Diagnosis and Treatment of Duplication of the Gall Bladder

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Duplication of the gall bladder is a rare anomaly, Boyd (1926) finding two cases following 9,221 autopsies and a further three after review of 9,970 cholecystograms. Although it is a well-documented abnormality with over one hundred examples described, the majority of these have been diagnosed only by radiological methods as the patients were not referred for surgery, (Golob and Kantor, 1942; Ragab and El-Ghaffer, 1951; Hemmati, 1963). The number of instances diagnosed pre-operatively, confirmed at laparotomy and subsequently examined pathologically, appear to be seven. In six of these cases, symptoms were directly attributable to disease in one or both of the gall-bladders as stones were present in at least one of the vesicles in all cases (Table 1). The seventh case, that of Oldfield and Wright (1950) is excluded as the authors were of the opinion that the most likely diagnosis in their case was acute appendicitis and that in retrospect the symptoms were not referable to the duplicated gall bladder. Furthermore, the cholecystogram showed two normally functioning gall bladders, post-operative examination revealed no stones and microscopic examination did not suggest previous acute inflammatory disease in either gall bladder. The purpose of this paper is to describe a further example of duplication.

Case Report

Female. Aged 58.

History: Originally investigated in 1962 for episodic epigastric pain by barium meal examination which was normal. Although a straight X-ray of the abdomen showed gall stones (Fig. 1) further investigation of the biliary system was not carried out. In 1965 following further attacks of epigastric pain, none of which was associated with jaundice, an intravenous cholangiogram was performed which showed a double gall bladder with stones in both organs and calculi in both cystic ducts (Fig. 2). One gall bladder contained predominantly faceted stones whilst the other was filled mainly with "limey bile". Apart from mild epigastric tenderness, no abnormality was found on examination.

Operation: (By Professor Le Quesne on 12.4.65). The abdomen was opened through a right subcostal incision and duplication was confirmed. The two gall bladders were intimately bound together by a common peritoneal covering and two cystic ducts were traced and seen to enter the common bile duct separately. The cystic artery, which was a branch of the common hepatic artery, passed anterior to the common bile duct before dividing into two. The anatomy of this case is identical to that of Cameron (1952). Stones were readily palpable in both organs and a per-operative cholangiogram performed through the inferior cystic duct showed an entirely normal common bile duct. The post-operative recovery was uneventful and the patient was discharged on the tenth post-operative day.

Morbid Anatomy: Complete double gall bladder, ensheathed in a layer of peritoneum, and having two cystic ducts (Figs. 3 and 4). Both gall bladders contained calculi, mixed stones predominating in one and calcium carbonate in the other. Stones of similar composition were impacted in the necks of both vesicles.

Histology: The walls of both gall bladders are fairly uniformly thickened, showing muscular hypertrophy, epithelial crypts and sinus formation. There is diffuse chronic inflammatory cell infiltration in the walls of both organs.

Discussion

The true double gall bladder—vesica fellea duplex—has two separate and distinct vesicles, each of which has its own cystic duct. It is therefore possible for one organ to function independently of the other. Duplex gall bladders

FIG 1.—Plain X-ray of the right hypochondrium showing faceted stones in the upper gall bladder and limey bile in the lower vesicle. In addition two separate shadows are seen and these were interpreted as stones impacted in each cystic duct.
are subdivided into H and Y variations.

1. H Type. The cystic ducts do not unite but enter separately into the common bile duct or into either of the hepatic ducts. It is the more common variation.

2. Y Type. The two cystic ducts unite to form a common channel which then enters the common bile duct.

A third variation has been described on one occasion (Croudace, 1931) in which one cystic duct entered the common bile duct while the other passed directly into the substance of the liver. The accessory duct was not, however, traced to its conclusion and on embryological grounds it is most unlikely that a cystic duct should join a small intrahepatic ductule. It is more probable that this case was an example of the H variety with the accessory cystic duct merely traversing a portion of liver tissue on its course to the right hepatic duct.

In the seven cases reviewed, four cases of duplication were of the H variety and one was a Y anomaly (Table 1). In two cases the exact anatomy of the cystic ducts was not determined. In all, fourteen gall bladders were removed and of these eleven contained calculi. Two of the three gall bladders which were free of stones were examined histologically. One was entirely normal but the other showed evidence of
TABLE 1

