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Original Article

# Approach to the diagnosis and treatment of mesenteric panniculitis from the surgical point of view

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ABSTRACT

**Objective:** To evaluate the diagnostic and treatment approaches for patients diagnosed with mesenteric panniculitis

**Material and Methods:** We retrospectively reviewed all patients diagnosed with mesenteric panniculitis between January 2010 and March 2016. We recorded the demographic features, clinical symptoms, laboratory values, radiological methods, treatment approach, and outcomes of the patients.

**Results:** We evaluated 22 patients (17 male and five female) with a mean age of 45.8±15.7 years. The most frequent complaint was abdominal pain. The patients' histories included colon cancer (n=1), prostatic cancer (n=2), renal cell cancer (n=1), diabetes mellitus (n=4), and chronic obstructive pulmonary disease (n=1). Laboratory values revealed elevated C-reactive protein levels in 14 patients (43%). Computed tomography was performed in all the patients. Only 10 patients were followed up in the surgical ward, the remaining 12 underwent outpatient treatment. No complication associated with hospitalization or during outpatient follow-up period was observed.

**Conclusion:** Mesenteric panniculitis can be successfully treated conservatively without surgical intervention. Clinical doubt is of great importance for diagnosis, and plausible underlying malignancy should be kept in mind.

**Keywords:** Abdominal mass, acute abdomen, conservative approach, mesenteric disorders, mesenteric panniculitis

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## INTRODUCTION

Mesenteric panniculitis (MP) is defined as the development of chronic inflammation and necrosis of adipose tissue of the mesentery, resulting in fibrosis. The outcome of MP is usually good (1-3). MP was first described in 1924 by Jura and has also been referred to as sclerosing mesenteritis, liposclerotic mesenteritis, mesenteric lipodystrophy, or mesenteric Weber–Christian disease (4-7). Although a definitive cause of MP has not been defined so far, several comorbidities such as diabetes, hypertension, rheumatic diseases, and particularly abdominal and pelvic malignancies have been reported (8, 9).

Mesenteric panniculitis can be diagnosed with same findings as a large abdominal mass. While the most common symptom is abdominal pain, nausea and vomiting may also be seen. Some patients are diagnosed with only intestinal obstruction. However, most cases incidentally emerge during imaging studies unrelated with the symptoms. Although computed tomography (CT) is not always helpful in the differential diagnosis of MP from primary or secondary mesenteric tumors, some characteristic findings suggest MP (10). The characteristic CT findings of MP are as follows: a tumoral pseudocapsule (a fatty mass separated from the base of the mesentery), an adipose ring (a normal adipose tissue surrounding the mesenteric vessels), and an intra-abdominal mass displaced adjacent bowel loops without invasion (10). As positron-emission tomography is a good alternative method to rule out malignancy for focal mesenteric masses, the most common technique used for diagnosis is CT; however, surgical approach is still the best method for definite diagnosis (11, 12).

In most cases, MP can limit itself and even regression can be seen without medical treatment during follow-up. Clinical symptoms can subside with agents such as corticosteroids, colchicine, cyclophosphamide, and tamoxifen without surgery. MP is considered not to be precancerous, and long-term follow-up is not needed (11). In this study, we aimed to analyze the outcome of patients who were diagnosed with MP and treated.

## MATERIAL AND METHODS

We retrospectively reviewed all patients diagnosed with MP between January 2010 and March 2016. Informed consent was obtained from all patients. Patients' demographic characteristics, clinical symptoms, laboratory results, imaging methods, treatment approaches, and outcome were recorded. This study was conducted in accordance with the Declaration of Helsinki.

In our study, in the diagnosis of MP the main radiological findings in CT imaging were as follows: (i) the presence of a nonhomogeneous, well-demarcated fat mass in the mesentery of the small intestine, (ii) including superior mesenteric vessels without invading them, (iii) pushing the intestines to the edge without invasion, and (iv) the presence of lymph nodes with a short axis of <10 mm. The size of the mass, density, calcification status, presence and size of lymph nodes, oil ring sign, and pseudocapsule formation were evaluated.

The results were analyzed using SPSS version 21.0 (Statistical Package for the Social Sciences Inc, IBM, Armonk, NY, USA). The numerical variables were expressed as mean ± standard deviation or median (range) based on the distribution pattern, whereas the categorical variables were presented as absolute values and percentages.

## RESULTS

We evaluated 22 patients (17 male and five female) with a mean age of 45.8±15.7 years. Of these patients, nine with severe abdominal pain and high leukocyte levels (41%) were treated by hospitalization, whereas 12 without leukocytosis (59%) were treated as outpatients. The hospitalized patients were treated with 2*1 g daily dosage of cefazolin intravenously (Cefazolin® Bilim Pharmaceuticals, Istanbul, Turkey); the outpatients were followed up with an anti-inflammatory drug treatment, without antibiotherapy.

