Hospital Topics

Ultrasound of the gall bladder: experience in a district hospital

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Abstract

In a retrospective survey performed to assess the reliability of ultrasound of the gall bladder in a district hospital the radiologists performing the examinations had little or no previous experience in non-obstetric ultrasound. In 142 patients who had the presence or absence of gall stones proved by surgery gall stones had been correctly predicted in 84% of patients with stones and absent in 64% of those without. This compares favourably with earlier reports from North America, and shows that ultrasound of the gall bladder is useful, even when staff experience is limited.

Introduction

Ultrasound is widely used in the investigation of suspected gall stones. Its accuracy has improved in recent years, especially in large centres with staff experienced in the technique. A recent leading article in the *BMJ*¹ emphasises that good results can be obtained only by "strongly motivated and highly experienced ultrasonographers."

Ultrasound is now being used in many hospitals where staff have had little or no training in non-obstetric abdominal ultrasound. Is it possible to achieve reliable results in these hospitals?

Patients and methods

A Searle PhoSonic B-mode ultrasound scanner was installed in a large district hospital in November 1978. Initially four, and later five, radiologists performed the scans. Two had had no experience of ultrasound, and the other three had had only limited non-obstetric training.

Until the end of 1979, 367 patients with suspected gall stones were scanned; these were all of the patients who had been referred for ultrasound examination of the gall bladder, with no exclusions because of obesity or age. Most scans were performed after oral cholecystography, either to confirm the findings, or after an unsuccessful examination or one giving equivocal results; in 35% of patients ultrasound was the initial biliary investigation. Patients were routinely starved for eight hours before ultrasound; scans were performed in both longitudinal and transverse planes, with oblique or intercostal scans when necessary; most examinations were done using a 3.5 MHz long internal focus probe, although 2.25 MHz or 5 MHz probes were used when appropriate.

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Standard criteria for the diagnosis of gall stones were used.^{2,3} Intracavity echoes with distal shadowing that move with gravity is the most reliable evidence of gall stones; non-shadowing echoes, or echoes that are not mobile, are less reliable signs. When the gall bladder is not visualised, high-level echoes in the gall bladder fossa with distal shadowing are evidence of calculi in a shrunken gall bladder. Two or more examinations were performed on 26 patients when diagnostic scans were not obtained on the first occasion. Real-time apparatus was not available during the period of this review.

Results

The findings are those on 142 patients who had had laparotomy (140 patients) or necropsy (2) since their original ultrasound examination (table I). Some 35% of patients had surgery within one month of ultrasound and 61% within three months; the longest interval to surgery was 13 months. In both patients with confirmation by necropsy this was within two months of ultrasound.

TABLE I—Ultrasound and surgical findings in 142 patients

Ultrasound findings	Surgical findings	
	Stones	No stones
Stones	89	3
No stones	5	23
Inconclusive	5	5
Failed	7	5

Calculi were reported at ultrasound in 92 patients. In 74 the gall bladder was shown with intracavity echoes, while in 18 it was not visualised, but a shrunken gall bladder containing calculi was diagnosed. Calculi were surgically confirmed in 89 patients, including the 18 in whom a shrunken gall bladder was reported. There were three false-positive examinations; in the first kinking of the gall bladder was misinterpreted as stones; in the second biliary mud was found at surgery, but no calculi; and in the third ultrasound had shown non-shadowing echoes. In the latter two patients calculi may possibly have passed spontaneously, but the errors were probably due to faulty interpretation.

The result of the ultrasound examination was reported as normal in 28 patients. Many of these had surgery for other conditions once biliary pathology had been excluded, and in all these the surgeon commented on the state of the gall bladder at surgery; however, in some patients cholecystectomy was performed despite the ultrasound report. The ultrasound finding was correct in 23 patients, but missed stones in five. In four of these a single calculus was found either in Hartman's pouch or in the cystic duct. This is often a difficult area to examine ultrasonically, and it is relevant that three of these errors occurred during the first four months after starting ultrasound. In three patients the presence of a dilated gall bladder suggestive of a mucocele might have alerted the radiologist to the possibility of a stone in the neck or cystic duct.

