stones occur more frequently than my own figures indicate.

There is, as yet, no general agreement about the best method of dealing with these stones. Vaughan perhaps expresses the accepted view when she says: "At the time of operation it is essential to remember the frequency of gall-stones, and if possible to remove the gall-bladder at the same time." This attitude appears illogical. The biliary stones are not due to primary disease of the gall-bladder; if cholecystitis is present, as in the case cited above, it must be regarded either as an accidental complication or possibly as the result of long-continued irritation by pigment stones. The formation of stones results from the deposition of a portion of the large amount of pigment with which the liver cells are called on to deal. If excessive haemolysis is terminated by splenectomy the gall-bladder has only to be emptied, not removed, and recurrence of stones need not be feared. The correctness of this attitude is supported by the results obtained in my own cases.

FIVE CASES

In three patients, operated on more than ten years ago, cholecystotomy and removal of stones was done at the same time as the splenectomy; in none of them has any evidence of biliary disease since manifested itself.

In another patient, a boy 12 years of age, Mr. Newton contented himself with crushing the friable stones digitally, without opening the gall-bladder; there has been no recurrence.

The last case, a man aged 60, is the only one of this series who had previously been operated on for gall-stones; cholecystotomy had been performed twelve years before by another surgeon and a number of stones removed. When Mr. Newton reopened the abdomen he felt a large pigment stone in the gall-bladder. After he had removed the spleen he opened the gall-bladder only to find that the stone had disappeared; doubtless it had been crushed during the manipulation of the viscus. The incision in the gall-bladder was closed with a purse-string suture. This was five and a half years ago, and there has been no recurrence.

Practical experience therefore supports the conclusion reached on theoretical grounds that the proper treatment of the pigment stones so often encountered in familial acholuric jaundice is by splenectomy and by simple emptying of the gall-bladder. This can usually be accomplished by crushing the stones digitally, but cholecystotomy may be necessary. The gall-bladder should be removed only if definite evidence of cholecystitis is present.

Summary

The results of splenectomy in twenty patients suffering from familial acholuric jaundice are reviewed briefly. There has been no operative mortality, and the operative morbidity has been negligible.

Variations in the severity of the disease are familial rather than individual. The family history, as well as the clinical findings in the individual patient, should be considered in determining the advisability of splenectomy.

When biliary pigment stones are present the gall-bladder should be emptied by crushing the stones digitally or by cholecystotomy. Cholecystectomy should be performed only when evidences of cholecystitis are present.

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TEST-MEAL FINDINGS AND BILIARY DISEASE

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In carrying out routine Rehfuß test meals it was noticed some time ago that certain curves had much greater differences between "free" and "total" acids than others. Further inquiry showed that these abnormal ones were suspected of having lesions of the gall-bladder or biliary tract. An effort was made to collect curves from all such cases available; up to the time of writing fifty-one have been examined, and of these twenty-two have been operated on and three have been x-rayed only. These twenty-five cases in which the diagnosis has been established, either by operation or by positive x-ray findings, will now be considered.

Standard Technique

At 9 p.m. the night before the test four small charcoal biscuits are given with a cup of tea, and nothing further is taken for twelve hours. The test meal consists of a gruel prepared by simmering a quart of water, with two tablespoonfuls of medium oatmeal, down to one pint and straining through muslin. The volume is then corrected to a pint with water. A narrow, rubber-ended Ryle's tube is passed, to the second mark, at 9 a.m., and the resting juice removed; two ounces of distilled water are injected into the stomach and removed; and the test meal is given with instructions to drink it all within five minutes, if at all possible. Specimens of from 5 to 10 c.cm. are then withdrawn at fifteen-minute intervals for three hours. All specimens are filtered to ensure sharp end-points to the titrations. One c.cm. of the filtrate is taken, with a pipette graduated in 1/100 c.cm., and is titrated with N/100 NaOH, using Töpfer's reagent for the free HCl and phenolphthalein for the total acids. A graph is then constructed showing the "free" and "total" acids as cubic centimetres per cent. of N/10 HCl. A further curve shows the differences between "free" and "total" acids in the same units, but for the sake of clarity the scale of this difference curve is five times that used for the "free" and "total" acids.

