

Original article

Intraabdominal abscesses in patients with Crohn's disease: Clinical data and therapeutic manipulations in 17 cases of a single hospital setting

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SUMMARY

Aim: To describe the clinicoepidemiological data and therapeutic manipulation in 17 patients with Crohn's disease who developed intraabdominal abscesses during a period of twelve years. **Patients and Methods:** There were 9 men and 8 women aged 31+/-10 years. The underlying intestinal disease was located in the small bowel in all cases except for four in which the small and large bowel was concurrently affected. The duration of disease was 6.7+/-4.0 and 4.6+/-2.4 years at the time of data analysis and the appearance of complication, respectively. **Results:** Abdominal pain, fever, and palpable abdominal mass were the main clinical findings. Signs of enterovesicular fistula and symptoms of incomplete large bowel obstruction were noticed in two and two patients, respectively. In three patients the abscess was diagnosed at the time of infliximab (Remicade) and in one during adalimumab (Humira), the anti-tumor necrosis-alpha monoclonal antibodies, administration. Abdominal computed tomography and transdermal abdominal ultrasonography were the most useful diagnostic procedures applied. Surgical drainage of the abscess was considered as the therapeutic method of choice and subsequently was applied in all patients. In half of them segmental enterectomy and end-to-end anastomosis was also performed within months after drainage. Postsurgical morbidity was generally low. In three patients the abscess reappeared during the follow-up period. **Conclusion:**

Intraabdominal abscess is a severe complication appearing in a proportion of patients with Crohn's disease mainly with terminal ileum involvement. Surgical drainage is the procedure of choice. Segmental enterectomy and end-to-end anastomosis is necessary in most of them after drainage. Intraabdominal abscess can be manifested during treatment with biologic agents (infliximab and adalimumab).

Key words: Crohn's disease, intraabdominal abscesses, inflammatory bowel disease, infliximab, adalimumab

INTRODUCTION

The development of intraabdominal abscess in the course of Crohn's disease (CD) represents a serious complication requiring prompt diagnosis and therapeutic intervention.¹⁻⁵ Drainage of the abscess, either surgical or under CT or ultrasound guidance is of great importance for the patient's outcome.

The rate of this complication varies in different series. So, in a series of 513 patients with CD who underwent surgery for various reasons, intraabdominal abscess was the cause of surgical intervention in 33 of them (6.4%).² A proportion of 9.9% was found in the study of Yamaguchi et al³, although a higher proportion (27.5%) has also been described⁴. In a Greek study the incidence of intraabdominal abscesses was 6.5%.⁶

The cause of this complication is not well understood. Various factors including treatment with biologic agents have been linked with the development of abdominal abscesses.

The aim of this study was to describe the clinicoepidemiological characteristics, diagnostic modalities and the treatment applied in a series of 17 patients with CD diag-

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nosed and followed-up in our IBD patients' center during the last twelve years.

PATIENTS AND METHODS

There were 9 men and 8 women of mean age 31+/-10 years. Only those patients in whom the abscess cavity was clearly outlined on ultrasonography, computed tomography, or magnetic resonance imaging were included in the study. All patients were hospitalized in our center and the initial diagnosis of the abdominal abscess was achieved in our department. These patients represent a percentage of 7.8 % (17 out of 218) of patients with CD seen and follow-up during this period. The disease was located in the terminal ileum except for four in whom both terminal ileum and colon were concurrently affected. The duration of the disease at the time of the analysis of the results was 6.7+/-4.0 years, while duration of the disease at the time of the diagnosis of abdominal abscess was 4.6+/-2.4 years. CD was active in all patients. Crohn's Disease Activity Index fluctuated between 198 and 390 points.

The type of medical treatment at the time of diagnosis of intraabdominal abscess is shown in table 1. A percentage of 29.4% of patients was under treatment with biologic agents (infliximab or adalimumab) at the time of diagnosis of intraabdominal abscess. Other clinicoepidemiological characteristics of patients are shown in table 1.