Ultrasound was inconclusive in 10 patients; in most of these in-

testinal gas partially obscured the gall bladder. Surgery showed that stones were present in five.

In 12 patients ultrasound was entirely unsuccessful, either due to obesity or bowel gas, or an unusually high position of the gall bladder. In seven patients stones were found. Repeat examinations were not performed on any of these patients.

Discussion

Oral cholecystography has been used to assess the accuracy of ultrasound but without definitive surgical proof of the diagnosis in every patient.⁴⁻⁶ But cholecystography itself may be misleading.⁷⁻⁸ It follows that the reliability of ultrasound can be assessed only in patients who have had surgery or necropsy. The present survey shows that ultrasound gave correct results in 79% of patients and incorrect in 6%, with an inconclusive or failed examination in 15%.

The surgeon, however, requires to know unequivocally whether gall stones are or are not present—failed or inconclusive results are of little clinical help. It is therefore useful to state the number of patients in whom stones or the absence of stones were correctly predicted. In this series calculi were correctly predicted in 89 out of 106 patients (84%), and their absence in 23 out of 36 patients (64%). These results may be compared with those of other workers, nearly all of which are from large centres in North America.^{2,3,8-22} With the same method of assessing reliability, the accumulated figures are given in table II.

TABLE II—Accuracy of predicting the presence or absence of gall stones in published series and in the present study

	Calculi correctly predicted	Absence of calculi correctly predicted
	(%)	(%)
1974-78 (520 patients ⁸⁻¹⁰) ..	83	69
1979-80 (1045 patients ^{3,14-22}) ..	92	80
Present survey (142 patients) ..	84	64

This shows that the results obtained during 1979 in a district hospital compare favourably with those of earlier reports. The accuracy of ultrasound had improved in the past two years, and further improvement will probably follow. Many of our inaccurate results may be ascribed to faulty interpretation, and we hope that in future there will be fewer failed or inconclusive scans. Real-time examinations may help in reducing these unhelpful procedures. A reasonably high degree of accuracy can be achieved in a district hospital, even with relatively inexperienced staff. As discussed,¹ in Britain oral cholecystography will probably remain the primary investigation of choice in most

patients with suspected gall stones, but this survey indicates that ultrasound can be used as a complementary procedure when cholecystography is not possible or its findings are non-diagnostic.

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Are there any hazards in using deodorant talcum powder? Are there any complications from long-term low-grade inhalation of such particles?

"Deodorant talcum powder" usually refers to a cosmetic dusting powder consisting largely of sterilised high quality talc (sometimes with kaolin or light chalk to improve absorbency), perfume, and an antibacterial compound to retard the degradation of apocrine secretion, which might otherwise give rise to malodour. Talcum powders are tolerated with few problems but with certain topically applied antimicrobials questions have arisen such as photosensitisation (bithionol) or toxicity after absorption (boric acid and hexachlorophane). A typical deodoriser would now be triclosan (Irgasan DP300), probably at 0.05-0.1%, which seems to be without hazard. After earlier anxieties over the antimicrobials extensive safety testing has been carried out for all likely routes of exposure, including inhalation, and for possible risk to infants. Doubts have occasionally been expressed on the long-term safety of talc, mainly in relation to possible asbestos contamination; cosmetic talc is now subjected to x-ray diffraction and other quality control tests to ensure freedom from detectable asbestos.¹ Foreign-

body granuloma is a theoretical risk, even with pure talc, but is not known to constitute a hazard with cosmetic talc in practice; a recent study² showed minimal levels of respirable talc particles during normal use, the highest level being 1.9 mg m⁻³.

¹ Cosmetic, Toiletory & Perfumery Association. TPF specification No 12A. CTPA, 1977.

² Aylott RI, Byrne GA, Middleton JD, Roberts ME. Normal use levels of respirable cosmetic talc: preliminary study. *International Journal of Cosmetic Science* 1979;**1**:177-86.

Do calcium supplements given to postmenopausal women affect the action of the heart?

The ionised calcium in the blood influences the action of the heart. The buffering capacity of the blood for calcium is such that slight increases in intake do not affect the ionised moiety. Calcium supplements given by mouth to postmenopausal women would therefore have no influence on the heart.