has a freedom of choice: if he does not want to work in hospital, or if the hospital does not offer adequate working conditions, or if there are no posts open for his speciality, he can decide to settle as a free practitioner in his speciality. On the other hand, the patient has freedom to choose a general practitioner or a specialist. There are exceptions: a senior hospital specialist may be allowed to provide outpatient care if no specialist in free practice is available in the region, or if the technical facilities of his hospital are needed for certain diagnosis or treatment. A local committee of doctors and sickness fund representatives adjudicates in such cases.

Road to State medicine

The freedom of choice between a hospital career or independent practice is the most important element of doctors' freedom. So it is the main target of attack by those who want to pave the way to State medicine. The present draft Bill will allow hospital doctors to provide outpatient care—under the pretext of saving money. Nobody has proved that this change will be cheaper. But as it is not the hospital doctor but “the hospital” which will provide, in the long run it means that independent practice for specialists will become more and more difficult. The next step will be the installation of complete outpatient departments in hospitals, and for the German doctors the most important element of their freedom will be gone.

The president of the federal panel doctors' association, Dr Hans Wolf Muschallik, has protested to the Chancellor, Herr Helmut Schmidt, who so far has been somewhat taciturn about this dispute despite his nickname “Schmidt-the-lip.” Dr Muschallik has said that according to the law, practitioners under collective contract with the health insurance system are not allowed to strike. And their association, being a public corporation, is bound to obey the law, even if they do not like it. But

doctors are able to resign their membership and their contracts and offer their services privately.

Lesson of history

This is not a carbon copy of the action for which the BMA prepared in 1965. Dr Muschallik's predecessor, the late Dr Friedrich Voges, made the same suggestion in 1960 in protest against a Bill promoted by the then Minister of Social Affairs, Herr Theodor Blank. Dr Voges provoked one of the severest clashes in medicopolitical history: Herr Blank retorted, threatening with jail. Dr Voges survived the clash, however, and Herr Blank had to withdraw his Bill: soon afterwards the Minister resigned.

Will history repeat itself? I hesitate to forecast but if history is a guide the next move promises to be quite interesting.

Postscript

Since I wrote this article there have been further developments. You may have read in your newspapers that in some parts of Germany doctors “struck” in protest against the Bill, which has now been approved by the Cabinet and sent to both houses of parliament (one of which, by the way, is dominated by an opposition majority). But to call these actions “strikes” is an overstatement. In parts of Lower Saxony and Bavaria doctors and dentists kept their surgeries closed for one day. But they organised a generous emergency service, so the effect was little different than if 1 May bank holiday had fallen on a Friday. Nevertheless, the new Minister for Social Affairs, Herr Herbert Ehrenberg, was most upset, accusing the doctors of blackmail. We shall now have to await events as the Bill goes through the Bundestag during the next three months.

Hospital Topics

“The cholecystogram is normal” . . . but . . .

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A doctor receiving a report that a patient's cholecystogram was normal would probably give symptomatic treatment with antacids, so long as the results of clinical examination and barium studies of the oesophagus, stomach, duodenum, and perhaps colon, had also proved normal. An unusual response might be to question the validity of the report. The purpose of this paper is to show that patients with gall bladder disease may have apparently normal cholecystograms and to present a series of such patients whose clinical histories have justified elective cholecystectomy.

Patients

This series of 22 patients started in 1968 when I became sceptical of the teaching that fatty or flatulent dyspepsia was not caused by gall stones or gall bladder disease and so would not respond to cholecystectomy. All 22 patients have had at least one oral cholecystogram reported as normal and some have had three cholecystograms over the years. Two patients, one of whom was a doctor, had a 13-year history of symptoms. Fatty meals were usually requested when repeat cholecystography was done. The principal justification for operation was the history, which I often took two or three times before explaining to the patient that the symptoms might be relieved by cholecystectomy, in spite of the apparent normality of the x-ray picture. The patients were often thoroughly disheartened by their symptoms and the reassurances that had given them so little relief, and they usually agreed readily to operation, and accepted that in addition, a full examination of the abdominal viscera was a valuable aid to diagnosis and possible later treatment.