RESULTS

A) Clinical characteristics

The main clinical manifestations are shown in table 2. As it is shown, abdominal pain, palpable abdominal mass, and increase in the body temperature, were the main clinical manifestations. In two patients there were clinical signs of enterovesical fistulas. In the later cases the abscess was in contact with bladder. In one case, the inflammatory process produced clinical symptoms of obstructive ileus because of obstruction of the sigmoid due to compression of the bowel. The location of involvement was: abdominal wall, n=7(41.2%); peritoneal cavity, n=4(23.5%); retroperitoneum or iliopsoas, n=5(29.4%); and subphrenic region, n=1(6%). Intraabdominal abscess occurred most often on the right side 12(70.6%) and mainly near a site of surgical scar. In two patients (11.8%) the abscess was diagnosed at the time of treatment with anti-TNF- α agent infliximab (Remicade) and in one (6%) during adalimumab (Humira) administration. In one more patient, a woman aged 26 with small bowel involvement, the abscess appeared during the sixth month of gestation, while being under infliximab treatment. The course of the disease was stormy with high fever, abdominal pain and diarrhea. A spontaneous delivery appeared while the patient was awaiting the surgical drainage which finally applied one week after delivery. The newborn survived in the neonate intensive care unit. Two months later a surgical resection of the terminal ileum was performed while the pa-

Table 1. Clinicoepidemiological characteristics

Characteristic	Number	Percentage
Men	8	53%
Women	7	47%
Age	31+/-10	
Location		
Ileum	13	76.5%
Ileocolic disease	4	23.5%
CDAI (points)	220+/-39 (198 - 390)	
Duration of disease (years)	6.7+/-4.0	
Duration of disease at the time of abscess diagnosis (years)	4.6+/-2.4	
Treatment at the time of abscess diagnosis		
Corticosteroids	9	53%
Mesalamine	6	35.2%
Azathioprine	4	23.5%
Infliximab	4	23.5%
Adalimumab	1	5.9%

Table 2. Clinical manifestations at the time of abscess diagnosis.

Symptom	Number	Percentage
Abdominal pain	17	100%
Fever	14	82.3%
Palpable abdominal mass	13	76.5%
Loss of weight	10	58.8%
Anorexia	10	58.8%
Fatigue	7	41.1%
Symptoms of urinary infection	2	11.8%
Obstructive ileus	1	5.9%

tient's clinical situation was quite good and the various hematological disturbances had been restored. During the two years of follow-up the patient remained in a good clinical condition while continuing treatment with infliximab.

B) Diagnostic manipulations

Abdominal computed tomography and transdermal abdominal ultrasound were the most important diagnostic imaging modalities (Figures 1 and 2). These two techniques contributed significantly to the final diagnosis in all cases, because they detected the abscess in all patients. Magnetic Resonance Imaging also contributed to the final diagnosis performed in 9 patients.

C) Treatment

In all patients treatment consisted (among other) of a combination of antibiotics (including simultaneous administration of ciprofloxacin and metronidazole), and total parenteral nutrition. In all patients surgical drainage was finally applied, because conservative treatment failed to produce improvement, eliminate the abscess, or heal the fistula. Attempts to drainage the abscess under the guidance of CT or US prior the surgical drainage was applied in six patients. However, CT or US guided drainage produced temporary results thus making necessary the application of surgery.

D) Postsurgical complications

Significant postsurgical complications appeared in five patients. One patient developed a clinical picture of acute

pancreatitis which was accompanied later with formation of pseudocyst. In three patients the postoperative course was complicated by the appearance of an infection at the site of abdominal incisor. In another patient an enormous intraabdominal abscess appeared postsurgically. The abscess extended into the gluteal muscles and was accompanied by hypodermal flegmon of the posterior surface of the right crural. The abscess appeared after the administration of three doses of infliximab (the chimeric antibody against tumor necrosis factor-alpha). Postsurgical course was stormy with high fever, disturbances in serum electrolytes and nutritional deficits. Total parenteral nutrition was applied for three weeks with concurrent administration of life-saving antibiotics. Despite all these efforts the patient died after two more months with a clinical picture of generalized sepsis.

E) Follow-up

The course of the abscess after the drainage was generally uneventful except for the previously mentioned patient with the large abdominal abscess and the bad course in whom at least two reoperations were performed. In three more patients a recurrence of the abscess was noticed 9, 16 and 21 months after drainage of the abscess.

DISCUSSION

Intraabdominal abscesses represent a significant complication in the course of patients with CD. Intraabdominal abscesses appeared in up to 30% of patients with CD.⁴

Table 3. Therapeutic manipulations and results of treatment.

