

Pseudomembranous Colitis. Radiologic and Endoscopic Observations in Four Cases

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ABSTRACT — The authors present four cases of pseudomembranous colitis following antimicrobial therapy.

The endoscopic and radiologic findings are shown and, based on review of the literature, the etiology and clinical findings of the disease are discussed, together with the most efficient diagnostic and therapeutic procedures.

INDEX TERMS — Colitis, Pseudomembranous, Antibiotics, Side effects of, Colon.

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INTRODUCTION

Pseudomembranous colitis was recognized as an independent disease at the end of the last century (Finney, 1893), which could be distinguished from the other kinds of colitis due to its characteristic pathologic picture.

Its etiology, however, remained unknown until a few years ago, as well as the correlation with antimicrobial therapy. In particular, since 1970, many authors related its onset to the use of lincomycin and related drugs (3, 4, 5, 12).

Therefore the disease, formerly known as antibiotic colitis, was also called Lincomycin and/or Clindamycin colitis.

Only recently the etiology was shown, by isolation from the feces of affected patients of antibiotic-resistant bacteria of the Clostridium type (1, 6, 7, 10, 11, 12, 19),

using which the disease can be experimentally induced.

CASE REPORTS AND METHODS

Case 1 - A 57 y.o. white woman was admitted because of sclerotic arteriopathy with iliac and femoral obstructive lesions, and left renal artery stenosis causing hypertension.

The patient underwent aorto-bifemoral bypass with dacron grafts. The following antimicrobial therapy was instituted.

Streptomycin 500 mg b.i.d. I.M. for four days; Totacef 2 g b.i.d. I.V. for 8 days, and then Ceporex 1 g q.i.d. P.O. and Lincomycin 600 mg b.i.d. P.O. for six days.

The patient experienced diarrhea four days postoperatively, with liquid feces and mucus.

The general condition was rapidly compromised, with severe asthenia and anorexia, a temperature of 38°C, leukocytosis (w. b.c. = 26,000), fluid and electrolyte imbalance and hypoproteinemia

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Fig. 1 - Case 1: Pronounced segmentation of the right colon with "grooved" pattern and presence of "thumb printing" due to edema of the submucosa.

(5.4 g%) with an inversion of alpha to gamma globulin ratio; serial stool cultures were negative. A double contrast barium enema was performed, which showed: diffuse alteration of the mucosal pattern, with "grooved" pattern due to numerous pseudopolypoid formations, with segmentation of the viscus due to parietal spasm and thickening (Fig. 1).

Colonoscopy was then performed, showing: diffusely hyperemic, edematous mucosa, covered by white-yellowish, elevated plaques, particularly numerous in the sigmoid, descending and transverse colon (Fig. 2).

The diagnosis of pseudomembranous colitis was made, and the patient put under total parenteral alimentation, with electrolytic and protein corrections.

The antibiotic therapy was discontinued and replaced by steroid enemas.

