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Mesenteric panniculitis, a study of 5 patients using daily olive oil including a husband and wife, could this have a role in the etiology ?

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Abstract

Mesenteric panniculitis (MP) is a rare fibroinflammatory disease of unknown etiology that usually affects the small-bowel mesentery, although it has also been shown to affect the mesocolon in 20% of all reported cases. Rare sites of involvement include mesoappendix, peripancreatic area, omentum, and pelvis. During our practice in UAE we came across 13 cases of mesenteric panniculitis over the last 3 years of them 5 were using daily olive oil, 2 of them are non-blood related Palestinian husband and wife. To our knowledge this is the first report of mesenteric panniculitis in the same family in a husband and wife and 3 more patients associated with regular olive oil intake. The unique thing about these patients is the daily use of olive oil as part of their habits. Further studies are needed to look for the association between regular intake of olive oil and mesenteric panniculitis.

Keywords: Mesenteric panniculitis, Familial, Olive oil, CT scan, UAE

Introduction

Mesenteric panniculitis (MP) is a rare, non-neoplastic inflammatory and fibrotic disease that affects the mesentery, can affect the integrity of the gastrointestinal lumen and mesenteric vessels by a mass effect and can result in a variety of gastrointestinal and systemic manifestations, including abdominal pain, nausea and vomiting, diarrhea, weight loss, and fever [1-3]

Although MP has been reported in persons as young as three years of age, it is diagnosed most commonly in the fifth to seventh decades of life, with a median age of 65 years [3,4].The low prevalence in childhood and adolescence may be attributable to a smaller amount of mesenteric fat [5].

Abdominal imaging is the mainstay for the diagnosis of the MP, and the advent of CT scan has drastically improved the diagnostic incidence. MP can be visualized on abdominal ultrasound, CT scan, and MRI, but CT scan is the most utilized imaging modality recorded in the literature [6]. The typical CT findings of MP includes: (i) the presence of a well-defined "mass effect" on neighboring structures, (ii) non homogeneous higher attenuation mesenteric fat tissue than adjacent retroperitoneal or mesocolonic fat, (iii) containing small soft tissue nodes (iv) a fatty "halo sign" indicating the preservation of a halo of fat around the involved vessels; and (v) a hyper-attenuating pseudo capsule [7]

They divided MP into three categories which are sclerosing (retractile) mesenteritis, mesenteric panniculitis, and mesenteric lipodystrophy depending on variable degrees of fibrosis, chronic inflammation, and fat necrosis. Histological specimens with more fibrosis are categorized as "retractile" disease, panniculitis has fat necrosis with an inflammatory component, and lipodystrophy specimen have predominately fat necrosis. Although, most authors admit that these components are simultaneously present within any histology specimen [8]

The cause of MP remains unclear, although several possible causes have been proposed in the literature including previous abdominal surgery, abdominal trauma, autoimmunity, vasculitis, malignancy and infection [4, 5, 9].

Although the mentioned causes in the literature included abdominal trauma or surgery, autoimmune disease including IgG4 related disease, para neoplastic syndromes and ischemia, no mention in the literature about the possible association of dietary fat and olive oil regular intake.

Case studies

Out of 13 cases we investigated in our center 2 were a Palestinian husband and wife,

Patient 1 The wife presented at age 54 BMI 30 with controlled hypertension, hyperlipidemia, hyperuricemia ,presented with vague abdominal pain and joint pains, developed severe reaction to non steroidal celecoxib in the form of severe Reynaud's phenomena with an attacks of minor cerebrovascular event that settled down, her dietary history included daily use of olive oil liquid for many years as part of their Palestinian diet ,below is her ultra sound and CT scan showed thickening of the mesentery **(Figure 1)**.

Patient 2 The husband aged 62 normal BMI ,controlled hypertension, hyperlipidemia and hyper uricemia presented a year later with vague discomfort in the abdomen, using the same diet with regular use of olive oil , ultra sound and CT scan showed features suggestive of MP, pictures below :mass-like area of heterogeneously increased fat attenuation is seen involving the small-bowel mesentery, centered at midline and left side of the abdomen, displacing small bowel loops and surrounds the mesenteric vascular structures, measuring 8x13.5x12 cm in dimensions **(Figure 2).**

Patient 3 Algerian 38 years male patient with daily intake of olive oil also presented with abdominal pain and the ultrasound and CT scan showed typical appearances MP **(Figure 3)**.

Patient 4 Iraqi 62 Female hypertension on amlodipine valsartan, presented with recurrent abdominal pain, laboratory showed microscopic hematuria, elevated amyloidal A protein amyloidosis, use olive oil liquid daily. CT scan below typical features of MP **(Figure 4)**.

