IS PERSISTENT OPAFICATION OF THE GALL BLADDER
ON CHOLECYSTOGRAPHY AN INDICATION FOR
CHOLECYSTECTOMY?

by

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THERE is a widespread reluctance amongst surgeons to undertake cholecystectomy on the basis of symptoms alone. These views derive from early studies suggesting an unacceptable incidence of the post-cholecystectomy syndrome in such cases.1 There is however, a well recognised group of patients with typical biliary tract symptoms and normal oral cholecystography ('stoneless symptoms') who pose considerable management problems. It has been suggested that the persistence of contrast medium in the gall bladder on a straight x-ray taken 24 hours after an otherwise normal cholecystogram is a reliable index of gall bladder dysfunction.2 Whilst more sophisticated techniques of demonstrating gall bladder function exist these are not universally available, outside specialist centres. The concept, that the simple, inexpensive, addition of one further x-ray, 24 hours after normal oral cholecystography might help to select out those with genuine gall bladder pathology, has considerable clinical appeal. The reliability of persistent opacification of the gall bladder in discriminating gall bladder pathology in the absence of calculi, has been assessed in a small series of patients.

PATIENTS AND METHODS

Between January, 1977 and December, 1980 twenty patients underwent cholecystectomy on the basis of convincing symptomatology and persistent opacification of the gall bladder. From an earlier review of the details of all patients undergoing cholecystectomy over this period, a comparable age/sex matched 'control' group was selected from those who underwent cholecystectomy on the traditional criteria of cholelithiasis. A data base was collected from careful review of case records, including operation notes, supplemented by a detailed questionnaire. The pathological diagnoses of the removed gall bladders were scrutinised by one pathologist. Complete sets of data were obtained on all patients with pursuit of equivocal details by a combination of telephone enquiry and home visit.

Mean values are accompanied by their standard deviations. Continuous variables were analysed by Student's paired t-test. Discontinuous variables were analysed using Chi-squared for discordant pairs.

RESULTS

Of the 20 gall bladders (17 female and 3 male) removed on the basis of delayed emptying (DE), 12 were reported as pathologically abnormal (DEpos) and 8 normal (DENeg). All the control group had abnormal pathology. The statistical analysis was conducted in two groupings. The 12 DEpos patients and 8 DENeg were separately
compared with their age/sex matched 'controls'. The mean ages in years were DEpos 40.2 ± 9.4 (control 40.0 ± 9.4), DEneg 37.3 ± 12.3 (control 37.5 ± 14.1).

Pre-operative symptomatology

The duration of pre-operative symptoms was significantly longer in the delayed emptying group of patients (regardless of the ultimate pathology of the gall bladder) than controls. DEpos = 93.5 ± 80.7 months; controls = 39.8 ± 36.6 months (t = 2.18, P = 0.05). DEneg = 72.8 ± 44.7 months, controls = 31.6 ± 22.6 months (t = 2.16, P = 0.06). Analysis of individual symptoms (Table I) revealed no difference in the type or distribution of pain between the groups. The incidence of nausea, flatulence, fat intolerance and heartburn was similar in the DEpos group and its controls. However, there was a pronounced difference in the incidence between the DEneg group and its controls.

TABLE I

Pre-operative symptomatology

|          | DE pos. | Control | DE neg. | Control |
|----------|---------|---------|---------|---------|
| PAIN     |         |         |         |         |
| Type:    |         |         |         |         |
| Constant | 6/12    | 8/12    | 4/8     | 5/8     |
| Colic    | 6/7     | 7/7     | 4/6     | 6/6     |
| Site:    |         |         |         |         |
| Epigastric alone | 1/2  | 2/2  | 0/1 | 1/1  |
| Epigastric radiating | 3/6 | 6/6 | 5/4 | 4/4  |
| R. Subcostal radiating | 8/4 | 4/4 | 3/3 | 3/3  |
| Nausea   | 9/12    | 8/12    | 8/8     | 5/8     |
| Flatulence | 9/12 | 9/12 | 8/8 | 5/8 |
| Fat intolerance | 10/12 | 8/12 | 7/8 | 4/8 |
| Heartburn | 6/12  | 7/12   | 3/8     | 5/8     |