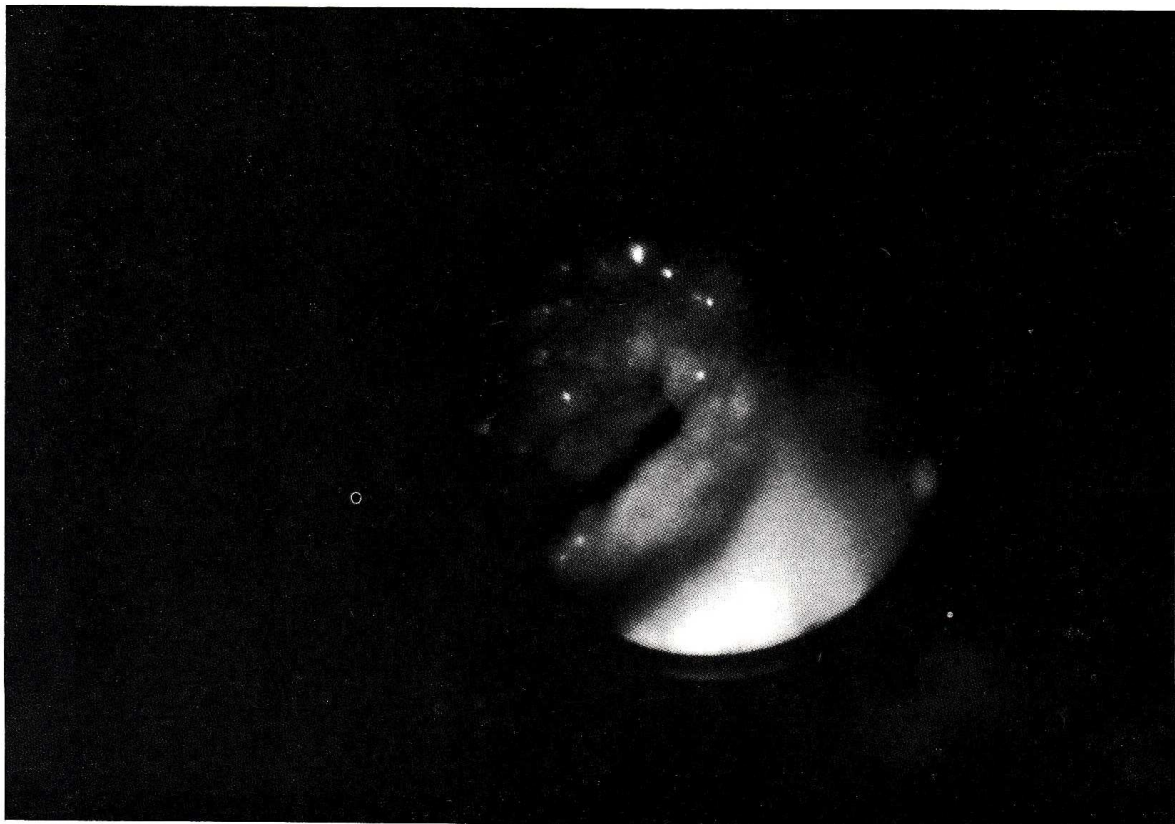


Fig. 2 - Case 1: Pseudomembranes assuming a pseudopolypoid aspect.

After twenty days, following progressive improvement of the general condition, and regression of diarrhea, the parenteral alimentation regimen was discontinued until discharge.

Case 2 - A 72 y.o. woman was admitted due to gallbladder empyema. After surgery, she underwent antimicrobial therapy with Rifocin 500 mg b.i.d. I.V. and then Lincomycin 600 mg t.i.d. I.M. On the sixth day postoperatively, diarrhea appeared, with liquid feces full of mucus, a temperature of 39° C. Leukocytosis (14,000), hypodysproteinemia, and water and electrolytes imbalance.

General condition worsened, with a diffusely tender and meteoric abdomen.

A stool culture gave negative results. A barium enema showed a similar picture to case one: a "grooved" aspect of the colic mucosa (Fig. 3).

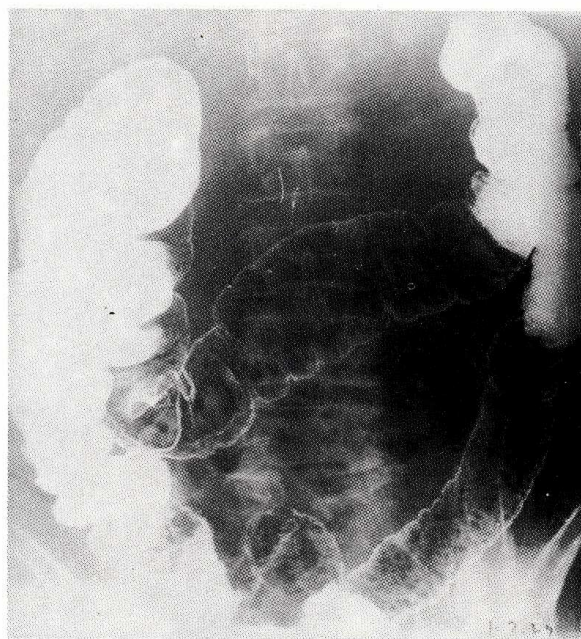


Fig. 3 - Case 2: Diffuse pseudopolypoid images, slightly elevated, giving to the mucosal surface a "cobblestone" appearance.



