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EXCAVATED MASS AND DOUBLE TRACKING IN THE SIGMOID COLON DUE TO COLOCOLIC FISTULA COMPLICATING DIVERTICULITIS

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We report on a patient admitted for work up of prostatic carcinoma in which CT study showed an excavated mass involving the sigmoid colon and the bladder dome. Barium enema showed a double track pattern associated with diverticular disease. By surgery the mass was separated from the urinary bladder and the sigmoid resected. On pathological exam diverticulitis was evident as well as an organised colocolic fistula in the thickened fibrotic subserosal fat. The usefulness of opacifying the colon is highlighted.

Key-word: Fistula, colonic.

Intramural abscesses/fistula complicating diverticulitis are uncommon (1, 2) and predominantly described in the sigmoid colon (3). On conventional radiology their appearance is described as having a double tract pattern (4).

In a case of fistulous intramural abscess of the sigmoid colon, we report the CT and conventional radiographic features in correlation with histopathologic findings.

Case report

A 72-year-old man with a history of prostatic adenocarcinoma classified as Gleason 8 presented a pelvic mass, different from prostate, on physical examination which justified further investigation. He complained of vague abdominal pain and a weight loss of 10 kg for the last 6 months. Several antibiotic therapies for various indications especially urinary symptoms were reported. No fever, no intestinal bleeding was reported.

No significant change of the biological inflammatory parameters was found.

Computer tomography (CT) of the abdomen showed narrowing of the sigmoid colon and an elongated paracolic soft-tissue mass (6.5 x 3 cm) containing gas and necrotic material as well as dense opacities. No adenopathy were found in the surrounding areas. A colonic excavated mass was suggested, the differential diagnosis including a perforated either primary or metastatic colonic neoplasm, but an invading vesical carcinoma was not excluded (Fig. 1).

Fig. 1. — CT-scan of lower abdomen after I.V. contrast material: coronal (A) and sagittal (B) reconstructions, shows sigmoid narrowing (dots), diverticula and along the inferior borders of the sigmoid an elongated mass largely excavated bonding with the vesical dome (between arrowheads).

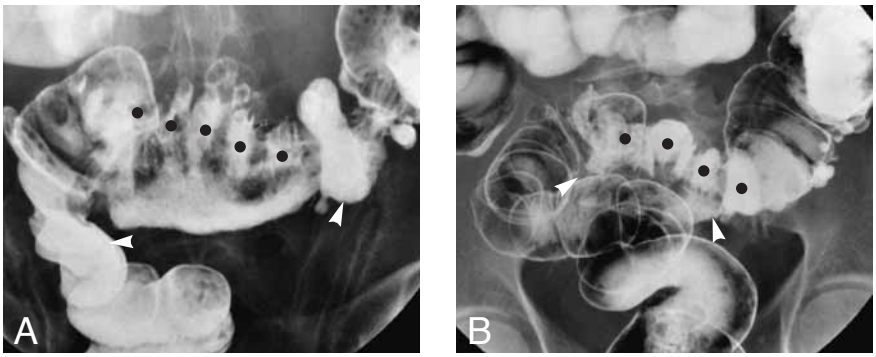

Fig. 2. — DCBE images in dorsal (A) and ventral decubitus (B) confirm the narrowing of the sigmoid (dots) and demonstrate multiple diverticula, tethering of the inferior sigmoid border, normal mucosal appearance and a double track pattern (between arrows). The second track parallel to the true lumen is filled with barium or air in dependence with the positioning of the patient and has an indented superior and a regular inferior borders.