If laparotomy is performed in these circumstances I believe the surgeon should proceed to cholecystectomy and intraoperative cholangiography. The gall bladder may feel and look normal but this

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does not exclude diffuse cholesterosis, chronic cholecystitis, or the presence of one or two small calculi in the gall bladder or duct system. Eighteen (82%) of the 22 patients had histologically abnormal gall bladders, 12 showing chronic cholecystitis (two with small stones) and six cholesterosis or adenomyomatosis. Of the 18 patients, 16 were cured of their symptoms and the other two said that they were improved. Four patients had macroscopically and microscopically normal gall bladders: after operation two were cured, one was improved, and one remained the same. There were no operative complications and no deaths.

Routine cholecystography

Both doctors and patients have benefited from the routine radiological service provided by hospital x-ray departments for family practitioners. A potential disadvantage, however, is that the doctor usually receives only a written x-ray report. Hospital clinicians who hold combined conferences with their radiological colleagues are continually made aware of the value of a "second look," when previously reported radiographs are reassessed with a more complete knowledge of the patient's clinical condition than is often available from the x-ray request form. At these meetings the x-ray report may be qualified or further radiological investigations may be arranged.

Cholecystography is a relatively straightforward procedure and in most cases a finding of normal function (or non-function) is a reliable indication of normality (or disease) of the gall bladder. *Falsely abnormal* results—that is, when there is no filling of a normal gall bladder—are well recognised. The common causes include: the patient forgetting to take the contrast medium the night before; an obstructive lesion in the upper gastrointestinal tract, such as pyloric stenosis, which prevents absorption of the medium; an irritant effect of the oral contrast medium which produces diarrhoea so that not enough contrast medium is absorbed to outline the gall bladder; or liver disease or obstructive jaundice, both of which may prevent adequate excretion of the absorbed medium into the bile. In those with liver disease a further straight radiograph 24 hours later will sometimes show gall bladder filling. Only the unwary would recommend operation without regard to these possibilities and without arranging a further, perhaps double-dose, oral cholecystogram or an intravenous cholangiogram if there were any doubt.

What is not so well recognised is the *falsely normal* result. Apparently normal filling may occur in spite of the gall bladder being abnormal. The almost inevitable result is that functional dyspepsia is diagnosed and the patient may suffer months or even years of further symptoms, perhaps being treated for anxiety or depression before another opinion is sought or another cholecystogram done.

A brief discussion of the abnormalities of the gall bladder that may cause the characteristic symptoms of flatulent dyspepsia or biliary colic may help to explain the falsely normal cholecystogram.

Gall stones

The commonest cause of biliary dyspepsia or colic is gall stones, of which only about 20% are radio-opaque (reports vary from 10 to 25%). Radiographically, therefore, a few gall stones will be diagnosed on the straight abdominal radiograph that should precede a cholecystogram, and some will show up as an incidental finding during other examinations. Most gall stones, however, are shown on the x-ray picture as non-opaque filling defects in a gall bladder that fills on cholecystography or are found later at operation for a non-functioning gall bladder. The cholecystogram report should indicate that a control film was taken before the patient took the oral contrast medium. If it was not, one or two small opaque gall stones may easily be masked by the contrast medium in the gall bladder, which may cause a falsely normal result. A falsely normal result may also occur when small non-opaque stones are disguised by the density of the medium.

It is estimated that about 2-10% of gall stones are missed on cholecystography.¹ Large² reported that a gall stone might be lodged in the cystic duct yet not obstruct it and so might not show itself in spite of the gall bladder filling normally with contrast medium. Gall stones may be retained for long periods in the common bile duct. Although symptoms such as colic, transient jaundice, cholangitis, or even an attack of acute pancreatitis, often draw attention to these stones there may sometimes be little other than occasional pain or dyspepsia to suggest their presence. An oral cholecystogram may appear normal unless there are further stones in the gall bladder. The cystic

duct and common bile duct are not always shown during routine cholecystography, and the true diagnosis may therefore be delayed.

Gall stones may pass from gall bladder to common bile duct and from common duct to duodenum, usually during an attack of colic, but sometimes painlessly. They may leave behind them an abnormal gall bladder, liable to produce symptoms in the future and possibly to be the site of further stone formation. Again, unless further stones do form a cholecystogram will probably be normal. Recently a woman patient underwent urgent cholecystectomy because of recurrent biliary colic. Three weeks before operation a cholecystogram had shown 16 small non-opaque calculi in her gall bladder which filled normally with contrast medium. At operation there were no gall stones in the gall bladder; neither were any seen in the duct system when an intra-operative cholangiogram was performed. She had cured herself of stones but her gall bladder was removed and proved histologically abnormal. Without operation she might have suffered further symptoms. If a patient undergoing investigation for upper abdominal discomfort or dyspepsia has at any time had an attack of pain suggestive of biliary colic this should weigh strongly in favour of a biliary cause for the symptoms, even if the cholecystogram is reported normal.