Fig. 4 - Case 2: Colonoscopy shows clearly edema of the mucosa, diffusely covered with elevated yellowish plaques.

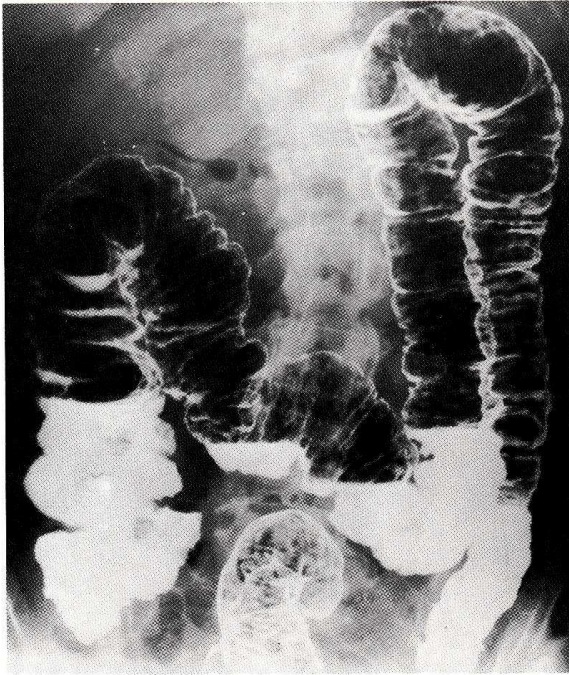


Fig. 5 - Case 3: Pseudopolyps spreading all over the colon.

The colonoscopy showed a similar report: diffuse edema, with plaques adherent to the mucosa (Fig. 4).

Antimicrobial therapy was discontinued, and the patient was treated with steroid and Kanamycin enemas, until a complete regression of the symptomatology was achieved.

Case 3 - A 60 y. o. woman was admitted for acute ischemia of the right lower limb. After emergency femoral embolectomy, with good immediate results, two days postoperatively ischemic signs ensued again, which required lumbar sympathectomy and amputation.

After the amputation, the patient developed septic fever, with stump suture dehiscence. Antimicrobial therapy was started, with Lincomycin 600 mg. b.i.d. I.V. and then Ampicillin 500 mg. q.i.d. and Cephalexine 500 mg. q.i.d.