Investigations

The traditional reluctance to accept symptoms as biliary in origin in the absence of demonstrable calculi or non-function, was reflected in the higher number of pre-operative investigations in the delayed emptying group. Twelve of the delayed emptying group had one normal oral cholecystogram prior to the series showing persistent opacification of the gall bladder; the remaining eight patients in the group had two such normal oral cholecystograms. Intravenous cholangiograms were also performed in two patients and ultrasound scan in one patient of this group with no abnormalities detected. The reliance on intravenous cholangiography as the alternative biliary tract investigation is a reflection of the time span of the study when ultrasound scanning was not as established as at present. Predictably more non-biliary investigations such as barium meal, gastroduodenoscopy, barium enema, IVP were also performed in the delayed emptying group. A total of 25 such investigations were performed on the 20 patients, compared to eight in 20 control patients.
Operative features

In the delayed emptying group there was poor correlation between the appearance of the gall bladder at surgery and the subsequently reported pathology. Ten out of the twelve pathologically abnormal delayed emptying gall bladders were considered macroscopically normal by the surgeon. Despite their non-visualisation on pre-operative cholecystography, small calculi were discovered in two of the DEpos and one of the DEneg gall bladders. Per-operative cholangiography was performed in all cases and exploration of the common bile duct undertaken in four control cases but in none of the delayed emptying group.

TABLE II
Patient assessment of surgical outcome

| Visick Grade: | DE pos. | Control | DE neg. | Control |
|---------------|---------|---------|---------|---------|
| 1 = Complete cure | 5 | 4 | 1 | 4 |
| 2 = Better but not perfect | 6 | 8 | Chi² = 0 | 6 | 4 |
| 3 = Unchanged | 1 | 0 | 0 | 0 |
| 4 = Worse | 0 | 0 | 1 | 0 |
| Pre-operative symptom score | 9.1 ± 2.5 | 7.3 ± 2.8 | t = 1.42 | 9.8 ± 1.8 | 7.8 ± 3.2 | t = 1.56 |
| (P = 0.18) | (P = 0.163) |
| Post-operative symptom score | 3.6 ± 3.6 | 2.8 ± 2.7 | t = 0.59 | 4.1 ± 3.4 | 1.9 ± 1.8 | t = 1.48 |
| (P = 0.57) | (P = 0.183) |

TABLE III
Post-operative symptomatology

| Post-operative symptoms | DE pos. | Control | DE neg. | Control |
|-------------------------|---------|---------|---------|---------|
| Pain | 6/12 | 3/12 | Chi² = 1.28 | 5/8 | 0/8 |
| (P > 0.2) | (P > 0.3) |
| Nausea | 4/12 | 2/12 | Chi² = 1 | 3/8 | 1/8 |
| (P > 0.3) | (P > 0.3) |
| Flatulence | 5/12 | 8/12 | Chi² = 1.28 | 7/8 | 3/8 |
| (P > 0.2) | (P > 0.2) |
| Fat intolerance | 4/12 | 4/12 | Chi² = 0 | 3/8 | 2/8 |
| (P > 0.5) | (P > 0.5) |
| Heartburn | 1/12 | 2/12 | Chi² = 0.3 | 1/8 | 4/8 |
| (P > 0.5) | (P > 0.1) |