When the clinical history of the cases was evaluated, three patients had undergone abdominal surgery previously (colon cancer, one patient and prostate cancer, two patients), and one patient was incidentally diagnosed with renal cell cancer. In addition, four patients had diabetes mellitus (DM), and one patient had pulmonary disorder (asthma). When the body mass index (BMI) of the patients was assessed, five had BMI >35 (22.7%) and seven had a BMI of 30–35 (32%). The most common symptom at the time of admission was abdominal pain (90%), whereas the other complaints included fatigue, loss of appetite, nausea, and vomiting. The median C-reactive protein (CRP) level at the time of diagnosis was 26.9 mg/L (range, 0.44–573 mg/L); the mean white blood cell (WBC) count was 10.690±3.504/mL (normal range, 4.500–10.500/mL) (Table 1).

All patients underwent abdominal ultrasonography (USG) and abdominal CT. Only four patients showed findings consistent with MP following USG (18%), whereas all other patients were diagnosed with MP considering CT findings (Figure 1).

Complications related to MP did not occur in any patients during the treatment and follow-up period of 1–6 months. One patient was conservatively treated again after 2 months due to the recurrence of pathology.

Table 1. Characteristics of patients treated for MP

| No patients | Age | Sex | Treatment approach. | BMI kg/m$^2$ | Clinical findings | WBC/mL | CRP mg/L | Follow-up (month) |
|---|---|---|---|---|---|---|---|---|
| 1 | 40 | M | OP-FU | 35.5 | Abdominal pain, fatigue | 19.600 | 206 | 6 |
| 2 | 50 | M | IH-FU | 38.7 | Abdominal pain | 14.100 | 26 | 6 |
| 3 | 48 | F | IH-FU | 32 | Abdominal pain | 5.920 | 0.44 | 4.5 |
| 4 | 56 | F | IH-FU | 30.1 | Abdominal pain | 8.330 | 121 | 4 |
| 5 | 48 | M | IH-FU | 37 | Abdominal pain, vomiting | 10.200 | 11 | 6 |
| 6 | 20 | F | OP-FU | 24 | Abdominal pain, dysuria | 8.370 | 69 | 2 |
| 7 | 54 | M | OP-FU | 34.8 | abdominal distention, vomiting | 13.200 | 60 | 6 |
| 8 | 18 | M | IH-FU | 23.2 | Abdominal pain | 8.750 | 3 | 6 |
| 9 | 52 | F | OP-FU | 33.1 | Abdominal pain | 7.949 | 3. | 4 |
| 10 | 70 | M | OP-FU | 26 | Abdominal pain | 9.600 | 149 | 3.5 |
| 11 | 52 | M | OP-FU | 29.8 | Nausea, vomiting | 10.000 | 27.8 | 5 |
| 12 | 34 | M | OP-FU | 28 | Abdominal pain | 8.330 | 24 | 3 |
| 13 | 36 | M | OP-FU | 41 | Malaise | 9.840 | 0.8 | 6 |
| 14 | 25 | F | OP-FU | 24.1 | Abdominal pain, loss of appetite | 10.650 | 3 | 5 |
| 15 | 49 | M | IH-FU | 32 | Abdominal pain | 16.700 | 573 | 6 |
| 16 | 38 | M | IH-FU | 32.6 | Abdominal pain, nausea, vomiting | 15.900 | 58 | 2.5 |
| 17 | 63 | M | IH-FU | 23 | Abdominal pain | 13.500 | 115 | 6 |
| 18 | 60 | M | OP-FU | 40 | Abdominal pain | 8.500 | 32 | 6 |
| 19 | 57 | M | OP-FU | 33 | Abdominal pain | 12.000 | 21 | 4 |
| 20 | 78 | M | IH-FU | 29.8 | Abdominal pain, loss of appetite, malaise | 7.230 | 4 | 6 |
| 21 | 33 | M | OP-FU | 30.5 | Abdominal pain | 7.980 | 3.8 | 1 |
| 22 | 28 | M | IH-FU | 25.1 | Abdominal pain | 7.470 | 32.4 | 1 |

BMI: Body Mass Index; CRP: C-reactive protein; WBC: white blood cell; M: Male; F: Female; OP-FU: outpatient follow-up; IH-FU: in-hospital follow-up

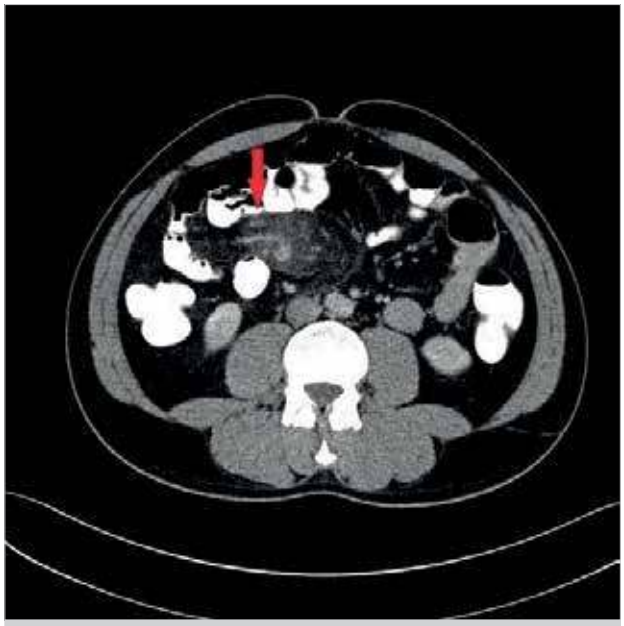

Figure 1. Computed tomography appearance of the increased attenuation in the root of the mesentery and enlarged lymph nodes