After four days, diarrhea appeared, with

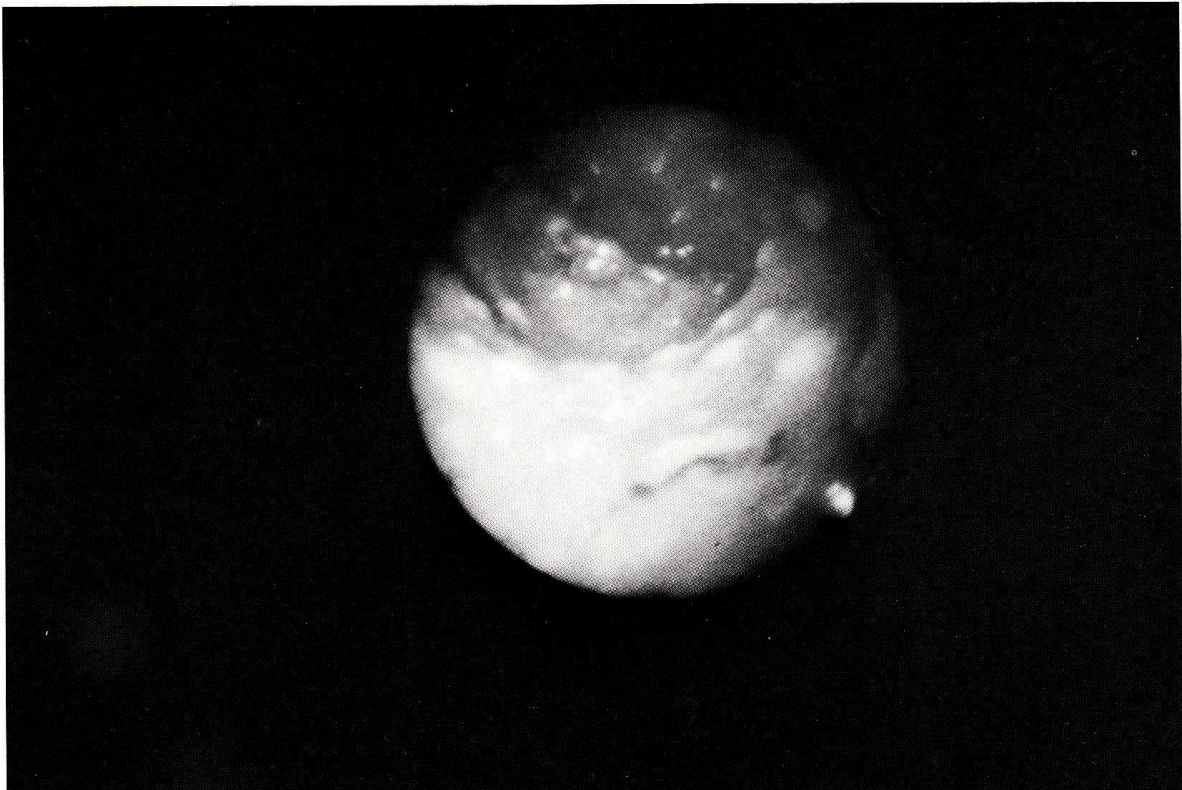


Fig. 6 - Case 3: Diffuse white pseudomembranes sticking to the colon wall. Biopsy easily causes bleeding.

liquid stools, protein imbalances, and a rapid deterioration of the general condition.

The barium enema showed the "grooved" pattern of the colic mucosa, (Fig. 5), confirmed by colonoscopic examination, which showed numerous elevated white plaques, and marked mucosal edema (Fig. 6). The diagnosis of pseudomembranous colitis was made, antibiotics were discontinued, and steroid enemas were started until recovery.

Case 4 — A 56 year old woman underwent antimicrobial therapy for dental abscesses using Rifampicin 300 mg. t.i.d. p.o.

After five days of treatment, diarrhea with numerous daily bouts of watery feces occurred, together with diffuse abdominal pain and fever.

A double contrast barium enema showed diffuse alteration of the mucosal folds with a pseudopolypoid aspect (Fig. 7).

A colonoscopic examination confirmed the colic alterations: the mucosa appeared edematous and hyperemic, densely covered with whiteish, yellow plaques (Fig. 8).

Antimicrobial therapy was discontinued, and the symptoms disappeared in ten days.

DISCUSSION

According to clinical and experimental data (1, 6, 7, 10, 11, 12), pseudomembranous colitis is caused by the cytotoxic action on the colic mucosa of toxins produced by microorganisms of the *Clostridium* type (*Clostridium difficile*, *Clostridium Sordelli*). These germs thrive in the colon until they reach a high concentration, following the action on the intestinal flora of certain antibiotics. They are not usually found in the feces of healthy subjects, but have been frequently isolated from stool cultures done on patients suffering from pseudomembranous colitis.

Their toxins, isolated from these cultures, possess cytotoxic action in vitro, and, after inoculation in guinea pigs' colons, produce a

