LETTERS TO THE EDITOR

Relation between electromyography and anal manometry of the external anal sphincter

SIR,—Sørensen *et al* (*Gut*, 1991, 32, 1031–4) seek a relation between electromyography (EMG) and anal manometry of the external anal sphincter and compare the effectiveness of the invasive concentric needle technique with that of two non-invasive ones, a sponge electrode and a hard anal plug electrode. The amplitude of the EMG signal measured with the hard anal plug electrode was much less than that measured with the sponge electrode. They assumed that the sponge electrode had better contact in the anal canal than the hard anal plug electrode.

We would like to point out a further factor that may be important in EMG recording from striated muscle by the sponge and hard anal plug electrodes. We note in the article of Sørensen *et al* that the hard anal plug has electrode plates orientated circularly. It is accepted that bipolar surface electrodes must be placed, for recording from striated muscle, in the direction of the muscle fibres because of the increased longitudinal conductivity of the muscle.¹ Each electrode should be connected to either side of a balanced amplifier with a third electrode connected to earth.² The two electrodes of the anal plug should then be placed, equally separated, on the circumference of the plug with the plates on the long axis.

We have compared two non-invasive plug electrodes: one of these had a circular and the other longitudinal orientation of their metal plates. A much greater EMG signal was recorded from the external anal sphincter both at rest and during voluntary contraction with the longitudinally orientated plates electrode.³ The anal plug electrode with longitudinal plates has also been compared with invasive wire electrodes and has shown a significant correlation between the rectified integrated EMG voltage obtained from the external sphincter during resting, squeeze, and strain manoeuvres. This emphasises the importance of the orientation of the electrode plates in recording the external anal sphincter EMG.

The orientation of the electrode plates in the sponge electrode illustrated by Sørensen *et al* seems to be a longitudinal one and is the one which showed good correlation with anal manometry. In contrast, there was no correlation with the EMG voltage obtained by the hard anal plug (circular plates) electrode used by them and anal manometry, as might have been expected from the first principles of EMG recording. Perry *et al* (1988) have also advocated a hard anal plug electrode with a longitudinally orientated plate.⁴ Furthermore, we have shown that it can be used highly effectively in recording the sphincter EMG in anismus and in measuring the latency of the pudendo-anal reflex.⁵

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Reply

SIR,—We have used the hard anal plug electrode for a number of years in investigating patients with defecation disorders. However, in patients with faecal incontinence the electromyographic (EMG) recordings with this electrode were of poor quality, which is why we started to use the sponge electrode as well. Our results show, that the sponge electrode is the better of the two electrodes in discriminating between incontinent and continent patients and we suggest that this is due to a better signal/noise relation, probably because of better electrode contact.

Binnie *et al* (*Int J Colorect Dis* 1991; 6: 5–8) have shown that the orientation of the electrodes is important in recording anal EMG. However, the sponge electrode we used has two circular pick-up plates with a diameter of approximately 5 mm which is why it is impossible to conclude anything about the significance of the orientation of the electrode. We carefully place the electrode in the anal canal with the pick-up plates situated at 3 and 9 o'clock where the external sphincter is widest. Binnie *et al* apparently placed their electrodes at between 6 and 12 o'clock. This position will include EMG signals from the puborectal muscle as well, which explains the good results obtained in patients with anismus.

We conclude that the hard anal plug electrode should not be used: the results of Binnie *et al* confirm this.

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Septicaemia after colonoscopy in patients with cirrhosis

SIR,—Thornton and Losowsky highlight an important problem in their article 'Septicaemia after colonoscopy in patients with cirrhosis' (*Gut* 1991; 32: 450–1). However, the role of endotoxins in this condition was not mentioned. Endotoxins are important bacterial factors for the development of the clinical syndrome of Gram negative septicaemia,¹ and have been shown to produce independently biological effects of this condition.² Endotoxins have been detected in venous blood of >50% of patients after colonoscopy, but produce no clinical effects in the presence of normal liver function.³ However, portal systemic shunting in the cirrhotic patient may allow much higher levels of endotoxin to reach the systemic circulation, leading to the clinical symptoms associated with septicaemia. Antibiotic therapy may further liberate endotoxins bound to the bacterial cell membrane,⁴ leading to deterioration in the clinical condition of a susceptible patient. Therefore, should cirrhotic patients

undergoing colonoscopy receive prophylaxis not against bacteria with antibiotics but against endotoxaemia using Centoxin (human monoclonal IgM antibody targeted against endotoxin)?

