Reply

EDITOR.—In reply, I would like to state that, while we agree that sphincter of Oddi hypertension may be an important contributor to the phenomenon of acalculous biliary pain, the purpose of the CCK provocation test is to select patients who might benefit from cholecystectomy. Whether subselection can be made on the basis of sphincter of Oddi testing remains to be seen but, certainly, the CCK provocation test should not be recommended as a selection tool for symptom relief after a cholecystectomy.

A W MAJEED

Department of Surgical and Anaesthetic Sciences,
Royal Hallamshire Hospital,
Sheffield S10 2JF, UK

Cholecystokinin infusion and gall bladder dysfunction

EDITOR.—We read with interest the commentary by Al-Musawi and Williamson (*Gut* 1998;43:454–5) and the paper in the same issue by Smythe *et al* (*Gut* 1998;43:571–8). We agree with Al-Musawi and Williamson that six months is an inadequate follow up time, that identification of cystic duct abnormalities is important and in particular that cholecystokinin (CCK) scintigraphy is a more accurate technique than either ultrasound or oral cholecystography. We however disagree with their view that the CCK provocation test, based solely on the reproduction of pain, is of diagnostic value.

The value and accuracy of CCK scintigraphy has been well documented by several groups^{1–4} including our own.^{5–7} The true positive rates for all these studies are in the range 94–97%. Our most recently reported data⁷ are from an eight year prospective study of 235 patients, with follow up (mean 4.5 years) of all patients, surgical and non-surgical, with both normal and abnormal gall bladder ejection fractions. This demonstrates 96% sensitivity, 92% specificity and 95% overall accuracy for CCK scintigraphy in predicting gall bladder dysfunction and long term clinical outcome. These findings are in agreement with the 6% false negative rate obtained by Fink-Bennett and colleagues¹ in a retrospective study. In our series, abnormal cystic ducts were found in 12% of patients who underwent surgery, all of whom were symptom-free on long term follow up.

In their introduction, Smythe *et al* state that Yap and colleagues⁸ and ourselves⁷ claim some efficacy for the CCK provocation test. This is incorrect. Both papers clearly describe the efficacy of CCK scintigraphy and the measurement of gall bladder ejection fraction. We have never advocated pain reproduction as an indicator of gall bladder dysfunction. Despite using a fast (three minutes) infusion of CCK,⁸ thought to be more likely to induce pain and cause spasm of the cystic duct, we have found no correlation between the reproduction of pain following CCK infusion and either gall bladder ejection fraction or subsequent surgical outcome.⁷ We agree with Smythe *et al* that pain reproduction following CCK infusion is not a diagnostic predictor.

Our experience of using CCK scintigraphy in over 300 patients over a 10 year period (manuscript in preparation) is that an abnormal gall bladder ejection fraction is highly predictive of gall bladder dysfunction and is a

good predictor of long term clinical outcome following surgery.

CCK scintigraphy is an accurate, objective technique and in our view should be the investigation of choice for suspected gall bladder dysfunction in patients without gallstones.

G W MIDDLETON

Principal Physicist,
Department of Medical Physics and Clinical
Engineering,
University Hospital of Wales,
Heath Park,
Cardiff CF4 4XW, UK

J H WILLIAMS

Consultant Radiologist,
Department of Radiology,
Princess of Wales Hospital,
Coity Road,
Bridgend CF31 1RQ, UK

