

- 2 Clark WC, Dohan FC Jr, Moss T, Schweitzer JB. Immunocytochemical evidence of lymphocytic derivation of neoplastic cells in malignant angioendotheliomatosis. *J Neurosurg* 1991;74:757-62.
- 3 Warnke RA, Weiss LM, Chan JKC, Cleary ML, Dorfman RF. Fascicle 14. Tumors of the lymph nodes and spleen. In: *Atlas of tumor pathology*. 3rd series. Washington DC: Armed Forces Institute of Pathology, 1995.
- 4 Angel CA, Pringle JH, Naylor J, West KP, Lauder I. Analysis of antigen receptor genes in Hodgkin's disease. *J Clin Pathol* 1993;46:337-40.
- 5 Angel CA, Pringle JH, Primrose L, Lauder I. Detection of immunoglobulin heavy chain gene rearrangements in Hodgkin's disease using PCR. *J Clin Pathol* 1993;46:940-2.
- 6 Pfeiffer I, Tappeiner J. Zur Kenntnis des systemisierten. Endotheliomatose der curanen Blutgefasse. *Hautarzt* 1959;10:359-633.
- 7 Weiss LM, Trella MJ, Cleary ML, Turner RR, Warnke RA, Sklar J. Frequent immunoglobulin and T-cell receptor gene rearrangements in "histiocytic" neoplasms. *Am J Pathol* 1985;121:369-73.
- 8 Cline MJ. Histiocytes and histiocytosis. *Blood* 1994;84:2840-53.
- 9 O'Grady JT, Shahidullah H, Doherty VR, Al-Nafussi A. Intravascular histiocytosis. *Histopathology* 1994;24:265-8.
- 10 Prayson RA. Angiotropic large cell lymphoma: simultaneous peripheral nerve and skeletal muscle involvement. *Pathology* 1996;28:25-7.
- 11 Kao NL, Broy S, Tillawi I. Malignant angioendotheliomatosis mimicking systemic necrotizing vasculitis. *J Rheumatol* 1992;19:1133-5.
- 12 Stahl RL, Chan W, Duncan A, Corley CC Jr. Malignant angioendotheliomatosis presenting as disseminated intravascular coagulation. *Cancer* 1991;68:2319-23.
- 13 Williams DB, Lyons MK, Yanagihara T, Colgan JP, Banks PM. Cerebral angiotropic large cell lymphoma (neoplastic angioendotheliomatosis): therapeutic considerations. *J Neurol Sci* 1991;103:16-21.
- 14 Ceci A, de Terlizzi M, Colella R, Balducci D, Toma MG, Zurlo MG. Etoposide in recurrent childhood Langerhans' cell histiocytosis: an Italian cooperative study. *Cancer* 1988;62:2528-31.

*J Clin Pathol* 1997;50:70-71

## Involvement of the appendix in pseudomembranous colitis

J D Coyne, P A Dervan, N Y Haboubi

### Abstract

**Pseudomembranous colitis (PMC) is an inflammatory disorder usually limited to the large intestine and is the consequence of antibiotic associated *Clostridium difficile* overgrowth with production of its toxin. It has a characteristic gross and microscopic appearance. PMC-like changes, usually associated with perioperative hypotension and with more extensive gastrointestinal tract involvement, have also been described. In neither clinical setting has pseudomembranous appendicitis been recorded. A case of pseudomembranous appendicitis in a 76 year old woman is described.**

(*J Clin Pathol* 1997;50:70-71)

Keywords: appendix; pseudomembranous colitis; pseudomembranous appendicitis.

Pseudomembranous colitis (PMC) is an inflammatory disorder usually limited to the large intestine and is the consequence of antibiotic associated *Clostridium difficile* overgrowth with production of its toxin.<sup>1</sup> It has a characteristic gross and microscopic appearance. PMC-like changes, usually associated with perioperative hypotension and with more extensive gastrointestinal tract involvement, have also been described.<sup>2</sup> In neither clinical setting has pseudomembranous appendicitis been recorded and we therefore wish to document its occurrence.

### Case report

A 76 year old woman on haemodialysis for chronic renal failure developed rigors. Blood

cultures grew staphylococcus and she was treated with clindamycin. The patient developed abdominal pain and diarrhoea, and a diagnosis of pseudomembranous colitis was confirmed on colonoscopy and biopsy appearances. She was treated conservatively, given metronidazole and settled. Four weeks later, the patient was readmitted with recurrent pseudomembranous colitis. Because she was unresponsive to further conservative treatment, a proctocolectomy was performed. The patient died of septic shock five days later.

### Pathology

The proctocolectomy specimen measured 70 cm in length with an attached appendix 6 cm in length. Multiple diverticula were present over almost the entire length of the transverse and descending colon. The mucosal surface showed diffuse disease with areas of ulceration alternating with adherent greenish membranes. Microscopic examination showed the typical appearances of pseudomembranous colitis with well-formed intracryptal summit lesions (type I) and type II lesions composed of dilated and disrupted crypts, showing partial destruction and surmounted by an explosive exudate of neutrophils and fibrin. There was extensive involvement of the diverticula and sections of the appendix showed typical lesions involving the mucosal surface (figs 1 and 2).