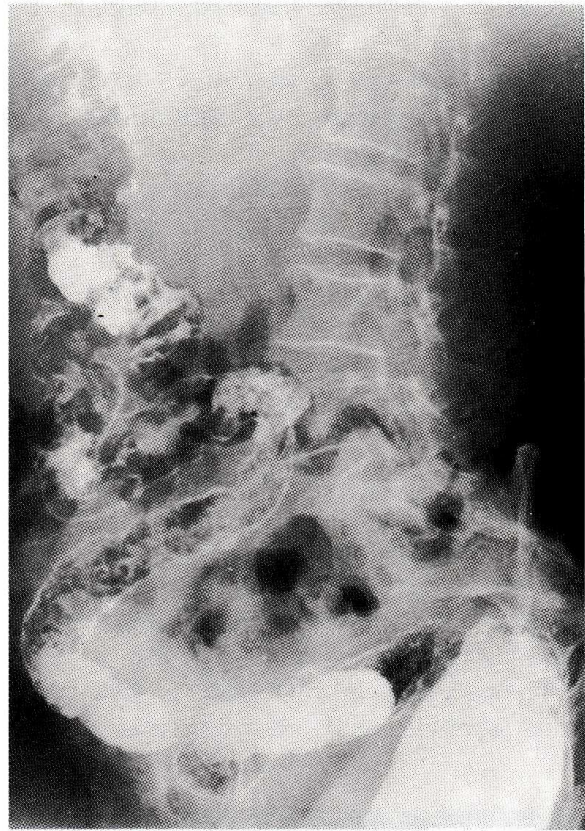


Fig. 7 - Case 4: At the level of the rectum and sigmoid colon, clear pseudopolypoid images. Segmentation and "thumb printing" of the transverse colon.

clinical and pathologic picture similar to the human disease.

This pathogenic mechanism is valid for those cases which occur following antibiotic therapy: the disease may however take place in other situations, such as postoperatively and during chronic debilitating conditions, especially in elderly people (5, 9, 10, 12, 13, 15, 16).

The clinical picture of pseudomembranous colitis is dominated by diarrhea, which may appear from 4 to 10 days after the beginning of antimicrobial therapy, and can be so profuse that death may occur due to water and electrolyte imbalance.

Other variable and inconstant symptoms, such as relapsing fever, abdominal pain and distention, may lead the diagnosis towards forms of acute abdomen (abscess, anastomosis dehiscence and so on), in

patients who have undergone abdominal surgery.

The laboratory examinations may show leukocytosis, electrolytic alterations, and hypo-dysproteinemia.

No blood is usually found in the stool, and other germs are not found in the stool cultures (9, 20).

The fundamental exams for the diagnosis are colonoscopy with histologic exams of the biopsy fragments, and the radiologic examination with a double contrast barium enema (1, 20).

The endoscopic examination reveals a typical pattern: the colic mucosa appears hyperemic, edematous, ready to bleed, and densely covered with yellow and white plaques whose diameter varies from one to six millimeters.

The pseudomembranes tend to fuse in the most affected areas, but the alteration is

usually diffuse in the whole colon (4, 9, 14, 15, 16).

The histologic picture is pathognomonic: the pseudomembranes are composed of an exudate containing fibrin, mucus, leukocytes, and necrotic cells, adherent to the mucosa in areas of fibrinoid superficial necrosis. The underlying glandular tubules appear dilated and full of mucus. The submucosa is edematous with rich lymphocytic infiltration (15, 16).

The plain radiologic exam of the abdomen is rarely meaningful: varying degrees of gaseous colic distention may be found, which cannot be distinguished from those observed during ischemic colitis and toxic megacolon (13, 17).

The barium enema can show specific findings, particularly if it is performed with the double contrast technique.