Test-meal Findings

In normal and non-biliary system cases the difference curve rarely rises over 12 c.cm. (Fig. 1).

FIG. 1.—A normal test-meal finding, showing the difference curve between "free" and "total" acids.

The broken line represents free HCl; the dotted line total acidity; and the continuous line the difference between "free" and "total" acids.

In cholelithiasis and cholecystitis and infective conditions of the biliary system the difference curve rises as high as 50 c.cm., and in the series under review is always

Case No.	Clinical Signs	Graham's Test	Type of Free HCl Curve	Highest Point of Difference Curve	Difference Curve most Marked in	Mucus Present in	Bile Present in	Blood Present in	Starch Present in	Difference Curve Interpretation	Operative Findings
1	Positive	—	Hyperacid	2 hours	3rd quarter	All	3 hours	None	All	Infective and possibly obstructive	Stones in gall-bladder
2	"	Negative	Normal	3 "	3rd and 4th	"	R. J.	"	"	Infective	Strawberry gall-bladder
3	Negative	—	"	1½ "	3rd quarter	"	None	"	"	Obstructive and infective	Stone in gall-bladder
4	Positive	—	"	2 "	1st "	"	R. J. & 2-3 hours	"	To 2½ hrs.	Obstructive	" "
5	"	Negative	"	2 to 3 hours	1st, 3rd, & 4th	"	R. J. & 2½-3 hours	R. J.	All	Obstructive and infective	Stones in g.b. and common duct. Infective g.b.
6	"	"	"	2 hours	3rd and 4th	"	None	None	"	Infective	Strawberry gall-bladder
7	"	—	Hyperacid	1½ "	2nd, 3rd, & 4th	"	"	"	"	Obstructive and infective	Stone in gall-bladder
8	"	—	Normal	1½ "	1st, 3rd & 4th	½-1 hour	R. J.	"	"	"	(Medical diagnosis) Haemolytic jaundice
9	"	Negative	Hyperacid	1-2 "	1st, 2nd, & 3rd	1-2 hours	R. J. & 1½-3 hours	"	"	Obstructive	Inflamed g.b. No stones
10	"	—	"	½ hour	All	None	None	"	"	Obstructive and infective	G.b. thickened and fat-laden
11	"	—	Normal	1 "	1st and 2nd	"	R. J.	"	"	Obstructive	Stone in gall-bladder
12	Negative	Positive	Hyperacid	1 "	"	All	R. J. & 2½ hours	"	"	"	" "
13	Positive	—	Achlorhydria	R. J.	1st	R. J. & ½ hr	R. J.	"	"	"	" "
14	"	—	Normal	1½-2 hours	2nd, 3rd, & 4th	All but R. J.	"	"	"	Obstructive and infective	Stones in g.b. ? Malignant gall-bladder
15	"	Negative	Hyperacid	1½ "	2nd and 3rd	All	None	"	"	"	Enlarged gall-bladder
16	"	—	Normal	R. J.	1st and 2nd	"	R. J. & 1½-3 hours	"	"	Obstructive	Stones in g.b. and common duct
17	"	—	Hypo-acid	"	1st	"	None	"	"	"	Stones in g.b. One in cystic duct
18	Negative	—	Achlorhydria	2½ hours	4th	"	1½-2½ hours	All	1-1½ hrs.	Infective	Carcinoma of stomach. Secondaries in the liver
19	Positive	—	Hypo-acid	2½ "	3rd	None	All	?	All	"	Gall-bladder small and thickened. Held stones
20	"	—	Hyperacid	1½ "	R. J., 3rd & 4th	All	2-2½ hours	All	"	Obstructive and infective	Stones in g.b.; g.b. small and functionless. Gastric ulcer
21	"	Positive	"	2½ "	2nd, 3rd & 4th	R. J. to 2½ hours	2-2½ hours	None	"	"	X-rayed only. Stones seen
22	"	"	Marked Hypo-acid	2½-2½ "	4th	All	None	"	"	Infective	X-rayed only. Ptoised gall-bladder
23	"	"	Hypo-acid	1 hour	2nd	None	2½ hours	"	"	Obstructive	X-rayed only. Stones seen
EXCEPTIONS											
24	"	Negative	Achlorhydria	—	Normal	All	2½-3 hours	"	1-1½ hrs.	Normal	Strawberry gall-bladder
25	"	Positive	Normal	—	"	None	All	"	All	"	Chronic inflammation of g.b. Stone in gall-bladder

