DIVERTICULAR DISEASE **MEDICAL APPENDIX**

(DIVERTICULOSIS)

DEFINITION

1. Diverticulosis is a disorder characterised by the presence of outpouchings of mucosa and submucosa through the muscular wall of the intestine. These diverticula (or more strictly, pseudodiverticula) may occur anywhere along the course of the gastrointestinal tract but are commonest by far in the distal and sigmoid colon.

2. 'Diverticular disease' encompasses all aspects and effects of the condition but conventionally applies to diverticulosis of the large intestine and its complications.

CLINICAL MANIFESTATIONS OF DIVERTICULOSIS

Small intestinal diverticula

3. With the exception of Meckel's diverticulum the most common locations in the small intestine are the duodenum and jejunum. Usually they are asymptomatic and are discovered incidentally during investigation for other disorders, but occasionally they may cause symptoms either because of their proximity to other structures or due to bleeding or inflammation.

Meckel's diverticulum

4. This congenital anomaly consists of a persistent omphalomesenteric duct. It occurs typically as a 5cm wide-mouthed diverticulum arising from the antimesenteric border of the ileum, usually within 100cm of the ileocaecal valve. The sac may be lined with ileal, gastric, duodenal, pancreatic or colonic mucosa. It is rarely symptomatic after the age of five years, but may give rise to haemorrhage, inflammation or obstruction in children and adolescents. In older children and young adults inflammation of the diverticulum may mimic appendicitis. Other complications, such as intussusception, enterolith formation and tumour may occur.

Colonic diverticula

5. The prevalence of colonic diverticula increases with age. They are rare under the age of 30 years, but almost universal in people over 80. The sigmoid colon is by far the commonest site in westernised countries but certain populations often have predominantly right-sided disease. This is the case in Japan, where the prevalence of diverticulosis has more than doubled in the '70s and '80s. The condition is rare in Africa and Asia.

6. Most cases are entirely asymptomatic, and are discovered as an incidental finding during barium enema or endoscopy for colon cancer screening. However, left lower abdominal discomfort and tenderness may be present, probably as a result of disordered motility. Constipation or diarrhoea may occur.

Complications of colonic diverticulosis

7. **Haemorrhage** Inspissated faecal material may accumulate within the structure, leading to abrasion of the nearby blood vessels and ensuing serious intraluminal haemorrhage. Blood loss may also occur from granulation tissue within the diverticulum. Typically, the bleeding is painless and it is of prime importance to exclude colonic malignancy.

8. **Diverticulitis** Simple or uncomplicated diverticulitis includes infection localised within the diverticular sac, which may progress to microperforation and the formation of small, contained pericolic abscesses. The frequency of this complication increases with age and it is rare in younger subjects; only 2% to 4% of patients with diverticulitis are under 40 years of age.

CLINICAL MANIFESTATIONS OF DIVERTICULITIS

9. Diverticulitis is characterised by left lower quadrant pain, leucocytosis and pyrexia. Colonoscopy is the most reliable means of confirming the diagnosis.

10. The condition tends to be more severe when it occurs in those under the age of 40, and more difficult to diagnose. Because the sigmoid colon may loop to the right in this younger age group a misdiagnosis of appendicitis may be made. Obesity is an important comorbid factor in a high percentage of young patients with acute diverticulitis.

11. Occasionally diverticulitis progresses to complicated diverticulitis.

CLINICAL MANIFESTATIONS OF COMPLICATED DIVERTICULITIS

12. This term encompasses any of the complications of diverticulitis, namely abscess formation, free perforation, faecal peritonitis, fistula formation and obstruction. Younger subjects present with a higher incidence of complicated diverticulitis, requiring surgery in 50% to 70% of admissions compared with only 15% to 30% of older patients.

    12.1. **Abscess formation** may occur if there is perforation of the serosa. Management depends upon its site and size. It may be amenable to CT-guided percutaneous drainage.

    12.2. **Free perforation** may occur either from a paradiverticular abscess or from the wall of the diverticulum itself. Generalised purulent peritonitis ensues and septicaemia will often follow.

    12.3. **Faecal peritonitis** is a catastrophic complication. It follows rupture of a diverticulum, often with little or no premonitory inflammation. The mortality rate is in the region of 50%

    12.4. **Fistula formation** is not uncommon in older age groups. Fistulae may occur between the sigmoid colon and bladder, vagina, ileum, uterus and other structures.

12.5. **Obstruction** Patients presenting with large bowel obstruction presumed to be due to diverticular stricture should undergo expeditious surgery following a short course of resuscitation.

AETIOLOGY

13. Some authorities hold the view that the low-fibre westernised diet plays a major role in the pathogenesis of diverticular disease. The role of dietary fibre is still debated. Painter and Burkitt found that in the UK, people eating a refined low-fibre diet had a colonic transit time of 80 hours, and mean stool weights of 110g per day. Contrasting figures in rural Ugandans eating very high fibre diets showed significantly shorter transit times of around 34 hours and stool weights of about 450g per day; diverticulosis is very rare in this population.

14. The increase in prevalence in Japan in the last few decades seems to mimic that seen in western countries and appears to reflect the decreasing fibre content (ie. westernisation) of the diet of that country. Environmental factors therefore may be of major significance. However the greater propensity for right-sided diverticulosis in Japan suggests an additional genetic contribution.

15. On the other hand it is proposed that altered colonic motility and changes in the colonic wall play the greater part in the aetiology of the condition. With age the colonic wall becomes more rigid and less distensible, and segmental spasm of the muscular coat of the bowel results in increased intraluminal pressure with mucosal extrusion near the structurally weak point of entry of the intramural blood vessels.

16. It is significant that diabetic patients are prone to diverticular disease at an earlier age, suggesting an abnormality in glycolisation of colonic collagen with advancing years. In individuals with connective tissue disorders such as Marfan's disease and Ehlers-Danlos syndrome, diverticula are also seen at an unusually early age.

17. No clear association with (so-called) irritable bowel syndrome has been satisfactorily established.

18. Diverticulosis is unrelated to previous healed bowel infection and is, indeed, rare in those countries where bowel infections are most prevalent. However, diverticula are subject to the same inflammatory processes as the rest of the colon and, if diverticulitis arises in the course of or in close time-relationship to some other form of colitis or dysentery, a relationship could not be denied.

19. The pathogenesis of diverticular disease is almost certainly multifactorial, as the population and pathology studies suggest. The anatomical structure of the colon, alterations in the colonic wall with ageing, motor dysfunction, abnormal increases in intraluminal pressure and lack of dietary fibre may all contribute to the development of diverticulosis in ill-defined and complex interrelationships.

CONCLUSION

20. Diverticular disease of the colon is a common condition, consisting of pseudodiverticula of the mucosa and submucosa extruding through the muscular layer of the bowel. The descending and sigmoid colon are by far the commonest sites. It usually causes no symptoms and requires no treatment. Complications include bleeding and infection (diverticulitis) which may proceed to complicated diverticulitis with abscess formation, perforation, faecal peritonitis and fistula formation. The cause is probably multifactorial with genetic influences playing a significant role, but the highly refined, low roughage western diet is almost certainly the major aetiological factor.

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