Diverticulitis of the right colon – experience from Hong Kong

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Abstract
Diverticulitis affects the right side of the colon more commonly than the left side in the Far East. A consecutive series of 35 patients (mean age 44 years) with right sided diverticulitis seen at this hospital is presented. All had localised pain in the right iliac fossa but systemic upset was uncommon. All but one were thought to have acute appendicitis. Thirty one were explored through a right iliac fossa incision but in more than half this had to be closed and a full laparotomy performed. A correct diagnosis was then made at the time of surgery in 28 (80%). Five patients underwent simple diverticulectomy, the remainder having a right hemicolectomy. On histological analysis most (26) had a single false diverticulum. All patients made a satisfactory recovery from surgery.

In western countries, diverticular disease remains one of the commonest of colonic afflictions. The problem generally occurs on the left side of the colon – indeed right sided disease probably accounts for less than 5% of the total.¹ In the Far East, however, the situation is very much the reverse – a recent report suggests that up to 76% of diverticulosis in Hong Kong affects the right colon (C Metreweli, personal communication). The aetiology of the two diseases is said to be dissimilar; left sided disease is a result of long standing high pressure changes in the colon, usually because of constipation, and right sided disease is usually congenital and thus these diverticula are ‘true’ – that is, contain all layers of the bowel wall, including muscle.² We review our experience of right sided diverticulitis in relation to the clinical and pathological manifestations.

Methods
Thirty five Chinese patients with right sided diverticulitis were identified from the records of our teaching hospital since its opening in 1984. Their notes were reviewed and details of presenting symptoms and signs, pre- and peroperative diagnosis, procedure performed, outcome, and histology were analysed. The ages of all patients

who had appendicectomy for acute appendicitis in our hospital during the same period were also retrieved from the hospital records.

Results
The 35 patients (25 men and 10 women) had a mean age of 44 years (range 19–72). Details of their presenting symptoms and signs are shown in Table I. All except one had abdominal pain localised to the right iliac fossa, although only 20 (56%) gave a history of preceding generalised abdominal pain. Over half had had symptoms for more than two days before presentation to the hospital. Systemic upset was uncommon – only five had either nausea or vomiting and only eight had diarrhoea. Fourteen patients had a fever of more than 37°C and all of these also had a leukocytosis. A further nine patients had a leukocytosis without concomitant fever. Fourteen patients (40%) had neither nausea, vomiting, diarrhoea, nor fever. None of the patients had had a previous appendicectomy, and all except one went to operation within 24 hours of hospital admission with a clinical diagnosis of acute appendicitis. The exception was a patient who had undergone a previous gastrectomy for carcinoma of the stomach and in whom the preoperative diagnosis was subacute obstruction caused by recurrence or adhesions. Four of the 35 patients underwent a laparotomy through a midline or paramedian incision from the outset (Table II). Thirty one patients were initially explored by a conventional gridiron incision (or equivalent) but in over half (16) this was closed and a subsequent vertical laparotomy incision made for the required resection. Eleven of the 31 with initial gridiron incisions required this to be extended medially and laterally – thus in only four patients was a local right iliac fossa incision sufficient for the required surgical procedure. At operation, the correct diagnosis was made in 28 patients (80%). The other seven had a

TABLE I Presenting symptoms and signs

Features	No	(%)
Generalised abdominal pain	20	(57)
Right iliac fossa pain	34	(96)
General + right iliac fossa pain	18	(52)
Pain for >2 days	20	(57)
Nausea/vomiting	5	(13)
Diarrhoea	8	(22)
Leukocytosis only	23	(65)
Leukocytosis + fever	14	(39)

TABLE II Details of surgery performed on the 35 patients

	No	(%)
Initial incision:		
Vertical laparotomy	4	
Right iliac fossa	31	
Diagnosis at surgery:		
Diverticulitis	23	(65)
Diverticular perforation	4	(13)
Probable carcinoma	8	(22)
Operative procedure:		
Right hemicolectomy	21	(61)
Limited right hemicolectomy	9	(26)
Diverticulectomy	5	(13)
Conversion of right iliac fossa incision:		
Changed to vertical laparotomy	16	(52)
Extended medially and laterally	11	(35)

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‘working’ diagnosis of carcinoma of the caecum. Thirty patients then underwent a right hemicolectomy, although in nine this was described as ‘limited’. The other five patients had a simple diverticulectomy.

Except for three patients who developed a minor wound infection, all had an uncomplicated postoperative course and left hospital within 10 days. One patient was admitted three years later with presumed adhesive small bowel obstruction which settled on conservative management.

On histological analysis, 24 patients (69%) had a single acquired diverticulum. Five had a single true diverticulum and the other six had false multiple diverticula. In no specimen was thickening of any of the muscular layers of the bowel wall identified.