Therapeutic manipulation	Number of patients	Percentage
Surgical drainage	17	100%
Drainage under CT or US guidance	6	35.3%
Clinical improvement	16	94%
Postsurgical morbidity(*)	2	11.8%
Recurrence of abscess during follow-up	3	17.6%

(*) One patient with acute pancreatitis, pseudocyst and trauma sepsis

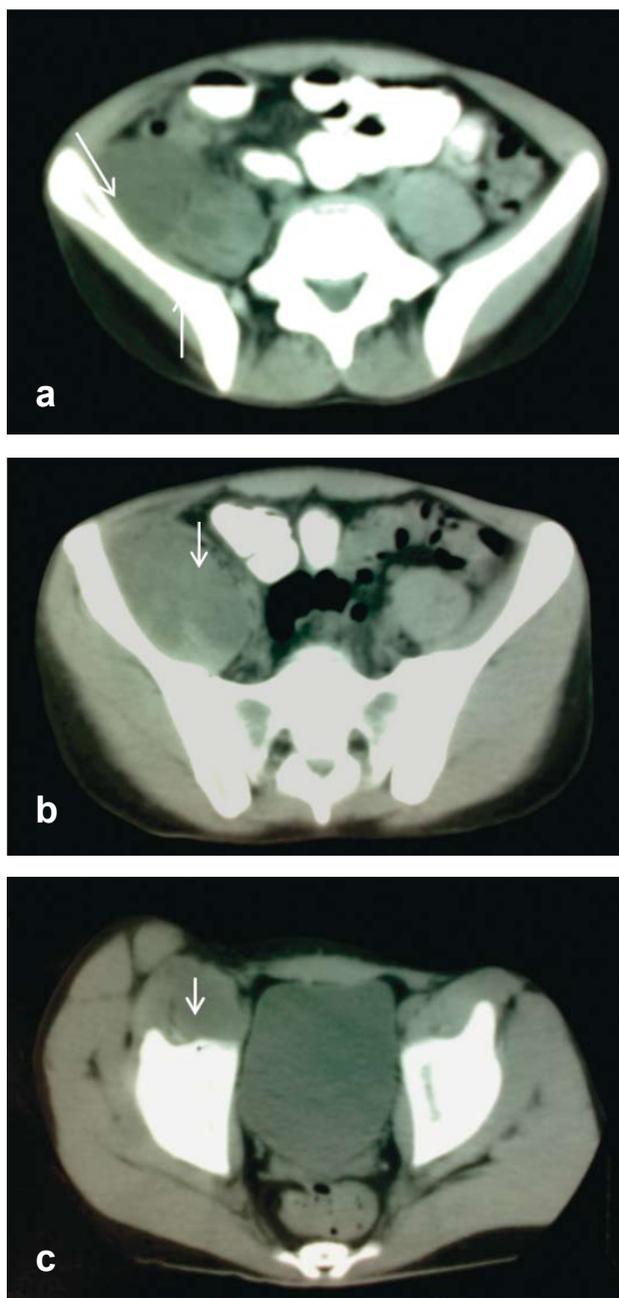


Figure 1. Computed tomography findings:
 - Abscesses of psoas and iliac muscle (arrow)
 - Abscesses in the area of iliopectus
 - Extension of abscess in the right crural muscle.

The proportion in our patients was 7.8 % (17 out of 218 patients with CD), and was similar to the percentage of intraabdominal abscesses reported in USA.² The mean age of the patients when the abscess developed was 31+/-11 years, almost identical to that reported in other series^{3,4}. Duration of disease at the time of data analysis and the appearance of abdominal abscess was 6.7+/-4.0 and 4.6+/-

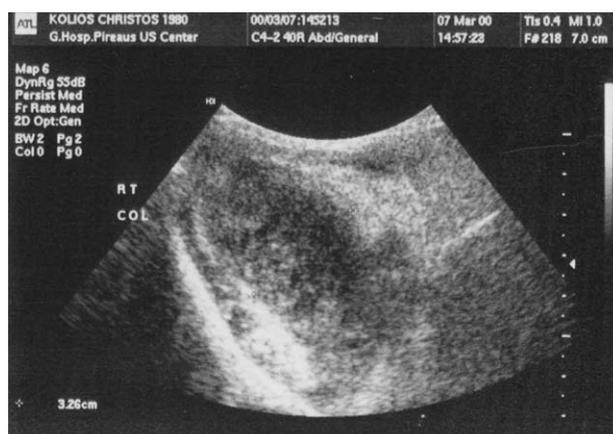


Figure 2. Transabdominal ultrasound of the patient of picture 1. A large intraabdominal abscess is obvious.

2.4 years, respectively. However, in other series the duration of illness, from the onset of CD until development of the abscess, was 10.8+/-6.3 years³. We have no obvious explanation for the above mentioned difference. Probably the nature of our center (referral center for inflammatory bowel disease) results in hospitalization of more severe cases with severe course of their disease.

