treatment is practically useless. Cholecystotomy should, therefore, be performed, and free drainage established and continued until the bile is sterile or nearly so. Although good results cannot be expected in all cases, an amelioration of the symptoms may be looked for in a fair proportion, and complete relief in others. If a localised abscess be discovered in the liver it should be opened and drained, and though it is scarcely to be expected that operation can be always successful in these serious cases the chances of permanent benefit is worth snatching at, even in the most desperate conditions. Of general means, warm applications to the hepatic regions, an initial mercurial purge followed by milder laxatives, intestinal antiseptics by administering bismuth and salol, the relief of pain by sedatives if called for, and the treatment of symptoms as they arise, will afford some amelioration, though they will probably only give temporary relief. Although surgeons have been performing cholecystotomy for infective cholecystitis and for gall-stones producing infective cholangitis for some years, I think it is only right to give the chief credit of specially operating for cholangitis to M. Terrier. He writes in the *Revue de Chirurgie* for 1895, p. 966:—"Thanks to the opening in the gall-bladder a certain number of important therapeutic results follow: (1) the septic contents of the gall-bladder are evacuated; (2) calculi which are most frequently present there are removed; (3) the other biliary passages more or less obstructed, either by calculi or by swelling of their walls, are rendered as free as possible; (4) the septic bile is allowed to escape and mechanically washes out the lower passages carrying away through the drainage-tube many of the infectious ailments; (5) the relief of pressure prevents absorption of the septic elements; and (6) the relief to the kidneys by allowing the bile to escape freely is also of importance, as they are thus enabled to perform their function more freely in relieving the system of septic and other materials." In the paper referred to M. Terrier relates several cases with the utmost detail, especially interesting on account of the bacteriological examination of the discharge from the fistula at different dates, conclusively showing the gradual diminution in the virulence of the discharge after the drainage has been proceeding for some days, and pointing to the need of rather more prolonged drainage than some of us have been wont to employ—i.e., until a bacteriological examination of the discharge shows it to be sterile, or nearly so.

Ulceration.—Ulcers of the gall-bladder or bile-ducts vary greatly in number, size, and depth, and also in clinical importance. They may be quite superficial, being mere abrasions of the epithelial lining of the mucous membrane, then being as a rule numerous and widespread, or they may be single and deep, extending into or through the muscular and serous coats. Between these extremes every variety may be found. Although cholelithiasis is the most frequent, typhoid fever and cancer are quite common causes. Cholera and tubercle are said to produce ulceration of the bile passages, but I have been unable to find any specimens in illustration. The slighter cases of erosion are seldom seen, though doubtless they frequently exist in cases operated on for gall-stones, and in others where the concretions are passed naturally, but the severer forms of ulceration are more frequently met with as the immediate cause of death. Ulceration is chiefly of importance on account of the serious sequelæ—stricture, perforation, fistula, peritonitis (local or general), hæmorrhage, septicæmia, and pyæmia. The inflammation accompanying ulceration usually extends to the peritoneal coat at the site of the ulcer and leads to a plastic peritonitis, which causes the adjoining organs to adhere to the inflamed surface; thus in the greater number of cases keeping the peritonitis local. Some years ago I pointed out that in nearly every case of gall-stones there are adhesions of the gall-bladder or ducts to neighbouring organs showing that peritonitis is a frequent or nearly constant accompaniment of cholelithiasis. It is doubtless a salutary phenomenon, as otherwise general peritonitis would be much more common, especially in the many cases where the adhesions permit of fistulæ quietly

²² Netter and Martin, Archives de Physiologie, vol. ix., 1886.