- 1 Fink-Bennett D, DeRidder P, Kolozsi WZ, *et al*. Cholecystokinin cholecystigraphy: detection of abnormal gallbladder motor function in patients with chronic acalculous gallbladder disease. *J Nucl Med* 1991;32:1695–9.
- 2 Misra DC, Blossom GB, Fink-Bennett D, *et al*. Results of surgical therapy for biliary dyskinesia. *Arch Surg* 1991;126:957–60.
- 3 Yap L, Wycherley AG, Morphet AD, *et al*. Acalculous biliary pain: cholecystectomy alleviates symptoms in patients with abnormal cholecystigraphy. *Gastroenterology* 1991;101:786–93.
- 4 Watson A, Better N, Kalfi V, *et al*. Cholecystokinin (CCK)-HIDA scintigraphy in patients with suspected gall-bladder dysfunction. *Australas Radiol* 1994;38:30–3.
- 5 Middleton GW, Williams JH. Is gall bladder ejection fraction a reliable predictor of acalculous gall bladder disease? *Nucl Med Commun* 1992;13:894–6.
- 6 Middleton GW, Williams JH. Detection of acalculous gall bladder disease using Tc^{99m} EHIDA imaging and cholecystokinin. *Eur Radiol* 1994;4:462–3.
- 7 Middleton GW, Williams JH. Diagnosis of acalculous cholecystitis using Tc^{99m} HIDA imaging – a long term follow-up study. *Eur Radiol* 1997;7:S84.
- 8 Middleton GW, Williams JH. Fast or slow cholecystokinin infusion Tc^{99m} HIDA imaging [letter]? *Australas Radiol* 1995;39:100.

Ductal dilatation and stenting for residual hepatolithiasis

EDITOR.—Sheen-Chen *et al* (*Gut* 1998;42:708–10) have advocated the use of ductal dilatation and stenting through a T-tube tract followed by choledochoscopic stone retrieval in patients with residual postoperative hepatolithiasis and intrahepatic strictures. The total number of procedures (percutaneous duct dilatation, stent placement and choledochoscopic stone extraction) per patient ranged from four to 11 (median 8). No mention is made of the length of time, length of hospital stay or total cost from initial surgery to completion of the above procedures and ultimate stone clearance. Surprisingly, the authors have not cited their two previous papers on the technique.^{1,2} While undergoing repeated percutaneous biliary intervention, patients have the discomfort and inconvenience of external T-tubes and stoma appliances to control the invariable and distressing bile leakage around the external catheters. The strategy proposed by Sheen *et al* also does not provide access to the intrahepatic ducts if recurrent calculi develop later after removal of the T-tube.

In order to avoid these hazards and minimise the incidence of incomplete operative stone removal and to facilitate extraction of recurrent intrahepatic stones, we have used meticulous intra-operative techniques to clear stones and create a biliary access loop to

Figure 1 Jejunal access loop marked with metal clips.

deal with recurrent stones. Full exposure of the hepatic duct bifurcation is obtained at operation and intra-operative ultrasound, cholangiography and cholangioscopy are used to locate and map the site and extent of segmental duct stones. Accessible segmental duct strictures are widened by surgical ductoplasty and impacted stones extracted.³ When peripheral segmental ducts beyond the reach of conventional operative cholangioscopy are involved, intra-operative radiological manipulation with a balloon to dilate strictures and a basket to extract recalcitrant stones is used. If substantial parenchymal atrophy has occurred, or multiple cholangitic abscesses are present, the involved segment or lobe is resected in addition to duct drainage and creation of the access loop. Usually only a left lateral segmental resection is required.

Percutaneous transjejunal biliary intervention has become an integral part of the multidisciplinary management of complex intrahepatic strictures and stones since the initial descriptions by Fang and Chou,⁴ Barker and Winkler⁵ and Hutson *et al*.⁶ The original cutaneous stoma has been replaced by a subparietal jejunal loop.⁷ In 21 patients with residual or recurrent intrahepatic stones we achieved successful intrahepatic biliary access in 95 (98%) of 97 puncture attempts.⁸ Several technical points in the jejunal loop construction are useful to create a loop which is easy to identify and enter. The access limb should be short and straight between the hepaticojejunal anastomosis and site of subparietal fixation. The terminal 4 cm of the bowel is sutured to the peritoneum of the anterior abdominal wall and marked with a parallel row of metal clips to provide "runway lights" for radiological identification and puncture (fig 1). The subparietal attachment and clear marking of the loop simplify identification and allow consistently successful percutaneous entry. In difficult cases the use of high frequency ultrasound facilitates identification of the surgical clips and the needle tip during entry into the access loop. Two additional clips on either side of the hepaticojejunostomy are useful to identify the site of the anastomosis.⁷

As an alternative to expensive electrohydraulic lithotripsy a vascular snare used as a cheese-cutter facilitates stone fragmentation and removal in patients with soft calculi. If stones recur, as they often do, the entire