Discussion

Right sided diverticulitis is invariably confused with appendicitis and even at operation, an accurate diagnosis is not always made.³ We believe that there are certain pointers which may help to differentiate the groups:

(1) Patients with right sided diverticulitis tend to be older than historically reported cases of appendicitis.^{3,4} We compared the age distribution of patients in this series with all patients in our hospital who had appendicitis during the same period and confirmed this (Fig).

(2) Systemic symptoms and signs are less common in right sided diverticulitis patients. Twenty four of our patients (69%) had neither nausea, vomiting, fever, nor leukocytosis.

(3) Some racial groups have a higher incidence of right sided diverticulosis – that is, those from the East.

In addition, over 70% of patients in this series were male, a sex bias which has also been shown in the United States and which contrasts with acute appendicitis.³ There are, however, many other reports which testify to right sided diverticulosis having a similar incidence between the sexes, so that this differential probably carries little significance, despite our own findings.⁴⁻⁷

As a further aid in diagnosis, some have argued for contrast enema studies,⁸ ultrasound⁹ or computed tomography,¹⁰ claiming greater diagnostic accuracy, but this would increase workloads on already stressed radiology departments, especially ‘out of hours’. Therefore, although clinical

suspicions may be alerted, the great majority of patients who present with localised right iliac fossa pain and tenderness of more than a few hours duration will be, and probably should be, subjected to appendicectomy.

In cases where a previous appendicectomy has been performed, the situation is clearly different. It was fortuitous that none of our patients presented with this medical history, but these may be the cases where radiology would be especially useful, given also that the clinical prodrome of right sided diverticulitis is more prolonged, allowing more time for investigations to be carried out.³

At surgery, the surgeon is confronted with a predicament. The problem is whether or not to resect and if so, how much. All our patients underwent resection – either a simple diverticulectomy, a limited right hemicolectomy, or a more radical resection. Some have advocated that right sided diverticulitis can be treated much as left sided disease, with antibiotics and possibly intraperitoneal drainage, but without resection.¹¹ Such an approach assumes a confident diagnosis of non-malignant disease and we question how often this is feasible in the operating room, even with thorough mobilisation and careful palpation.¹² Clearly, however, a policy of as limited a resection as possible – including simple diverticulectomy in cases of single isolated lesions – is sensible when a diagnosis of diverticulitis is strongly favoured.

Examination of the resected specimen before closure to check for mucosal lesions should give extra reassurance and allow for a more radical clearance if necessary.

Early studies of right sided diverticulitis suggested that most were true diverticula – that is, containing all layers of the bowel wall.^{2,13} Subsequent workers have strongly refuted this and the balance of opinion now seems to support the view that most are acquired.¹ We feel, however, that caution should be exercised in interpreting histological sections of acutely inflamed bowel, because identification of the layers of the wall may be difficult when long standing chronic inflammation with replacement fibrosis has occurred. Notwithstanding, our study supports the consensus – 29 (83%) had false diverticula and in only three of these cases were they multiple.

If right sided diverticulosis is acquired, the aetiology is likely to be similar to left sided disease, namely raised intraluminal pressure.^{14,15} However, we feel that the underlying cause of this high pressure in right sided diverticulitis is different. In left sided disease, high pressure changes are the result of a fibre deficient diet,¹⁶ whereas despite a high fibre intake in Hong Kong (estimated at about 14 g/day) the prevalence of right sided diverticulosis is high (C Metreweli, personal communication). These findings are in accord with a study from China where about 62% of diverticulosis occurred on the right despite a good fibre intake.¹⁷ It is interesting that in right sided diverticulitis a high pressure effect seems to result predominantly in solitary diverticula and not in multiple defects as seen in left sided disease, which raises the possibility of a congenital weakness in right sided diverticulitis.

Age distribution of patients with right sided diverticulitis (RSD) compared with appendicitis during the same period.

Furthermore, it is difficult to explain why there should be an absence of muscular thickening in right sided diverticulitis when it is a hallmark of left sided disease.

The outcome of patients in this retrospective series is satisfactory and it is gratifying that despite diagnostic inaccuracies, little morbidity occurred. Traditional surgical teaching has advocated that suspected appendicitis in those above the 30–40 years age group should be explored by a formal laparotomy. Over half our patients explored through a right iliac fossa incision had to have this closed and vertical laparotomy incision made to facilitate resection, and a further third needed to have the initial incision extended both medially and laterally. This finding supports the teaching dictum and thus we would support the advice in a high prevalence region such as Hong Kong.

We have shown that resection gives good results in all age groups. As populations from this part of the world settle in the west, we feel it behoves surgeons to be aware of this condition.

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