R. J. = Resting juice.

G.b. = Gall-bladder.

over 12 c.cm. (except in Cases 24 and 25), and usually lies between 14 and 20 c.cm. The shape of the curves will be discussed later.

The table shows the main points of each case, and the following general points emerge.

Bile.—Is an uncertain factor; in seven cases it is absent; in five it is in the resting juice only; in five in resting juice and in one or more specimens towards the end of the test. In

FIG. 2.—The difference curve in obstructive biliary disease—highest early in the test and then tends to fall. (Case 16.)

two instances only is it found between the first and eighth specimen. In six cases it only appears in the later specimens.

Mucus.—In five cases it is absent, in five in some specimens, and in fifteen it is present throughout. Sometimes it is in such quantities as to make filtration a matter of difficulty.

Starch.—Persists to the end in all but three cases.

Blood.—Only found in quantity in the cases of carcinoma of the stomach and of gastric ulcer. The trace in the resting juice of Case 5 was probably due to trauma by the tube.

Shape of Difference Curve

The present series is short, but it does appear that if there is obstruction of any kind in the biliary system,

FIG. 3.—The difference curve in infective biliary disease—highest point in the last part of the test, and may even be at the last specimen. (Case 2.)

gall-bladder, ducts, or liver, then the difference curve is highest early in the test and tends to fall (Fig. 2). If it is an infective condition then the highest point is later, and may even be at the last specimen (Fig. 3). A combination of the two keeps the curve high throughout.

It appears that if stones are present and are not causing obstruction but only irritation and inflammation then the curve will be high about the mid-point and will remain so (Fig. 4). Case 18 is interesting, as at operation carcinoma of the stomach was confirmed and also the presence of secondaries in the liver.

FIG. 4.—The difference curve in cholelithiasis without obstruction. The curve is high about the mid-point of the test, and remains so. (Case 14.)

Cases 24 and 25 are the two exceptions so far encountered. There is nothing to distinguish them from others that have given positive "difference curve" results.

Summary

1. A method is described for interpreting the difference curve between "free" and "total" acids in the ordinary test-meal findings in relation to the diagnosis of biliary disease.
2. Twenty-five cases are described, in two of which this technique failed.
3. In the same series of twenty-five cases eleven had a Graham's test, the x-ray findings in six of them being negative.
4. It is suggested that the ordinary test-meal, interpreted thus, may be as effective, if not more effective, than the expensive Graham's test in the clinical investigation for biliary conditions.

At this point I can offer no reasonable explanation of these findings, but the investigations are being continued, and I would tender my thanks to Mr. A. Callam, Mr. J. A. Mackenzie, and Mr. J. H. Watson for permission to investigate their cases before operation.