Double contrast barium enema (DCBE), undertaken five days after, confirmed the narrowing of mid-sigmoid and the occurrence of multiple diverticula. It also demonstrated in this narrowed part crossing ridges, tethering of the inferior border and a normal mucosal appearance. A double track pattern was evenly showed, the second track being located along the inferior surface of the involved sigmoid with a indented superior and a regular inferior border. This 6 cm long sinus tract communicated with the true sigmoid lumen (Fig. 2). The

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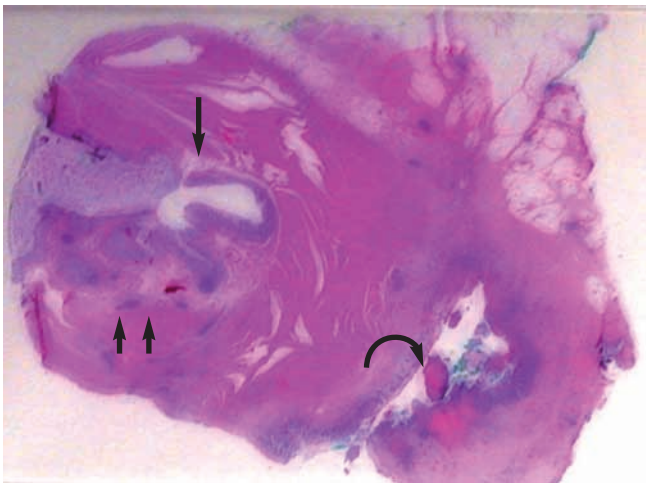

Fig. 3. — On histologic section of the surgical specimen, the true sigmoid lumen (arrow), the hypertrophic muscular layers (double arrow) and the large subserosal fistulous track surrounded by 2 cm thick inflammatory fibrofatty tissue are visible as well as an inflammed and perforated diverticulum (curved arrow).

diagnosis of intramural abscess/fistula complicating diverticulitis was suggested.

Colonoscopy was unremarkable.

The surgeon found a sigmoid mass firmly adherent to the urinary bladder which was successfully dissected from bladder. A 16 cm long resection of the sigmoid followed by an end-to-end anastomosis was then performed.

The histopathological study of this resected specimen showed inflammated diverticula penetrating through the hypertrophic muscular layers into the subserosa (Fig. 3). Gross inflammatory thickening of the subserosa layer surrounding a ruptured diverticulum and a large fistulous track was also demonstrated. No evidence of colonic neoplasm was found.

Diverticulitis of the sigmoid complicated by an intramural colocolic fistula and inflammatory involvement of peritoneum and bladder wall was the final diagnosis.

Discussion

Abscesses are a common complication and also a valuable sign of diverticulitis, with a frequency ranging in the literature from 7% to 59% (1). Contrary to the most frequent pericolic one, the intramural variety of abscess is rare. Its prevalence has been estimated close to 9% of patients with complicated diverticulitis (5).

Clinical suspicion of diverticular abscess rises when a patient fails to improve with antibiotic. He may present with abdominal pain, usually in the left lower quadrant, tenderness and possibly a palpable mass. Fever and leukocytosis are also common in the acute stage.

Conventional radiography, in particular DCBE, demonstrates accurately diverticula as barium-coated outpouchings from the colonic mucosa associated or not in case of diverticulosis, with lack of expansion in the involved segment of the colon. Further, it can depict abscesses that communicate with the colon lumen, showing extravasation of barium in pericolic neo-cavities. Pathologic text books report that these neo-cavities well-delineated are usually due to a granulated-tissue that sheathes the inflammatory process (3).

However the diagnosis performance of DCBE is inherently limited in case of suspected diverticulitis because the inflammatory process is extramucosal and/or pericolic (5, 6).

In 1946, Cohen and Matthews described for the first time the characteristic double track pattern in the sigmoid colon in relation with a concept of dissecting peridiverticulitis (4). Cohen (6) postulated that a diverticulum could turn and herniate between the muscular layers instead of through the outer one.Then, when infection occurs and causes the

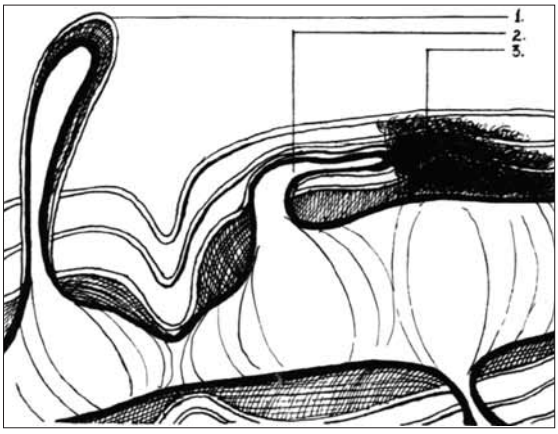

Fig. 4. — Schematic drawing of colon showing sread of infection into bowel wall. 1. Vertical diverticulum. 2. Intramural diverticulum 3. Infection spreading in bowel layers.