The factors that predispose to the development of intraabdominal abscesses are not completely understood. It seems that the development of intraabdominal abscess could be a consequence of treatment with biologic agents⁷ as in four of our patients. It seems possible that the healing capacity of biologic agents could facilitate the formation of the abscess by encapsulating puss into the fistula. This possibility must be kept in mind when treating CD patients with biologic agents, although not all authors agree with this assumption. Other studies have found that the development of intraabdominal abscess in patients operated-on for their inflammatory bowel disease could be potentiated by low albumin levels, treatment with corticosteroids, and the presence of fistula.⁸

Forty-six percent of our patients were operated-on in the past for the underlying CD. In a relevant study, among 35 patients with abscess, 60% had previous surgery for their disease³. Similarly, among 39 patients with abscess, 61.5% had undergone surgery at the time of analysis of the results⁴, possibly indicating a more severe course of CD. Abscesses frequently develop on the right side of the abdomen and near the site of operative scar^{3,4}, as was the case in our patients, obviously as a result of the location of disease in the terminal ileum.

The diagnosis was greatly potentiated by the relevant clinical picture (palpable abdominal mass, abdominal pain,

fever, and abdominal tenderness), as well as by the findings of various imaging techniques (abdominal computed tomography, transdermal ultrasonography and magnetic resonance imaging).

Spiral CT is considered to be an ideal method for the diagnosis of intraabdominal abscess as it can detect abscesses in up to 100%⁹. However, transdermal abdominal ultrasound also helped us to reach the correct diagnosis. It has been estimated that in the hands of an experienced examiner, the sensitivity of abdominal ultrasound could reach the level of 100% with specificity of 92%¹⁰. Magnetic resonance imaging has been proposed from many years as a safe and sensitive method for the detection of intraabdominal abscesses¹¹. Finally, H₂O₂ has also been used in conjunction with ultrasound for the detection of abscesses and fistulas in patients with CD.¹² The method has an acceptable accuracy; it is safe and simple and can be repeated many times.

Treatment consists of a combination of conservative and surgical manipulations. While the conservative treatment, consisting mainly of administration of antibiotics and correction of various deficits, helps temporarily, surgical drainage is the treatment of choice. Drainage could also be achieved under computed tomography guidance. In the study of Gervais et al¹³ and Sahai et al,¹⁴ 50% of patients avoided surgical operation for at least six months while the rate of recurrence was similar to the rate after surgical drainage. The success rate of transdermal drainage of an abscess is directly related to the experience of the radiologist, surgeon, or gastroenterologist performing the procedure. The existence of multiple abscesses does not hinder transdermal drainage. In another study, conservative treatment (including drainage of abscess) alone was effective in 20% and surgery was needed in 80%³ although proportion of 94.4% requiring surgical drainage and intestinal resection has been described.⁴ In a recently published study,¹⁵ despite initial adequate drainage and resolution of the abscess, all patients eventually needed resection of the offending bowel segment. The authors suggest that surgical resection of the diseased bowel segment should be the definitive therapy.

In our patients, transdermal drainage under CT guidance was attempted in six cases with temporary results. Subsequently, all patients required surgical drainage. It seems that the rate of recurrence after surgical drainage of the abscess is lower compared to transdermal drainage under CT guidance⁵. The available data are in favor of transdermal drainage in selective cases in which this procedure seems to be technically feasible¹⁶. Laparoscopic drainage could be a possible therapeutic modality although it is di-

rectly related to the experience of the surgeon performing the procedure.¹⁷

It has been suggested that early complications after elective abdominal surgery for CD, including abscess formation, are not associated with use of steroids, immunosuppressives, or infliximab.¹⁸ However, in a recent study, infliximab use within 3 months before surgery was associated with increased postoperative sepsis, abscess, and readmissions in Crohn's patients.¹⁹

Abscesses often recur within 3 years, even after successful drainage.³ In our series, 3 patients (17.6%) developed recurrence of the abscess during the follow-up period. Because of the relatively high rate of recurrence, a therapeutic strategy should be formulated for each patient and strict follow-up observation should be mandatory.²⁰ Crohn's disease patients with intraabdominal abscess can safely undergo planned resection with primary anastomosis if initially treated with successful percutaneous drainage and aggressive antibiotic and steroid management.