Acute cholecystitis

Acute cholecystitis is usually, but not invariably, associated with gall stones and it is often not infective in origin. A cholecystogram performed in the acute phase will appear abnormal because oedema or calculous obstruction of the cystic duct will prevent the gall bladder from filling. When the inflammation subsides the gall bladder is usually left permanently damaged and a later cholecystogram proves abnormal, but filling may be possible again and if so the repeat cholecystogram may show "normal function."

Unlike the contrast media used in the past, those used today may be excreted in the bile in a concentration adequate to show the gall bladder and possibly the duct system without the need for concentration to occur in the gall bladder. This technical advance, therefore, has a small disadvantage in that a poorly functioning gall bladder may be misdiagnosed as normal. When repeat cholecystography is requested, or when there has been a history of biliary colic or acute cholecystitis, the experience of the radiologist and the adequacy of the clinical information with which he is provided are important factors in obtaining a correct x-ray diagnosis.

Acalculous gall bladder disease

"Acalculous gall bladder disease" is a term that is often heard. While it may reasonably be applied to the group of gall bladder conditions known as the cholecystoses,³ where there are usually no stones and never have been any, it is hardly applicable to the gall bladder or duct system that is harbouring a stone which is not visualised by standard x-ray techniques. It would be more accurate if it were reserved as a postoperative rather than a preoperative diagnosis.

The cholecystoses may produce symptoms that are indistinguishable from those of calculous disease. Examples of such conditions are cholesterosis, which produces the "strawberry gall bladder" in its diffuse form and the single or multiple cholesterol polyp in its localised form; and adenomyomatosis, sometimes referred to as "cholecystitis glandularis proliferans." They may, however, provide the background to later stone formation or to an acute inflammatory episode which presents clinically as acute cholecystitis.

Further investigations

Diagnosing acalculous conditions cholecystographically may prove difficult, if not impossible. Mucosal polyps may show as small filling defects in relation to the gall bladder wall, and adenomyomatosis may be suggested either by an irregular outline of the gall bladder wall produced by filling of Aschoff-Rokitansky sinuses or by a broader filling defect, usually in the fundus of the gall bladder. The diffuse form of cholesterosis may appear cholecystographically normal. The radiologist may have to recommend a different bowel preparation to clear faecal and gas shadows from the right hypochondrium and change his standard technique to take multiple radiographs with the patient in different positions to show a small mucosal defect.

This more exhaustive examination, accompanied by screening and perhaps an additional 24-hour film to detect delayed emptying, is also

necessary when looking for small gall stones that may have been missed before. Time, economic factors, and the relatively few patients whose abnormality is not displayed by the standard cholecystogram make this extended examination impractical as a routine. Some radiologists will also not consider it necessary routinely to give a fatty meal to study gall bladder emptying, particularly when the patient has a combined cholecystogram and barium meal examination. Although there is some controversy about interpreting changes in the gall bladder outline after a fatty meal, this technique should certainly be adopted in the further investigation of gall bladder disease. Previously unseen stones may be shown after a fatty meal, and poor emptying is probably significant. Occasionally ingestion of the fat precipitates an attack of pain: whenever this has happened in my experience the symptoms have been cured by cholecystectomy.

A recent development in cholecystography is the use of cholecystokinin injection, instead of the fatty meal. This method may help to identify falsely normal cholecystograms, though it is not yet widely used and may have its main application in the investigation of "acalculous" gall bladder disease. Valberg *et al*⁴ administered cholecystokinin to 13 women who had normal cholecystograms but whose symptoms were of "typical biliary type pain associated with vomiting and tenderness in the right upper abdomen." The pain was reproduced in each patient. Twelve underwent cholecystectomy and were cured. Freeman *et al*⁵ also reproduced symptoms in 10 out of 31 patients with normal cholecystograms by injecting cholecystokinin. Abnormal patterns of gall bladder emptying may also be evident on x-ray screening.

Benefits of cholecystectomy

There is still much controversy over the causes of flatulent dyspepsia and hence the role of cholecystectomy.⁶⁻⁸ In this series of 22 patients the cure rate after cholecystectomy has been 82%, and this compares well with the results in other studies.