From R.M. Reynolds, F. Wietersen, R.P. Reynolds. "Intramural diverticulitis". Annals of Surgery; February 1960: 251-254.

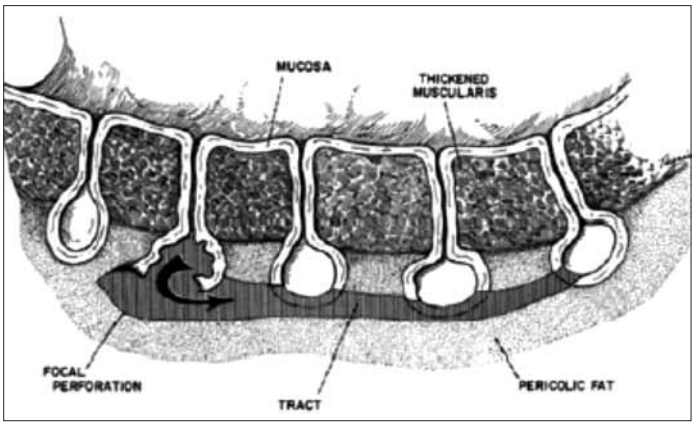

Fig. 5. — Presumed mechanism for multiple sites of tract-lumen communication in dissecting peridiverticulitis. A diverticular abscess dissects longitudinally within pericolic fat serially involving adjacent diverticula producing several points of fistulous communication with bowel lumen.

diverticulum to rupture, process would extend in lengthwise direction in and along the bowel wall (Fig. 4).

Another theory from JT Ferrucci et al. (4) stated on the basis of radiopathological correlations that dissecting sinus tracts can originate from focal mucosal perforation of the intramural portion of a diverticulum and extend intramurally through colonic layers along the bowel axis occasionally with multiple communications to the bowel lumen via additional perforated diverticula, with or without rupture into the peritoneal cavity or adjacent organs. The location of such tracks can be submucosal, within the muscularis or even subserosal (Fig. 5).

Previous studies reported that sinus tract were chiefly submucosal or subserosal (2). Contrary to submucosal type, the subserosal one frequently leads to colocolic, enterocolic or colonic-vesical fistulae and perforations (2). In our case, the subserosal location and the intramural characters of the abscess was clearly demonstrated.

In our patient also the input-output flowing of the contrast in the sinus tract when the patient was changing position agrees with this theory of colocolic fistulous abscesses.

Double track pattern can be demonstrated not only in patients with peridiverticulitis but either in those with colonic carcinoma, or those with granulomatosis – especially Crohn's disease (CD).

In case of diverticulitis, double tracking is mostly seen in sigmoid colon. To our knowledge only two cases of double tracking has been reported in transverse colon (2, 4). The second track length can vary from few millimeters to several centimeters (2), in average 3-6 cm (4, 7). However, several examples of diverticular sinus tract longer than 10 cm have been reported with diverticulitis. Usually straight or linear in configuration, the track courses parallel to the colonic lumen with consistent caliber throughout their length. It can be located either on the mesocolic or the antimesocolic border and sometimes both borders are involved.

In patients with neoplasm, the sinus tract use to be wider and more irregular in caliber than in patients with diverticulitis with a length ranging from 1,5 to 5,5 cm, based on Ferrucci's study (4). Although, differentiation of fistulous colon cancer with diverticulitis may be difficult especially in the double track cases which can look like a flat neoplasm due to local submucosal or mucosal inflammation. In consequence, colonoscopy is mandatory for the differential diagnosis.