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Reply

SIR,—We thank Mr Welch and Mr Durrans for their interest in our paper. We did consider discussing endotoxaemia after colonoscopy but did not do so as we felt it had not been shown to be of definite clinical importance. Thus, while there is evidence that systemic endotoxaemia is more frequent after colonoscopy in patients with liver disease, this has not been found to be associated with any detectable clinical consequences in the absence of bacteraemia.^{1,2}

Mr Welch and Mr Durrans suggest that in patients with cirrhosis undergoing colonoscopy, prophylaxis with anti-endotoxin therapy (Centoxin) may be preferable to antibiotics. We feel that if prophylaxis is to be given, antibiotics are more likely to be effective in preventing serious sequelae and, as Centoxin costs £2200 each dose, antibiotics are much the cheaper option.

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BOOK REVIEWS

An atlas of rectal endosonography. By J Beynon, G Feifel, U Hildebrandt, and N H McC Mortensen. (Pp 111; illustrated; DM 175.) London: Springer Verlag, 1991.

Rectal endosonography is proving to be a very useful method for assessing malignant as well as non-malignant disorders. This book provides a simple and useful guide to ultrasonographic imaging of the anorectum. The technique of rectal endosonography is well described. The images are clear and examples

of the different stages of rectal cancer have been well illustrated. The examples of hyperechoic and hypoechoic node enlargements are somewhat confusing, as it is difficult to distinguish between the two in the examples shown. Perhaps a few examples of tumour invasion into the sphincters could have been included to help the reader when assessing patients for sphincter saving surgery.

The book is very well written and makes easy reading. Any young surgeon who reads it from beginning to end will have a very good grasp of rectal endosonography.

D KUMAR

A colour atlas of liver disease (2nd ed). By S Sherlock and J A Summerfield (Pp 248; illustrated; £50.) London: Wolfe Publishing, 1991.

This book is a pleasure to look through. It contains 636 figures, mostly in colour, of liver biopsy specimens, x rays, ultrasound scans and computed tomograms, clinical and laparoscopic photographs, as well as simple graphs and temperature charts. All have been well chosen from a wide variety of sources to illustrate almost every type of liver disease, including such topical subjects as transplantation, AIDS and hepatitis C. A few lines of explanatory text accompany each picture. The standard of colour printing is uniformly high.

This atlas was first published in 1979, and its success has led to a completely revised and updated second edition, with 150 new illustrations. There are 14 chapters, beginning with the clinical examination of the liver and biliary system and moving on through hepatitis, cirrhosis, cholestasis, and tumours to less common hepatic disorders such as vascular and storage diseases, infections and trauma. Anyone who proceeds through the atlas from cover to cover will glean a great deal of knowledge, but its real place is as a companion to the senior author's best seller, *Diseases of the liver and biliary system*, now in its 8th edition.

I suspect that its illustrations will provide the source for many a collection of hepatology teaching slides around the world's medical schools, despite the laws on copyright!

P M SMITH

Irritable bowel syndrome. Edited by N W Read. (Pp 226; illustrated; £35.) Oxford: Blackwell, 1991.

Two trends in modern thinking about irritable bowel syndrome are that it is best defined and classified in terms of its symptoms and that in many people it is the somatic expression of psychological distress. This book bucks both these trends, its emphasis being on somatic mechanisms and explanations. The opening chapter expounds the editor's conviction (which I share) that disordered sensitivity is more important than disordered motility in most patients. They have a neurotic or inappropriately aroused bowel. This is the main theme of the book.

The centrepiece is a big review by P L R Andrews, a physiologist, of the afferent mechanisms of the gut. His emphasis is on how understanding these mechanisms could lead to drugs which can modify them and relieve symptoms. I read this chapter with great interest but also mounting awe at the complexity of the area and the embryonic state of our knowledge. The idea of a magic bullet seems a

little naive. I wish Andrews had commented on the chapter after his which summarises the challenging findings of Whorwell's group that hypnotherapy relieves irritable bowel syndrome symptoms and reduces rectal sensitivity.

There are well written but, to me, unconvincing chapters on immune mechanisms and mastocytosis, and Hunter airs his ideas on altered colonic microflora and food intolerance.