Keddie *et al*⁹ recently reported a prospective study of 62 patients with acalculous gall bladder disease. Some 90% obtained complete relief from cholecystectomy, all the gall bladders being histologically abnormal. The commonest abnormality (48%) was adenomyomatosis. Twenty-nine of the 31 patients of Freeman *et al*⁷ were women, and all had had repeated investigations after the cholecystogram had proved apparently normal. Two had had previous laparotomies, and five had been referred at some stage for a psychiatric opinion. Of these 31 patients, 22 had a cholecystectomy and 20 were cured of their symptoms. Nora *et al*¹⁰ described 14 patients, 12 of them women, who had had repeatedly negative cholecystography in spite of a history suggestive of gall bladder disease. Six of the 14 patients had had three or more cholecystograms. On the basis of the history and delayed gall bladder emptying after a further oral cholecystogram all were subjected to cholecystectomy. All had histologically abnormal gall bladders and, in a follow-up of 10-60 months, 12 had "good" results (86%) and two "fair" results. As a result these workers adopted cholecystokinin stimulation tests during cholecystography and in 10 more such patients symptoms were reproduced or the gall bladder showed abnormal contractions or delayed emptying. The post-

cholecystectomy follow up in this group was short, but nine of the 10 gall bladders were histologically abnormal.

Conclusion

Careful consideration must precede a recommendation for cholecystectomy in a patient with a normal cholecystogram. Clearly, however, a normal standard oral cholecystogram is not proof of anatomical or functional normality of the gall bladder, and there are a few patients with symptoms characteristic of gall bladder disease whose gall bladders prove to be histologically abnormal in spite of the normal radiography; these patients are usually cured by cholecystectomy. There is an even smaller group with normal histology who again are cured by cholecystectomy, and the likely explanation for this is that there is a functional abnormality of gall bladder motility (comparable with the "irritable colon") that produces the symptoms. Valberg *et al*⁴ support this concept.

Inevitably, a few patients' symptoms will remain unchanged, but with careful selection they will represent a small minority. They and their medical advisers will, however, benefit from the information gained at laparotomy. Their number must be set against the 80-90% who can be cured, and for this difficult clinical problem this is a most rewarding result. Patients should be selected for operation by an experienced clinician after careful study of the history, with help from specialised cholecystographic techniques. Perhaps a wider knowledge of the abnormalities affecting the gall bladder and of the limitations of routine cholecystography will help to reduce the number of patients diagnosed as having radiographically "negative" dyspepsia.

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ONE HUNDRED YEARS AGO The Professor-Superintendent of the Brown Institution, Dr Burdon Sanderson, in a report to the Committee of that valuable establishment, gives an interesting account (which we find in the *Farmer*) of experiments made by him on several animals, by introducing the liquid from pleuropneumonia-infected lungs into the body of healthy animals by subcutaneous puncture or injection into the blood-stream. From these trials, two new and important facts have been learnt, namely: that the introduction into the subcutaneous tissue of the exudation liquid of pleuropneumonia, when the necessary precautions are used against septic infection, is not attended with any of the dangerous effects usually attributed to it, and that the liquid may even be mixed with the circulating blood without risk; and secondly, that the constitutional disturbance occasioned by the last-mentioned procedure is of extreme mildness, and exhibits none of the characteristic features of the formidable and fatal malady with which it is identified by its origin. The consideration of these facts, which Dr Burdon Sanderson admits were as surprising to himself as they were opposed to received beliefs on the subject, at once suggested the question whether the trivial effects produced by

injection may not, notwithstanding their apparent mildness, be associated with an internal constitutional change sufficient to render the animal incapable of future infection by the ordinary means, *ie*, by cohabitation with diseased animals. If it were possible to answer this question in the affirmative, he says, it is easy to see that consequences would arise, which in their relation to the prevention of pleuropneumonia might be compared with those which attended the discovery of vaccination; for we should become possessed of a means of conferring immunity from the disease which would be free from those drawbacks which have hitherto thrown deserved discredit on the employment of prophylactic inoculation. He does not as yet venture to express the hope that such fruits as are here indicated will actually accrue from their efforts. It is obvious, he says, that the question is one which can only be settled by the further experiments which they are now preparing to carry out, *viz*, by subjecting those animals of which the blood and tissues have been already impregnated with the specific virus to circumstances which will thoroughly test their immunity. For this purpose, it is intended to place them one by one in stables occupied by diseased animals. (*British Medical Journal*, 1877.)