On conventional radiography, diverticulitis and CD can be indistinguishable. However, the demonstration of ulceration, edematous and distorted folds, and other sites of colon involvement should suggest the diagnosis of CD (2, 4, 8). On the other hand, an initial assertion that a long intramural abscess giving the double track sign is very likely to represent CD has not been substantiated (4). But there are sufficient cases to confirm the occurrence of CD in a sigmoid affected with diverticular disease (2).

CT remains currently the most sensitive and specific test to document diverticulitis and its complications (1, 3, 6). Findings include localized wall thickening, peripheral diverticula, pericolic fat stranding and possibly fistula or bowel obstruction. Abscesses appear as abnormal fluid collections within an area of inflammatory changes in the mesentery and their centre may contain air or air-fluid levels (5, 6, 9). This can resemble necrotic colonic carcinoma. JM Pereira et al. (10) report that in patients with diverticulitis the fat stranding characteristically is disproportionately more severe than the mild and focal colonic wall thickening. Also accumulation of fluid in the root of sigmoid mesentery and engorgement of mesenteric vessels can be seen, due to the inflammatory process. In opposite, colonic carcinoma use to show a severe, irregular and eccentric wall thickening rarely exceeding 5 cm in length with an abrupt transition from normal to abnormal wall thickness. Later, V Goh et al. (9) noticed that between morphologic and perfusion criteria, the last ones are strongest discriminatory for distinguishing diverticulitis from colon cancer.

To the best of our knowledge, there is no report of a study focused on the double track sign. And its description remains not precise in studies reporting on diverticular abscesses. MF Kircher et al. (1) described sinus tract as a linear streak of contrast material found in the bowel and reported a good negative predictive value of this sign. There is also evidence of higher accuracy of CT using endoluminal contrast material via the rectum (1, 11). Evenly, in our case, this technique was not performed. Use of endoluminal contrast material would probably have allowed to recognize the double track sign on the CT images.

In a different clinical setting, colon opacification with a hydrosoluble contrast agent associated or not with a focused complementary CT would be an alternative to DCBE as second line investigation. Despite its well recognized value for the differentiation between mucosal and extramucosal lesion DCBE due to the use of high density barium hampering further radiological investigation is controversial in emergency situations.

On the other hand in patients with urothelial tumors, extravesical spread is very common and associates a thickened bladder wall rapidly enhancing with an infiltrated perivesical fat (12). When a fistula does exist, the diagnostic accuracy of cystogram and barium enema is not high (13). A CT-scan is useful for understanding bladder-intestinal tract location. Furthermore, CT urography is of utmost importance allowing assessment of local and distal extension and above all analysis of mucosal changes and henceforth permits to avoid invasive cystoscopy in patient with normal findings. In our patient, the CT protocol lacks late phase according to purpose of the examination. However, it would help to exclude hypothesis of urothelial tumor but tumor from detrusor demands surgical resection and histopathological study.

Antibiotic therapy is recommended to treat patient with small diverticular abscesses (< 3 cm). The treatment of choice for collections larger or equal to 4 cm is bowel resection and anastomosis. Since 1980's, CT-guided percutaneous drainage, depending on the abscess location, is performed as a temporizing measure. This must be followed by referral for surgical treatment, if needed. The development of this technique allows avoiding multistage surgical procedures (14).

However, due to the localization, intramural abscesses may be more susceptible to lead to colon perforation when percutaneous drained. This theoretical risk has not been documented in the literature.

Conclusion

The antibiotics treatment undergone by our patient and the prostatic disease have probably masked the occurring diverticulitis and lead to the evolution of the intramural abscess in a chronic colocolic fistula

with peritoneal extension of the inflammatory process and the formation of an inflammatory mass adherent to the urinary bladder.

DCBE has been very efficient in demonstrating the double track pattern associated with the diverticular disease and in orienting the diagnosis toward complicated diverticulitis. It has been complementary to the CT and endoscopic studies.

CT was more performant in demonstrating the relation of the inflammatory mass with the enhancing sigmoid colon as well as its extension to the urinary bladder.

The relatively thin slightly enhanced wall of the excavated mass should be mentioned as an argument for its inflammatory nature.

The use of intraluminal contrast may have improved the diagnostic impact of CT by showing the fistulous character of the sigmoid mass.

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