On the radiogram the mucosa of the colon

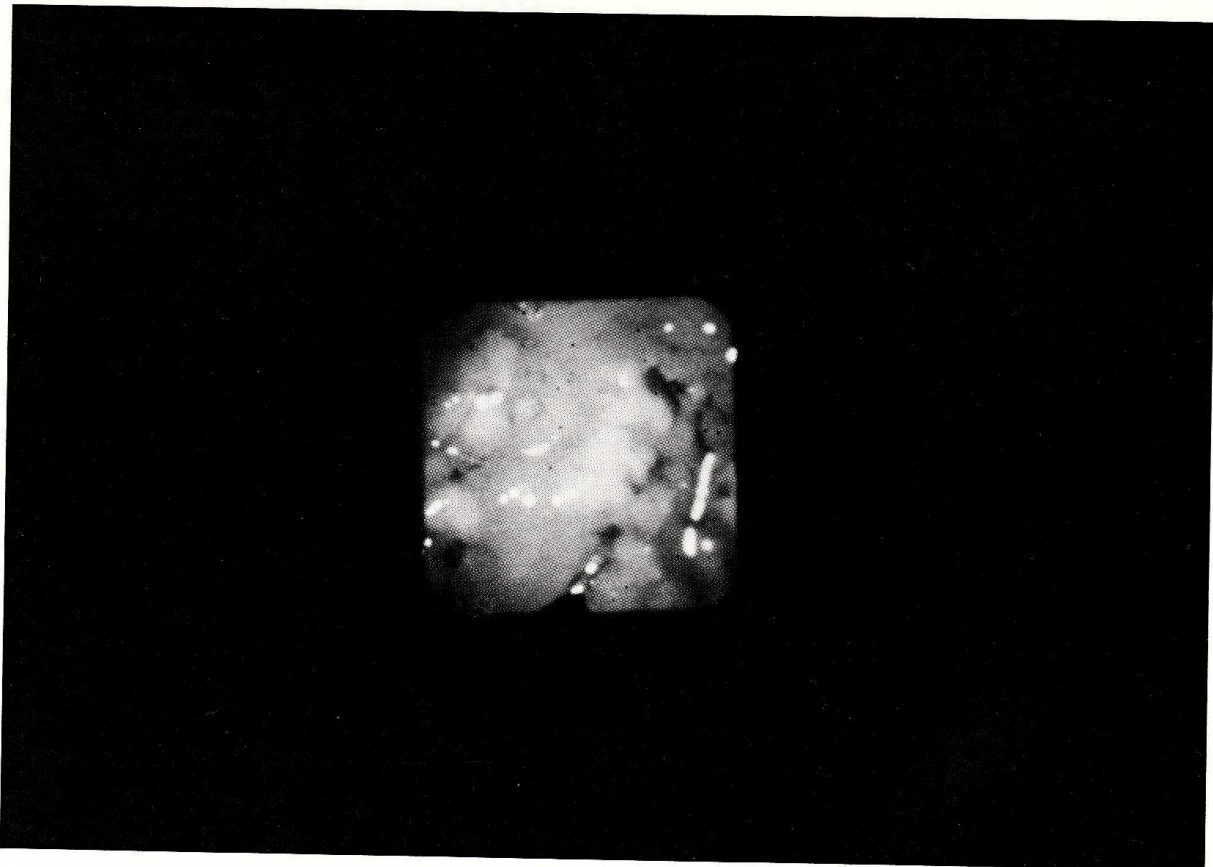


Fig. 8 - Case 4: At colonoscopy close view of the pathologic pattern.

appears diffusely covered by small pseudopolypoid images, slightly elevated, which are the radiologic expression of the pseudomembranes.

The overall "grooved" aspect is easily distinguishable from chronic ulcerative colitis due to the smaller dimensions of the pseudopolypoid formations.

Other non-specific findings of the disease can be found, such as disappearance of the haustra, thickening of the transverse plicae and thumbprinting due to edema of the submucosa (15, 16).

The therapy of pseudomembranous colitis should be started as early as possible; it is based upon the suspension of current antimicrobial therapy, the topical administration of corticosteroids, and adequate parenteral protein and electrolytic support.

Some authors have recently described some new therapeutic means including Vancomycin per os (2, 6, 8, 11, 18) and Methronidazole (21).

CONCLUSIONS

In the reported cases other factors than antibiotics, including surgical stress and age, may have had a role in the pathogenesis of pseudo-membranous colitis.

The disease allows an early diagnosis due to its peculiar radiologic and endoscopic pictures.

Therapy, started in the initial phase of the disease, brought to the complete remission of the clinical picture.

Pseudomembranous colitis is a more frequent disease than reported in the literature; it may often be confused with a trivial side effect of antibiotic therapy, while it should be regarded, particularly in high risk subjects, as a severe complication, given the often fulminating course, which imposes a prompt diagnosis and therapy.

All the barium enema have been performed with MIXOBAR 70% D.C. by Byk GULDEN ITALIA - SpA.

RIASSUNTO

Vengono presentati e discussi 4 casi di colite pseudo-membranosa, insorti dopo terapia con antibiotici: in particolare, vengono mostrati i quadri endoscopici e radiologici. Sono discusse le più consigliabili procedure diagnostiche, la terapia, nonché la possibile eziologia.

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