studies will be needed. However, Keller *et al* suggest that this change in ratio of apoptosis between the crypt base and surface may be a useful intermediate biomarker for studying the efficacy of chemopreventive agents of colorectal tumorigenesis. This is a bold claim as the accurate assessment of apoptosis in human colonic biopsy samples is notoriously hazardous. The authors report that the mean number of crypts counted in each patient was 12.74. Apoptosis is so heterogeneous that to obtain reproducible data in the mouse colon, at least 200 perfectly orientated half crypt sections must be quantified. Nevertheless, the concept of NSAIDs increasing cell shedding at the mucosal surface is an appealing one and should stimulate future studies aimed at validating its usefulness as a biomarker in humans.

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Post-cholecystectomy diarrhoea: a running commentary

Since laparoscopic cholecystectomy eclipsed the open procedure in the early 1990s there has been a worldwide increase in annual cholecystectomy rates of between 20% and 50%.[1 2] This has occurred despite a lack of evidence that gallstone incidence has increased to the same degree. Laparoscopic cholecystectomy has a lower mortality rate than open cholecystectomy, but in view of the increased cholecystectomy rate, there may be no decrease in the total number of deaths associated with this operation.[1] Changed indications for a safer procedure and patient or physician induced demand may explain the increased cholecystectomy rate. Patients and doctors may have a lower threshold for tolerance of gallstone associated symptoms than in the pre-laparoscopic era. As gallstones may be associated with a spectrum of symptoms, from none at all to those associated with life-threatening complications, in many instances the decision to operate may be arbitrary. This is especially so as the large majority of gallstones are asymptomatic, and these are best left undisturbed.[3]

Patient surveys two to 24 months after both open and laparoscopic cholecystectomy indicate that 40–50% of patients have persistence of one or two symptoms such as flatulent dyspepsia or dull abdominal pain, although 80–90% regard the operation as highly successful.[4 5] Careful surveys carried out before and after surgery indicate that 13% of patients have persisting biliary type pain.[6] Although it is easy to formulate a definition of biliary type pain for research purposes, the characteristics of pain caused by gallstones are still uncertain.[7]

Apart from the issues of procedure related mortality, changing indications for surgery, and symptom relief, there is much concern about post-laparoscopic cholecystectomy morbidity in the form of bile duct injuries. Major (2.1% *v* 3.2%) and minor (5.9 *v* 9.8%) postoperative complications occur less frequently with laparoscopic surgery. However, major bile duct injuries occur in about 0.33–0.5% of laparoscopic operations, compared with about 0.06% of open procedures.[8]

A small but important number of patients complain of diarrhoea in the long term after cholecystectomy. In a retrospective telephone survey of 148 patients who had had a cholecystectomy four years previously, 12% described a major change in their bowel habit with more than three and up to six watery bowel movements daily.[9] Other reports indicate that when patients are questioned about their bowel habits after cholecystectomy, between 5% and 8% answer that they have diarrhoea. Retrospective surveys, however, have drawbacks and questions remain regarding whether the cholecystectomy itself caused the diarrhoea, whether there was diarrhoea preoperatively, and whether what the patient describes as diarrhoea is real diarrhoea or just increased frequency of defecation. In this issue (see page 889) Hearing *et al* tackle these questions in a prospective survey of symptoms and measurements of bowel function before and after surgery in 106 adults. Patients estimated that their bowel frequency increased by a median of one bowel movement per week but measurements of interdefecatory interval and whole gut transit time using the Bristol Stool Form score did not change significantly. Two of three patients who had stated that they had diarrhoea usually or always before surgery reported a deterioration in their diarrhoea after surgery. In six patients who stated that they had diarrhoea usually or always postoperatively, five had perceived that they had less frequent diarrhoea or no diarrhoea at all preoperatively. Thus five patients either experienced a deterioration in their perception of diarrhoea or perceived that they had developed diarrhoea for the first time postoperatively. The situation is even more difficult to interpret as at least two of the five patients who had a perceived deterioration their

diarrhoea or who had perceived that they had developed diarrhoea for the first time postoperatively, may have had irritable bowel syndrome pre- and postoperatively. Objective measurement of diarrhoea using interdefecatory interval and stool form in these five patients failed to show evidence of diarrhoea, except perhaps in one. Although Hearing *et al* did not show a difference in whole gut transit time after cholecystectomy using the stool form technique, it has been shown previously using a radio-opaque pellet method that whole gut transit time is shortened by about 20% as a consequence of the operation.[9] Fortunately, cholecystectomy has a desired side effect for patients with perceived constipation preoperatively, most of whom feel relieved of this annoyance postoperatively.

What are the take home messages? 13–40% of patients have persisting abdominal pain after cholecystectomy although the vast majority regard their operation as a success. Up to 12% of post-cholecystectomy patients when questioned feel that they have diarrhoea as a consequence of their operation, and at least 4–5% of patients have a definite deterioration in their perceived diarrhoea or perceive that they have developed diarrhoea for the first time. Objective assessments postoperatively, however, rarely demonstrate new onset diarrhoea. Some of these patients may have the irritable bowel syndrome. Whether mean orocaecal transit time becomes faster postoperatively is still in doubt and this requires further study. Severe, high volume diarrhoea does not seem to occur as a consequence of cholecystectomy and if it does it is extremely rare. When faced with a patient with possible post-cholecystectomy diarrhoea, clinicians would be well advised to consider the irritable bowel syndrome and assess the situation objectively at the outset with records of defecation frequency, stool form, and assessments of orocaecal transit time and stool weight.

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