## DISCUSSION

Mesenteric panniculitis is a nonspecific inflammatory pathological condition affecting the mesenteric adipose tissues of the small and large intestines. In almost all cases, histologically MP has three main components as follows: necrosis of the adipose tissue, chronic inflammation, and fibrosis. These components are reflecting the different phases of the natural course of a single disease (13). Mesenteric disorders are classified based on the main component of the pathology: fat necrosis, fibrosis, and chronic inflammation in the mesentery resulting in mesenteric lipodistrophy, sclerosing mesenteritis, and MP, respectively. The most appropriate diagnostic term for most of the patients with mesenteric disorders is sclerosing mesenteritis due to the varying degrees of fibrosis (14). However, considering our results, the histopathological main component of the patients in our series was mostly chronic inflammation that resulted in acute MP. The etiology of MP is thought to be associated with several diseases. Vasculitis, granulomatous diseases, rheumatic diseases, malignancies, pancreatitis, previous abdominal surgeries or trauma, ischemic injury, and infections are among the underlying conditions (5, 7). The most common causes include autoimmune disorders and malignancy (15, 16). Three patients in our series were diagnosed with a malignancy, whereas four were diagnosed with DM.

Obesity is known to have an association with infection risk and delayed wound healing. The severity and incidence of inflammatory events is higher in obese patients than in those having a BMI of 20–25 kg/m$^2$, and the antibody response against antigens is weaker (17). The anatomic, metabolic, and biochemical characteristics of adipose tissue can also be the risk factors for intestinal and mesenteric diseases. Our study showed that the overall BMI was high in almost all patients; BMI was between 30 and 35 kg/m$^2$ in seven patients and over 35 kg/m$^2$ in five patients. This could be related to obesity-induced immune dysfunction.

In a post-mortem case series with >700 cases of MP, the incidence of MPs was 1%. It was mostly diagnosed in the sixth decade and was found to be two-fold higher in men (18). Although MP is usually located in the small bowel mesentery, the frequency of mesocolon location is approximately 20% (19, 20). The demographic features in our series were consistent with the literature.

The clinical symptoms induced by MP may vary and are nonspecific. The most commonly observed symptoms are abdominal pain and abdominal mass and the less frequently ones are nausea, vomiting, constipation, diarrhea, weight loss, and rectal bleeding (3, 18, 21); however, it can be asymptomatic as well. In our study, all patients were symptomatic; the most common symptom was abdominal pain.

The laboratory values are usually within normal limits. Elevated WBC counts, sedimentation rates, and CRP or anemia have been reported but are not common (22, 23). However, these laboratory values were mostly higher than the normal range in our study. This was why some of the patients were followed up in a surgical ward, although most were treated as outpatients.

Imaging studies have an important role in the diagnosis of MP. Although the abdominal X-ray has no diagnostic value, abdominal USG and CT are of great importance for diagnosis (24, 25). Furthermore, abdominal CT findings may be quite sufficient in the diagnosis of MP due to its high specificity (5). It should be noted that various nonspecific radiological findings of MP such as calcification can also be observed (1, 2, 26). In our study, CT revealed misty mesentery in most of the patients.

There is no consensus on the treatment of MP. Treatment approaches in the literature mostly consist of supportive procedures regarding symptoms. There has been no large randomized controlled study evaluating the efficacy of steroids and immunosuppressive treatment, although clinical improvement was noted with these treatment regimens. Ginsburg et al. (19) reported that three-fourths of symptomatic patients who were administered thalidomide showed a regression of symptoms (22). In our study, patients with comorbidities, significant abdominal pain, and elevated WBC were treated with parenteral antibiotherapy and followed up in the surgical ward. Anti-inflammatory analgesics were administered to the patients who were followed up, and no complications related to MP were seen during the follow-up.

## CONCLUSION

Mesenteric panniculitis is one of the rare causes of abdominal pain, and its etiology is still unclear. Diseases affecting the immune system, such as obesity and DM, are thought to be the underlying disorders. Patients diagnosed with MP should be carefully investigated for concomitant diseases, particularly malignancies, with respect to the etiology. Even though there is no consensus about the treatment options, antibiotherapy seems to be an effective treatment option, particularly for patients with elevated inflammatory markers.

**Ethics Committee Approval:** Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects".

**Informed Consent:** Written informed consent was obtained from patient who participated in this study.

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