forming between the contiguous viscera and where localised abscesses form without general peritonitis. The adhesions may, either by the anchoring of normally mobile organs or by subsequent contraction, themselves become sources of inconvenience or danger; as in the case of a woman, aged thirty-four years, under my care, who, besides suffering from severe spasmodic pain due to chronic catarrhal cholecystitis, had dilatation of the stomach owing to kinking of the pylorus caused by adhesions passing between it and the gall-bladder. After separation of the adhesions and drainage of the gall-bladder complete recovery ensued. The peritonitis may, however, become general, either from perforation or by extension to the peritoneum through the non-perforated walls. Under such circumstances prompt surgical treatment will be required or death will speedily follow. With regard to hæmorrhage, as the ulcer extends the vessels usually become thrombosed, but occasionally severe hæmorrhage results, leading either to hæmatemesis or melæna. The notes of the following fatal case were furnished me by my friend Dr. Peter McGregor of Huddersfield. "A temperate man, aged forty-eight years, had suffered from gall-stone attacks since the age of twenty-six years, but for a year had had no seizure and had gained two stones in weight. Without pain or other localising sign he began to vomit blood, and continued to do so two or three times a day until his death, which resulted from exhaustion in the third week. A necropsy revealed contraction of the liver with numerous gall-stones in the gall-bladder. One, the size of a large filbert, had ulcerated through the walls of the gall-bladder and was projecting into the peritoneal cavity. There was no peritonitis, and death was due to hæmorrhage from the margin of the ulcerated opening." It is to be borne in mind that hæmorrhage is predisposed to in these cases by the aplastic condition of blood occurring in long-standing jaundice. As ulceration is always associated with the presence of pyogenic organisms, septic absorption frequently occurs, leading to constitutional disturbances in the shape of septicæmia and pyæmia. Although cancer may lead to ulceration it seems probable that long-standing ulceration of the gall-bladder or bile-ducts may predispose to malignant disease as they are so frequently associated.

Stricture.—Stricture of the bile-ducts is one of the rarer sequelæ of ulceration, by which it is probably always preceded, except in those cases dependent on malignant disease, which I do not propose to consider under this heading. Though there is no reason why stricture should not be a sequence of typhoid ulceration, such has yet to be proved, and the only cases with which I am acquainted, or concerning which I can glean information, have followed on cholelithiasis or new growth. Stricture may only render itself evident after the original cause has passed away, as in three cases of stricture of the cystic duct and one of the common duct, where I myself removed the cause in the shape of gall-stones, and subsequently had to treat the strictures which afterwards developed, and in another case of stricture of the common duct, where the history of gall-stones was indubitable, though none were found when the abdomen was explored. With regard to the symptoms, stricture, if in the cystic duct, leads to a gradual enlargement of the gall-bladder, which may be quite painless or which may give rise to considerable distress; if in the common duct jaundice supervenes, at first being only slight, but ultimately becoming severe, and being associated with all the usual distressing and dangerous symptoms of chronic icterus. The liver enlarges and may descend to the level of the umbilicus; the gall-bladder may also enlarge, though if gall-stones have been the cause the gall-bladder may have become contracted and so be incapable of distension. Stricture of the hepatic duct is probably extremely rare, for I can only find an account of one case. Needless to say, stricture of the bile passages will scarcely call for diagnosis apart from its cause, though different treatment will be demanded when the disease is recognised at the time of operation. In stricture of the cystic duct the gall-bladder should be removed, as either a recurrence of the symptoms will occur when the wound closes or there will be a permanent mucous fistula. As an alternative the gall-bladder may be short circuited into the intestine. In stricture of the common duct cholecystenterostomy must be performed, otherwise a permanent biliary fistula will certainly follow; at times, however, this may be impracticable, and in such cases drainage alone may be feasible.

Perforation of the gall-bladder and bile-duct.—Perforation

of the gall-bladder or bile-ducts must always be serious on account of an escape of the visceral contents into the peritoneal cavity, the imminence of the danger, however, depending on two factors—first, the nature of the extravasated fluid, and, secondly, the time allowed to elapse before surgical relief is afforded. The presence of healthy bile in the peritoneum, as might occur from an injury such as a stab, a bullet wound, or a blow, in a healthy individual may be tolerated for some time without serious damage, as in a case recorded by Thiersch, who successfully removed over forty pints of bile from the abdominal cavity after the gall-bladder had been ruptured by a blow. The experiments of Schuppel and Bosbrom apparently prove that the peritoneum can absorb extravasated bile without serious trouble, and there have also been several cases reported, in which extravasated bile has been successfully evacuated, either by tapping or by incision and drainage. Such a fortunate result cannot, however, always be looked for, as is shown by the specimens in some of the museums. In all the cases where the history is appended the fact of the long survival after so serious an accident is at once borne home, and the lesson is manifest that operations would in each case have given good hopes of success.