<table>
<thead>
<tr>
<th>Author</th>
<th>Age</th>
<th>Sex</th>
<th>Type</th>
<th>Symptoms</th>
<th>X-ray</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nichols 1926</td>
<td>51</td>
<td>M</td>
<td>?</td>
<td>Recurrent attacks right hypochondrial pain</td>
<td>Plain X-ray—two separate rows of calculi</td>
<td>A. 2 stones</td>
</tr>
<tr>
<td>Scott, Sames &amp;</td>
<td>57</td>
<td>M</td>
<td>?</td>
<td>Dyspepsia</td>
<td>Cholecystogram—double gall bladder with lobulated appearance ? stones ? polyps.</td>
<td>B. 3 stones</td>
</tr>
<tr>
<td>Smith 1941</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A. 1 stone</td>
</tr>
<tr>
<td>Cameron 1952</td>
<td>33</td>
<td>F</td>
<td>H</td>
<td>Indigestion and right upper abdominal pain</td>
<td>Cholecystogram—double gall bladder with stones in one vesicle</td>
<td>B. No stones</td>
</tr>
<tr>
<td>Corcoran &amp;</td>
<td>32</td>
<td>F</td>
<td>H</td>
<td>Gall bladder colic with fat intolerance</td>
<td>Cholecystogram—double gall bladder outlined</td>
<td>A. Multiple stones</td>
</tr>
<tr>
<td>Wallace Jones</td>
<td>42</td>
<td>F</td>
<td>Y</td>
<td>Dyspepsia</td>
<td>Cholecystogram—suggestive of duplication and confirmed with IVC.</td>
<td>B. Multiple stones</td>
</tr>
<tr>
<td>1962</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Good function in one, poor in the other with multiple stones</td>
<td>A. Multiple stones</td>
</tr>
<tr>
<td>Dunkerly 1964</td>
<td>29</td>
<td>M</td>
<td>H</td>
<td>Six attacks of epigastric pain</td>
<td>Cholecystogram—Calculi lying outside a normally functioning vesicle. Duplication confirmed with IVC. Two cystic ducts outlined</td>
<td>A. Multiple stones</td>
</tr>
<tr>
<td>Mackie 1965</td>
<td>58</td>
<td>F</td>
<td>H</td>
<td>Epigastric pain</td>
<td>IVC, Two cystic ducts outlined. Multiple stones in each</td>
<td>A. Multiple stones</td>
</tr>
</tbody>
</table>

cholesterolosis with cholesterol polyps ranging up to 0.3 cm. in length.

All the patients were investigated for attacks of upper abdominal pain, though acute cholecystitis (Wilson, 1939), torsion of one gall bladder (Recht, 1951), and carcinoma developing in one of the vesicles (Raymond and Thrift, 1956), have been recorded. There are no specific symptoms of duplication and pre-operative diagnosis is an incidental finding in the radiological investigation of the biliary system. Either the two gall bladders and their cystic ducts will be outlined with contrast, or the presence of a second gall bladder is inferred by the recognition of its stones lying outside the functioning gall bladder, (Dunkerly, 1964). The importance of oblique views has been stressed by Ross (1956) for if one fundus is superimposed on its fellow a cleft gall bladder or a Phrygian cap deformity may be simulated.

Because double gall bladders may function independently, further diagnostic difficulties occur when only one organ concentrates dye. Williams (1957) reported a case in which the cholecystogram demonstrated calculi in a normally functioning gall bladder and no further abnormality was thought to be present. Duplication was only diagnosed following a per-operative cholangiogram when a second cystic duct entering the right hepatic duct together with an accessory gall bladder were outlined. When the only functioning gall bladder is normal and contains no stones, cholecystography may then prove positively misleading in the evaluation of upper abdominal pain, as reported by Moore and Hurley (1954) and Hurwitz (1963). In both cases a diagnostic laparotomy was performed after investigation of the biliary system had been considered normal, and the operative findings were identical—duplication of the gall bladder with one normal organ in association with a diseased and non-functioning accessory vesicle.

When surgery is advised, double cholecystectomy is obvious if radiological examination has demonstrated stones in both organs or if calculi are palpated in each vesicle at operation. A diseased gall bladder inadvertently left in situ may lead later to considerable diagnostic problems and Milbourne (1940) has reported a patient who underwent cholecystectomy on two separate
occaisons. If, however, one of the gall bladders is considered to be normal, opinion differs as to the correct procedure. Ryberg (1960) recommends that when an accessory but otherwise normal gall bladder is found at operation it is justifiable to leave it in situ. Calculi may, however, be found in an accessory vesicle on opening it when not only radiological examination but also direct palpation at operation had been considered normal (Owen and Wallace Jones, 1962). Moreover in the seven cases reviewed, eleven of the fourteen vesicles contained stones and one of the three acalculous organs had numerous cholesterol stones. When duplication of the gall bladder is diagnosed pre-operatively or if found unexpectedly at operation, it is suggested that failure to remove both vesicles is submitting the patient to an unnecessary risk and that the correct treatment must be double cholecystectomy in all cases.

Summary
A case of double gall bladder which was diagnosed pre-operatively and confirmed at laparotomy is described and a further six cases are reviewed. The difficulties in diagnosis are discussed and morbid anatomy is compared. Gall stones were found in eleven of the fourteen gall bladders removed and only one organ was proved to be normal. It is suggested that double cholecystectomy should be performed in all cases of gall bladder duplication.

I would like to thank Professor Le Quesne for his permission to publish this case and for his help in the preparation of the article; also Mr. M. Hobsley for the translation of foreign texts and for much helpful criticism and Dr. J. Bielby for the pathological report.

REFERENCES


GRANULAR-CELL MYOBLASTOMA OF THE PITUITARY

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The following case is reported because of the difficulty of making the diagnosis and its rarity.

Case Report
Mr. C.L.H., Age 69, was first attended medically in 1946 with lobar pneumonia whilst on active Naval service. The resultant emphysema and chronic bronchitis following this episode caused him to be invalided from the service. He was normotensive for his age but considerably overweight.

In 1952 he suffered a herniation of the 4th lumbar intervertebral disc. At the same time, he was issued with a surgical belt to control his protuberant abdomen. Six years later he was reviewed and found to be massively overweight, although he had a moderate appetite. His fat was of feminine distribution. He had mild hypertension (BP 180/100 mm. Hg.). His obesity was treated with Prelinud.
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