The results of the present study could be summarized as follows:

1. The development of intraabdominal abscess happens mainly in patients with ileal involvement.
2. The drainage of the abscess is necessary in all cases. In this series of patients surgical drainage was applied in all patients.
3. All patients need to be operated-on. Partial enterectomy of the affected bowel and end-to-end anastomosis is almost unavoidable.
4. Drainage of the abscess results in prompt improvement of the clinical situation.
5. The development of intraabdominal abscess could be related to the use of biologic agents (infliximab and adalimumab)

REFERENCES

1. Ayuk P, Williams N, Scott NA, Nicholson DA, Irving MH. Management of intra-abdominal abscesses in Crohn's disease. *Ann R Coll Surg Engl* 1996;78:5-10.
2. Hurst RD, Molinari M, Chung TP, Rubin M, Michelassi F. Prospective study of the features, indications, and surgical treatment in 513 consecutive patients affected by Crohn's disease. *Surgery* 1997;122:661-667.
3. Yamaguchi A, Matsui T, Sakurai T, et al. The clinical characteristics and outcome of intraabdominal abscess in Crohn's disease. *J Gastroenterol* 2004;39:441-448.
4. Wang XB, Zhu WM, Ren JA, Li N, Li JS. Clinical charac-

- teristics and surgical treatment of Crohn disease complicated with intra-abdominal abscess. *Zhonghua Wei Chang Wai Ke Za Zhi* 2007;10:204-207.
- Garcia JC, Persky SE, Bonis PA, Topazian M. Abscesses in Crohn's disease: out-come of medical versus surgical treatment. *J Clin Gastroenterol* 2001;32:409-412.
 - Triantafillidis JK, Emmanouilidis A, Nikolakis D, Cheracakis P, Kogevinas M, Merikas E. Surgery for Crohn's disease in Greece: a follow-up study of 79 cases. *Hepatogastroenterology* 2001;48:1072-1077.
 - Present DH, Rutgeerts P, Targan S. et al. Infliximab for the treatment of fistulas in patients with Crohn's disease. *N Engl J Med* 1999;340:1398-1405.
 - Yamamoto T, Allan RN, Keighley MR. Risk factors for intra-abdominal sepsis after surgery in Crohn's disease. *Dis Colon Rectum* 2000;43:1141-1145.
 - Molnar T, Papos M, Gyulai C, et al. Clinical value of technetium-99m-HMPAO-labeled leukocyte scintigraphy and spiral computed tomography in active Crohn's disease. *Am J Gastroenterol* 2001;96:1517-1521.
 - Gasche C, Moser G, Turetschek K, Schober E, Moeschi P, Oberhuber G. Transabdominal bowel sonography for the detection of intestinal complications in Crohn's disease. *Gut* 1999;44:112-117.
 - Haggett PJ, Moore NR, Shearman JD, Travis SP, Jewell DP, Mortensen NJ. Pelvic and perineal complications of Crohn's disease: assessment using magnetic resonance imaging. *Gut* 1995;36:407-410.
 - Maconi G, Parente F, Porro GB. Hydrogen peroxide enhanced ultrasound-fistulography in the assessment of enterocutaneous fistulas complicating Crohn's disease. *Gut* 1999;45:874-878.
 - Gervais DA, Hahn PF, O'Neill MJ, Mueller PR. Percutaneous abscess drainage in Crohn's disease: technical success and short- and long-term outcomes during 14 years. *Radiology* 2002;222:645-651.
 - Sahai A, Belair M, Gianfelice D, Cote S, Gratton J, Lahaie R. Percutaneous drainage of intra-abdominal abscesses in Crohn's disease: short and long-term outcome. *Am J Gastroenterol* 1997;92:275-278.
 - Neufeld D, Keidar A, Gutman M, Zissin R. Abdominal wall abscesses in patients with Crohn's disease: clinical outcome. *J Gastrointest Surg.* 2006;10:445-449.
 - Poritz LS, Koltun WA. Percutaneous drainage and ileocelectomy for spontaneous intraabdominal abscess in Crohn's disease. *J Gastrointest Surg* 2007;11:204-208.
 - Wu JS, Birnbaum EH, Kodner IJ, Fry RD, Read TE, Fleshman JW. Laparoscopic-assisted ileocolic resections in patients with Crohn's disease: are abscesses, phlegmons, or recurrent disease contraindications? *Surgery* 1997;122:682-688.
 - Appau KA, Fazio VW, Shen B, et al. Use of infliximab within 3 months of ileocolonic resection is associated with adverse postoperative outcomes in Crohn's patients. *J Gastrointest Surg* 2008;12:1738-1744.
 - Colombel JF, Loftus EV Jr, Tremaine WJ, et al. Early postoperative complications are not increased in patients with Crohn's disease treated perioperatively with infliximab or immunosuppressive therapy. *Am J Gastroenterol* 2004;99:878-883.
 - Jawhari A, Kamm MA, Ong C, Forbes A, Bartram CI, Hawley PR. Intra-abdominal and pelvic abscess in Crohn's disease: results of noninvasive and surgical management. *Br J Surg* 1998;85:367-371.