

specimens. In ulcerative colitis, for example, there is a pronounced thickening of the muscle layers of the colon with loss of the haustral pattern. In Hirschsprung's disease the muscle layers proximal to the aganglionic segment hypertrophy, whereas in many surgical specimens of idiopathic megacolon there is a pronounced atrophy of the muscle layers. However, the aetiological significance of the muscle abnormality of diverticular disease and other colonic conditions is unlikely to be solved until our present ignorance of the normal anatomy and physiology of the colonic muscle has been remedied.

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## The Effect of Morphine in Diverticulosis of the Colon [Summary]

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It has been suggested that diverticulosis of the colon may be the result of abnormal intracolonic pressures and this hypothesis was tested by measuring the pressures in the human sigmoid colon both in health and in diverticulosis. The effects of certain drugs were also studied. Simultaneous cine-radiography was employed to determine the mechanism responsible for pressure production.

The intrasigmoid pressures were recorded with open-ended water-filled polythene tubes which were connected to a Cambridge multi-channel pressure recorder. Recordings were made for a period of one hour under basal conditions and for a further hour after the administration of a drug.

#### Results

- (1) Under basal conditions the pattern of pressure in the normal sigmoid colon was essentially the same as the pattern obtained from the sigmoid affected by diverticulosis.
- (2) After morphine had been given, the normal colon produced more waves of pressure; these seldom exceeded 20 mm Hg in height. In the colon with diverticula, non-affected parts of the sigmoid behaved like the normal colon but those segments that bore diverticula responded to morphine by

producing an excessive number of waves of high intracolonic pressure.

- (3) The high pressures that followed the use of morphine were seen on occasions to distend diverticula to a great extent.
- (4) Pethidine did not increase either the number of pressure waves or their dimensions.
- (5) Cine-radiography combined with intraluminal pressure recording revealed that when high pressures were being produced, the colon was divided into segments by contraction rings. When these segments contracted, their contents were not free to escape and high pressures developed in the segments. Morphine caused the colon to segment and to generate high pressures.

#### Conclusions

- (1) Segmentation converts the colon into a series of segments or 'bladders' whose outflow is obstructed so that high localized pressures develop. This mechanism appears to be the final common path whereby high localized pressures are produced regardless of the stimuli which evoke them. The similar structure of vesical and colonic diverticula is thus explained.
- (2) Morphine evokes high intracolonic pressures which render the drug potentially dangerous in acute diverticulitis and which would tend to disrupt anastomoses in the colon. Pethidine does not have this effect and would appear to be the analgesic of choice in acute diverticulitis.

#### REFERENCE

- Painter N S (1962) MS Thesis. University of London

The following papers were read and will be published in a later issue of *Proceedings*:

#### Juvenile Polyps

Mr Ian Todd (*St Mark's Hospital, London*)

#### Wound Infection in Surgery of the Colon and Rectum

Mr P F Jones, Dr H G Smylie  
 & Mr L W Baker (*Aberdeen Royal Infirmary*)

The following papers were also read:

#### Malignant Melanoma of Anal Canal

Dr P G H Volkstädt (*St Mark's Hospital, London, and University School of Erlangen, West Germany*)

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- Morson B C & Volkstädt P G H (1963) *J. clin. Path.* 16, 126  
 Volkstädt P G H & Morson B C (1963) *Arch. klin. Chir.* 302, 194

#### In vitro Study of Human Colonic Muscle

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(Meeting to be continued)