Rupture of bile-duct due to injury.—Mr. Battle has reported the case of a boy who had been run over by a cab. At first there were no definite signs of visceral injury; by the seventh day, however, he was deeply jaundiced, with symptoms of acute peritonitis. Abdominal section was done on the eighth day, and a large quantity of almost pure bile evacuated, but no injury to the bile apparatus could be detected. He died on the ninth day, and post mortem the liver and gall-bladder were found intact, but the common gall-bladder was found completely torn through. This is apparently the first recorded case of such an accident, but I found in Guy's Hospital museum a specimen from a case of Mr. Bryant's, where there is a laceration of the hepatic duct near its origin, in which death occurred from peritonitis after a week's illness, two pints of bile-stained fluid mixed with blood clots being found in the peritoneal cavity. Gunshot wounds of the gall-bladder are rare. Courvoisier has mentioned six cases, in two of which the patients died within a few hours, in a third in six weeks from pyæmia, and in a fourth from septicæmia. The case related by Hans Kehr is, therefore, of considerable interest, as immediate laparotomy with suture of a bullet wound in the gall-bladder of a man aged thirty years was followed by recovery. It is of far more serious moment when the extravasated bile is diseased, as it for the most part is where there is distension of the gall bladder or any disease of the bile ducts; for in such cases the bile is infective and rapidly sets up a diffuse peritonitis, which, unless speedily operated upon, ends fatally. Even in such cases if the diagnosis be made at once and early operation done the prognosis is good, as in the case of a patient, aged forty-five years, who had suffered from gall-stone seizures for twenty-nine years, and whom I saw with my friend and colleague, Dr. Braithwaite. After symptoms of inflammation in the hepatic region extending over several weeks he suddenly became worse and showed signs of general peritonitis. I opened the abdomen in the right linea semilunaris, several pints of bile and pus being evacuated. The abdomen was washed out and drainage-tubes were passed between the liver and diaphragm into the right kidney pouch, and downwards towards the pelvis, with the result that the patient recovered and is now in perfect health. One of the most remarkable cases of perforation of the gall-bladder following typhoid ulceration successfully treated by abdominal section is reported by Dr. Monier Williams and Mr. Marmaduke Sheild in THE LANCET of March 2nd, 1895. The case occurred in a married woman, aged thirty-one years, who was operated on on the fifty-first day of the disease, when the gall-bladder was found to be rigid, thickened, and of a dark plum colour, with a sharply circular ulcer the size of a threepenny-piece near its neck, the gall-bladder containing about one and a half ounces of thick offensive pus; the abdomen was washed out; the distended intestines were emptied by puncture, and gauze packing with drainage adopted, the result being a complete cure. In cases of rupture of the gall-bladder from sudden pressure induced by straining at stool, by vomiting, sneezing, efforts in parturition, and even by blows over the hepatic region, there is in all probability in the greater number of such cases a predisposition to rupture in the shape of

thinning by ulceration or by long-continued distension; otherwise the accident would be much more common. Such cases show conclusively to my mind that it is folly to permit patients with distended gall-bladders, even though symptoms be only occasionally present, to go unoperated on. I know of several such cases where patients are living in a "fool's paradise" owing to such unsound advice. A careful operation in these cases is almost devoid of risk, but rupture is hazardous in the extreme. Massage in cases of distended gall-bladder I look on as the height of folly, though it has been advised by those who should know better. Attempts to force impacted calculi onward by pressure are well calculated to rupture the thinned wall of the gall-bladder or bile-ducts or to cause perforation through the base of an ulcer, leading to extravasation of germ-containing fluid into the general peritoneal cavity and probably to fatal peritonitis. In some cases the primary perforation may lead to the formation of a second cavity bounded by plastic lymph, which may again rupture and lead to a fatal peritonitis. The perforation of the gall-bladder may occur into adjoining parenchymatous organs, and on several occasions I have removed numbers of gall-stones from cavities in the liver produced by ulceration and perforation of the gall-bladder or bile-ducts and direct passage of the contents into the liver tissue. In such cases there are the usual signs of liver abscess following on the ordinary symptoms of gall-stones, which may have been present for years. If the ulceration and perforation occur from the common duct into the substance of the pancreas, acute pancreatitis may follow. If the ulceration advances towards the adjoining hollow viscera—stomach, duodenum, or colon—adhesions as a rule form and the perforation is effected quietly. In one case of this kind which I saw with Dr. Stewart, after a history of cholelithiasis followed by severe stomach symptoms, the gall-stones were vomited and complete recovery followed. In several cases I have seen large gall-stones ulcerate their way quietly into the intestine, only producing serious symptoms from mechanical intestinal obstruction. Rarely gall-stones have perforated into the pelvis of the right kidney, producing symptoms of renal calculus. Not infrequently the perforation may occur after adhesion to the parietal peritoneum, when the events described under simple empyema of a superficial abscess discharging gall-stones may follow. The symptoms of perforation of the bile passages are those of perforative peritonitis from other causes, but there will usually have been premonitory symptoms pointing to the origin of the disease. A sudden pain beneath the right ribs, often followed by collapse and usually succeeded by vomiting, general distension of the abdomen, and a rapid pulse form the prominent features of the disease. If the extravasation is extensive there will be signs of free fluid in the peritoneal cavity. Jaundice, if not present before the accident, usually comes on from absorption of biliary pigment by the peritoneum, and if the bowels can be moved the motions will usually be clay-coloured. If the case be not operated on, death will probably ensue within a few days from toxæmia and paralysis of the bowels, though in some of the cases I have quoted life was prolonged into the second or third week. As to treatment, in these cases medical treatment is useless, and giving opium for the relief of pain so disguises the symptoms that a fatal sense of security is given for a time, and when the mistake is discovered it is too late to operate. As soon as it is clearly made out that perforation has occurred, or even if it be suspected that such is the case, the abdomen should be opened in the right semilunar line. If pus and bile be found they should be rapidly wiped away with gauze or wool sponges, and if the extravasation has gone beyond the local area of disease the abdomen should be flushed with hot boracic lotion. The patient may be too ill to bear a prolonged operation, and if so free drainage, as in the case I have related, will probably do all that is necessary. In draining it may be borne in mind that the right kidney pouch forms a distinct peritoneal pocket, and that a drainage tube applied through a stab opening in the right loin affords a free exit for extravasated fluids coming from the neighbourhood of the gall-bladder. If the whole peritoneal cavity has been soiled a puncture above the pubes large enough for a tube to be passed into Douglas's pouch may be an advantage. If the patient be in sufficiently good condition to permit a search for the rupture, and it can be found, it may be closed by fine silk or catgut sutures, but as a rule it will be wise to open and drain the gall-bladder at the same time. Should marked cholecystitis be found the question of cholecystectomy may