All in all, this is an interesting collection of essays and there is much for the aficionado, but I fear the beginner might end up bewildered. Some chapters read like transcribed conference talks (though this is not admitted).

K W HEATON

Ulcerative colitis. Edited by C A O'Morain *et al.* (Pp 193; illustrated; £72.50.) Boca Raton: CRC Press, 1991.

So much has been, and is being, written on ulcerative colitis that the justification for yet another monograph seems hard to find. Indeed, it can only rest on whether it succeeds in giving new perspectives rather than providing yet another review.

This book, edited by Colm O'Morain, encompasses most aspects of the disease. The first eight chapters (of a total of 15) cover aetiological and pathogenetic mechanisms. Some of these are excellent contributions and I particularly enjoyed Rao and Read's chapter on motility disturbances and McCall and Boughton-Smith's review of animal models. Reviews of adhesive *Escherichia coli* (Burke and Axon) and colonic mucus (Cope, Heatley, Kelleher) are also useful.

The remaining seven chapters deal with clinical and therapeutic aspects and are disappointing. Histopathology is included but there are no chapters on radiological or colonoscopic aspects. This is perhaps surprising, especially as a very 'undergraduate' chapter on clinical symptoms and signs is included. This latter chapter also covers complications and extra-intestinal manifestations but is incomplete and uncritically persists in discussing pericholangitis, chronic active hepatitis, and primary sclerosing cholangitis as distinct entities occurring in association with ulcerative colitis. Possible mechanisms linking colonic inflammation with skin, joint, eye, and liver disorders are not discussed. The chapter on medical treatment contains statements that many of us would disagree with and rearrangement of the text by editorial processing has led to some anomalies. The chapter on surgery for colitis (O'Connell and Keane) is a useful précis of restorative procedures and their problems. However, pouchitis is covered in only a few lines, which will be frustrating for those seeking guidance on the clinical management of difficult cases, and neglects the potential for using pouchitis as an *in vivo* model of ulcerative colitis itself.

At £72.50 for 193 pages, this book is not cheap. Is it worth it? Certainly it contains much useful information but very little in a form that cannot easily be found elsewhere. There is some repetition between chapters and some chapters are remarkably turgid in style with few headings. It is a pity that many of the areas of current interest, whether in pathogenesis or treatment, are not covered. Nevertheless, I am glad to have the book on my shelves and will undoubtedly use it as a source of references.

D P JEWELL

Normal and abnormal swallowing. Imaging in diagnosis and therapy. Edited by Bronwyn Jones and Martin W Donner. (Pp 235; illustrated; DM 220.00.) Berlin: Springer-Verlag, 1991.

This book describes the role of imaging procedures in deciphering the mechanisms of normal and abnormal swallowing, including ultrasound, computed tomography, and magnetic resonance as well as conventional spot films, 16 mm cine, and videotaping. Anatomy, physiology, mechanisms of pharyngeal and oesophageal propulsion, and interpretation of the dynamic radiological study are usefully summarised and well illustrated. Special consideration is given to the increasing prevalence of swallowing problems in children, neurological disease, the elderly, and as a consequence of surgery.

The value of time spent taking a history is emphasised but the table of 'important history data' is naive and inadequate. The authors stress the importance of tailoring the mechanisms of the examination – for example position of the patient and type of bolus – to the problem the patient describes. They also stress the importance of examining the whole of the pharynx and oesophagus because both the localisation of a site sensation and the interpretation of the mechanism of production of a sensation by the patient are unreliable, so that oesophageal lesions commonly present with what seem to be pharyngeal symptoms. The 'Tailored examination' is a valuable contribution, although the authors do not specify techniques for paraesthesiae such as 'boiled sweet syndrome' or 'tender oesophagus', or the use of radio-opaque tablets of various sizes to measure the length and bore of obstructions and to locate them.

Differences in beliefs will persist across the Atlantic for many years yet, but this is a thoughtful book which succeeds in its aim of improving understanding of a difficult and still mysterious section of the gastrointestinal tract. It continues the long tradition of the Johns Hopkins Radiology School and bears the thumb print of its current doyen, Martin Donner. A book for clinicians as well as radiologists.

D A W EDWARDS

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NOTES

Clifford Hawkins Memorial Fund

Dr Clifford Hawkins (1915–91) made a wide range of contributions to clinical medicine,