Post-operative course

Post-operative complications were unremarkable; there was no wound sepsis or thromboembolism and only one instance of chest infection in a control patient. The duration of admission was shorter in the delayed emptying groups; DEpos 12.3 ± 3.3 days, controls 13.4 ± 5.1 days (t = -0.62, P = 0.54) DEneg 11.9 ± 0.8 days, controls 13.3 ± 2.1 days (t = 2.2, P = 0.06). A 'Visick type' grading of the
patients subjective assessment of surgical outcome suggested that both the DEpos and DEneg groups benefited from cholecystectomy (Table II). However, analysing specific symptoms revealed a higher incidence of residual symptoms in the DEneg group compared to DEpos and controls (Table III). The patients were asked to grade, pre and post-operatively, each of five specific symptoms, on a severity scale of 0-3. Pre and post-operative symptom score totals were then compared and a statistical evaluation made of the effect of cholecystectomy in reduction of symptom intensity (Table II). The delayed emptying group had higher pre-operative symptom score totals than controls. Surgery reduced the symptom score totals in all groups; however, the DEpos group appeared to derive more symptomatic benefit than the DEneg group.

**DISCUSSION**

Visualisation of gall bladder calculi or non-function are the established indications for cholecystectomy. There is, however, a sub-group of patients with convincing biliary tract symptomatology but no evidence of pathology on cholecystography. These patients pose well recognised and difficult management problems. They tend to undergo multiple investigations, in an attempt to define alternative aetiologies for their symptoms. Repeated oral cholecystography is often performed in the anticipation that calculi will be reported eventually.

Some doubt is being thrown on the traditional reluctance of surgeons to perform cholecystectomy on symptomatic grounds alone. It is too simplistic to link gall bladder pathology exclusively to the presence of calculi; clearly gall stones represent the end point of an evolving disease process. "Stoneless symptoms" are just as real as symptomless stones. Until fairly recently oral cholecystography introduced by Graham and Cole in the 1920's remained the major imaging technique. However, its limitations are considerable; it fails to diagnose 2-10 per cent of patients with calculi especially if supine and erect views are not taken. It is essentially a static gall bladder imaging technique and even when accompanied by a fatty meal fails consistently and reliably to demonstrate dynamic gall bladder function. Attempting to demonstrate persistant opacification endeavours to extend the role of the oral cholecystogram from a purely static to a functional dynamic imaging technique. In this series the technique accurately discriminated gall bladder pathology in 12 out of 20 patients, 60 per cent. The eight patients with normal gall bladder pathology might at first sight seem to be false positives for the technique. However, one of the group did have calculi and all the patients did claim benefit from surgery. It is possible that they represent some form of biliary dyskinesia. The term 'irritable gall bladder' has been coined for this disorder and one study has suggested that narrowing and kinking of the cystic duct is the underlying problem. Spasm of the sphincter of Oddi has also been incriminated.

More sophisticated techniques of dynamic gall bladder imaging are now available. The effect of cholecystokinin on the opacified gall bladder can indicate functional abnormalities. Radio-isotope hepatobiliary scanning with Technetium 99m labelled H.I.D.A. provides objective quantitative data on gall bladder function but is not widely available outside specialist centres.

The results of this limited retrospective experience suggest that demonstration of persistant opacification of the gall bladder may aid the selection of patients for
surgery from this group with "stoneless symptoms". A prospective study is in progress involving HIDA scanning of all patients demonstrating persistent opacification of the gall bladder and it is hoped this may provide further insight into the phenomenon.

SUMMARY

Twenty patients with symptoms highly suggestive of gall bladder disease but with normal routine cholecystograms, were subjected to cholecystectomy on the basis of delayed emptying of the gall bladder. This was defined as persistence of the contrast medium in the gall bladder 24 hours after the normal cholecystogram. Twelve of the gall bladders removed were pathologically abnormal, and two of these contained stones. One of the eight gall bladders reported pathologically normal also contained small calculi. The outcome in these patients was compared with age and sex matched controls with proven stones on cholecystography; the results of surgery were satisfactory in the two groups. It is suggested that evidence of delayed emptying on oral cholecystography may provide some further help in deciding on surgery in patients with typical symptoms but normal cholecystogram.

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