be worth considering, but when the patient is in a critical condition it is a mistake to attempt too much; and as a rule cleansing and free drainage will be all that are necessary or advisable at the time, the removal of the cause being left until the patient is better able to bear a prolonged operation.

The Ingleby Lectures

ON

THE OPERATIVE TREATMENT OF CANCER OF THE BREAST.

*Delivered at Mason College, Birmingham, on May 19th
and 26th,*

BY BENNETT MAY, F.R.C.S. ENG.,

JOINT PROFESSOR OF SURGERY IN MASON COLLEGE, BIRMINGHAM.

LECTURE II.¹

Delivered on May 26th.

GENTLEMEN,—I shall now proceed to consider the results which have been obtained from this method of operating, adopting Volkmann's three years limit as the standard of a cure for comparison with former methods. This means that the patient shall have had a full period of three years or longer after operation without local or internal recurrence. Experience shows that the prospect of permanent immunity is then considerable. At the same time I do not accept this—or, indeed, any other period—as at all absolute, owing to the way in which minute deposits may temporarily remain quiescent and latent. I have seen external recurrence after an interval of eleven years, and not infrequently a patient dies from the disease five, six, or more years after operation, though in these cases I think some sign might have been detected within the three years limit. However, in this limited and provisional sense, I accept it as a cure. Then a distinction is to be drawn between local external recurrence and internal metastatic deposit as evidence of completeness of operation. The efficiency of the operation is more correctly measured by freedom from local recurrence than internal deposit, as the former is evidence that the operative limits were reached and nothing further could have been done. Moreover, it is supposed that cases are taken without special selection so long as they are operable. I believe the following is an exposition of the best work which has been done in the treatment of cancer of the breast on the lines of the radical operation described. The following table shows the recently published returns of three operators:—

TABLE A.—*Cases operated on by the Radical Method and observed for at least three years.*

Surgeon.	No. of cases.	No local recurrence.		Local recurrence.	Percentage of cures.	Date.
		Cured.	Died.			
Rotter	10	6	2	2	60.0	1896
Helferich	35	10	11	14	30.5	1896
Watson Cheyne ...	21	12	4	5	57.0	1896
Total	66	28	17	21	42.1	—

Percentage of cures (average) 42.1; percentage with no local recurrence 68; operative mortality 0.

Von Bergmann does a bold operation on ordinary lines, removing the breast widely with the paramammary tissues, systematically clearing the axilla, and in some cases removes the sternal portion of the pectoralis major. His latest statistics, however, do not come down later than 1885, when he was less careful about clearing the fascia, &c., than now, and I have not included them in this table. Rotter (Berlin) does a wide operation. He removes the whole of the pectoralis major and the pectoralis minor. He also removes the

¹ Lecture I. appeared in THE LANCET, May 22nd, 1897.