E. Blotner (*Ann. Int. Med.*, January, 1936, p. 987), who records an illustrative case, states that since the excessive use of tobacco produces definite effects on the peripheral vascular system it will be of value in future to investigate carefully the history of excessive smoking in diabetic patients. Diabetics who are ardent smokers should be advised moderation in smoking, so as to avoid unnecessary gangrene. Blotner's patient was a Jewish business man, aged 34, who began to smoke at the age of 17, and used thirty to forty cigarettes a day up to two years before death, when diabetes developed. He then began to smoke forty to eighty cigarettes a day, with a daily average of about sixty. Gangrene of the right foot and leg developed three months before death, which occurred nine days after a mid-thigh amputation. The fundamental lesion, as usual, was arteriosclerosis with superimposed thrombosis and infection. The essential pathological changes in the amputated leg consisted in thrombosis in the posterior tibial artery. Distal to the clot, the plantar arteries and the peroneal artery showed considerable atheromatous change.

Clinical Memoranda

A Case of Urinary Amoebiasis

REVIEW OF THE LITERATURE

Kelker in 1927-8, collecting material for his thesis on "Surgical Aspects of Amoebiasis," was unable to find a single case of urinary amoebiasis. Gharpure and Saldanha, analysing the post-mortem data of over fifty years in the Grant Medical College, did not encounter any case of urinary infection. Khouri has described one case, and Charaffudin records two cases of amoebic pyelitis with fever, pain in the lumbar region, haematuria, and in the urine casts, pus, and amoebae, about fifty microns in diameter, showing a rotary movement. Cystoscopy showed hyperaemia of the urinary bladder and ureteric catheter specimens contained amoebae.

Castex has described amoebic parenchymatous nephritis with haemoglobinuria and orthostatic haematuria, and a cystitis due to amoebiasis followed two weeks later by dysentery. Baelz, one of the first to discover a urinary amoeba, considered it as a different species (*Ent. urogenitalis*). Rocca has recorded a case of cystitis occurring eleven years after an acute attack of dysentery; vegetative forms of amoebae were present in the urine and in the stools. After emetine treatment vegetative amoebae disappeared from the stools but not from the urine. Franchini also described a case where emetine proved ineffective. Deschiens and Melnotte, who examined 300 urines from cases of intestinal amoebiasis, with negative results, criticized the emetine cure criteria. Faust showed amoebae in urine containing both red blood cells and bacteria. Van Custem-Franco found non-motile amoebae, containing red cells, in urine.

CASE REPORT

A female aged 27 had complained of pain in both loins since the fifth month of pregnancy. She had a history of diarrhoea, lasting for twenty days, three years previously. There was no history of blood or mucus in the stools and no pain during micturition. The pain in the loins subsided after a normal delivery.

A sample of urine was received for routine examination on July 11th, 1935, twenty days after childbirth. The first examination of the centrifuged deposit showed a large kidney-shaped amoeba about five times the size of a polymorphonuclear leucocyte. With a high power a clear ectoplasmic pseudopodium was seen. The endoplasm was granular and the nucleus showed a crenated outline, and resembled an entamoeba nucleus. No cell inclusions were seen. The deposit also showed red blood cells, and a few pus cells and transitional cells. During observation the amoeba sent out a fair number of blunt pseudopodia and became mulberry-shaped, the whole process being sluggish. Further examination of the same material showed another amoeba, which consisted of two pyramidal masses joined by a thin filament of protoplasm; one portion gradually flowed along the filament into the other and a red cell was noticed in each portion. Closer examination revealed further typical amoebae containing red blood corpuscles but free from bacteria and showing sluggish movements. Catheter specimens of urine were examined repeatedly every other day for two weeks. The urine showed amoebae on four occasions. The examinations of the stools were negative. A cystoscopy was done, but no lesion could be detected in the urinary bladder. The vaginal contents failed to show either pus cells or amoebae. The Wassermann reaction was negative and the blood urea 30 mg. per cent. The patient left without treatment.

DISCUSSION

The cases of urinary amoebiasis fall into two groups.

1. Cases in which an ascending infection occurs, amoebae in the faecal discharge being implanted on the perineum and kept alive more easily by the Oriental custom of using water