Examination of our records revealed five other colectomy specimens submitted to our laboratories with pseudomembranous colitis during the preceding 20 years. The patients' ages ranged from 47 to 77 years and three of these had a history of antibiotic usage with

Department of  
Histopathology, South  
Manchester University  
Hospitals NHS Trust,  
Manchester  
J D Coyne  
N Y Haboubi

Department of  
Pathology, The Mater  
Hospital, University  
College Dublin,  
Dublin, Ireland  
P A Dervan

Correspondence to:  
Dr J D Coyne, Department  
of Histopathology, South  
Manchester University  
Hospitals NHS Trust,  
Withington Hospital, Nell  
Lane, Manchester M20 8LR.

Accepted for publication  
30 September 1996

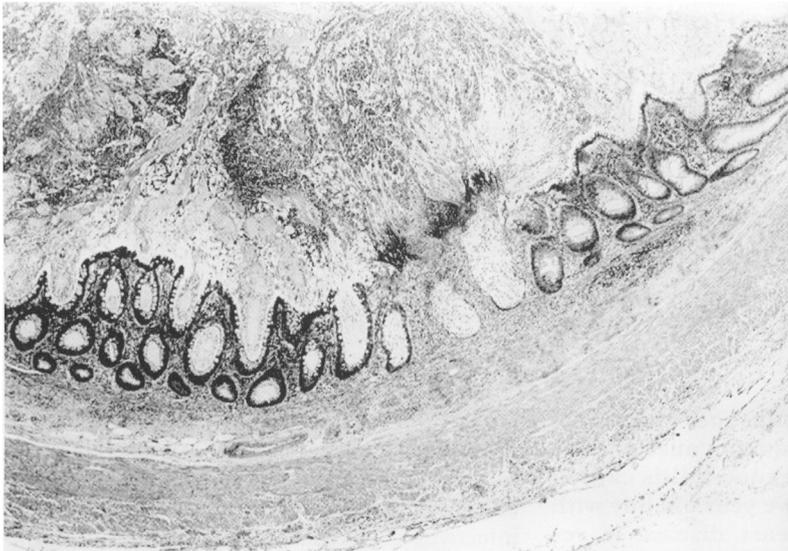


Figure 1 Typical appearances of pseudomembranous appendicitis illustrating focal crypt destruction and surface acute fibrinous exudate.



Figure 2 High power view of a typical mucosal lesion with mushroom-shaped surface exudate.

positive culture of *C difficile* and detection of its toxin. No documentation was found in the fourth case and in the fifth the original case notes were no longer available. Review of the histological slides revealed the typical appearances of pseudomembranous colitis and in the latter case typical appearances of pseudomembranous appendicitis involving the proximal mucosa.

## Discussion

Involvement of the appendix in pseudomembranous colitis has not to our knowledge been documented previously. This disease typically involves the colon, although a case involving an ileal conduit has also been published.<sup>3</sup> Similarly, PMC-like changes involving the gastrointestinal tract from the oesophagus to the colon have been described, usually occurring after abdominal surgery, but there is no mention of appendiceal involvement.<sup>2,4</sup> Why there is occasional appendiceal involvement despite similar degrees of severity and extent of disease is uncertain. Although the features of pseudomembranous colitis have been reported in other pathological states, including infective and ischaemic aetiologies,<sup>5,6</sup> we feel it is important to document the occurrence of pseudomembranous appendicitis. While Arber described the case of a 76 year old woman who had an exploratory laparotomy for a presumptive diagnosis of perforated appendicitis and who had pseudomembranous colitis localised to the caecum,<sup>7</sup> the clinical presentation in our two cases with appendiceal involvement was that of typical PMC rather than that of acute appendicitis. Although in up to 10% of patients with pseudomembranous colitis, the proximal colon only may be involved<sup>8</sup> and despite our findings which indicate that appendiceal involvement can occur, an isolated pseudomembranous appendicitis with clinical features of acute appendicitis has yet to be described.

The authors acknowledge the excellent secretarial assistance of Miss Michelle Garner and Alan Curry, PhD, for the photomicrographs.

- 1 Morson BC, Dawson IMP, Dey DW, Jass JR, Price AB, Williams GT (eds). Inflammatory disorders. In: *Morson and Dawson's Gastrointestinal pathology*. London: Blackwell Scientific Publications 1991:477-549.
- 2 Penner A, Bernheim AI. Acute post-operative enterocolitis: a study on the pathologic nature of shock. *Arch Pathol* 1939;27:966-83.
- 3 Shortland JR, Spencer RC, Williams JL. Pseudomembranous colitis associated with changes in an ileal conduit. *J Clin Pathol* 1983;36:1184-7.
- 4 Pettet JD, Baggenstoss AH, Deering WH, Judd ES. Post-operative pseudomembranous enterocolitis. *Surg Gynaecol Obstet* 1954;98:546-52.
- 5 Kelly J, Oryshak A, Wenetsek M, Grabiec J, Handy S. The colonic pathology of *Escherichia coli* 0157:H7 infection. *Am J Surg Pathol* 1990;14:87-92.
- 6 Price AB. Ischaemic colitis. In: Williams GT (ed). *Current topics in pathology. Gastrointestinal pathology*. Berlin: Springer Verlag, 1990:229-46.
- 7 Counihan TC, Roberts PL. Pseudomembranous colitis. *Surg Clin North Am* 1993;73:1074.
- 8 Arber H, Udassin R, Amir G, Zamir O, Hissan S. Localized pseudomembranous colitis simulating carcinoma of the caecum. *Am J Gastroenterol* 1987;82:1193-5.