Patient 5 Libyan 38 Female BMI 30 diabetic, fatty liver, elevated liver enzymes, the ultra sound and CT scan showed MP **(Figure 5)**.

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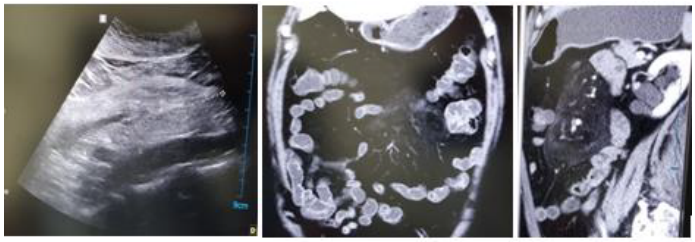

Figure 1: Ultra sound and CT scan showing thickening of the mesentery in Patient 1.

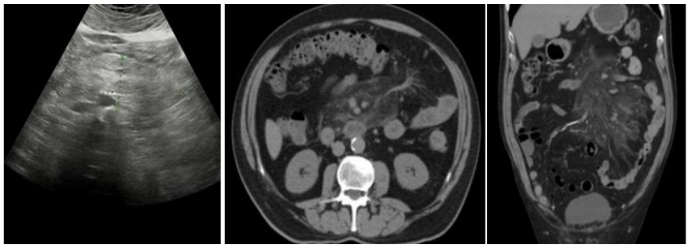

Figure 2: Ultra sound and CT scan showing Mesenteric panniculitis in Patient 2.

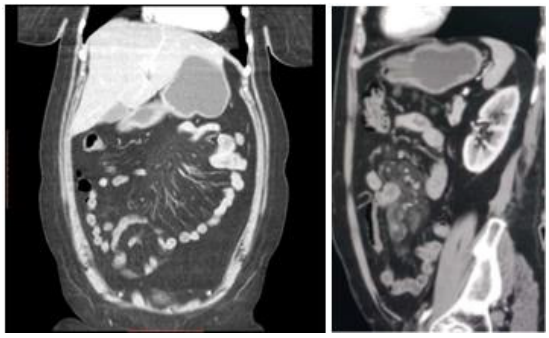

Figure 3: Ultra sound and CT scan showing Mesenteric panniculitis in Patient 3.

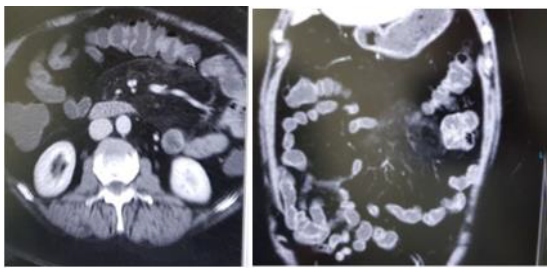

Figure 4: Ultra sound and CT scan showing Mesenteric panniculitis in Patient 4.

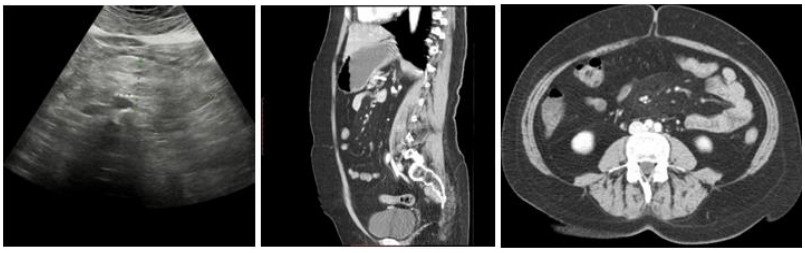

Figure 5: Ultra sound and CT scan showing Mesenteric panniculitis in Patient 5.

The unique thing about all these patients is the daily use of olive oil as part of their tradition.

Further studies are needed to check for this association between olive oil and MP.

Discussion

MP is a chronic inflammatory process mainly involving fatty tissue of the mesentery. A previous report showed that around 40% of cases had no symptoms [10]. However, the most common presenting complaint is abdominal pain. A recently published systematic review of 192 cases of sclerosing mesenteritis revealed the symptomatology as abdominal pain in 78.1%, fever 26.0%, weight loss 22.9%, diarrhea 19.3%, vomiting 18.2%, anorexia 13.5%, constipation 10.9%, bloating 9.4%, malaise 5.7%, nausea 5.7%, pain with eating 4.7%, and fatigue 2.1% of patients [11]. The main presentation of our cases was vague abdominal pain and bloating.

MP is usually diagnosed during the fifth or sixth decade of life and it is twice as common in men, however out of 5 cases of our patients 2 subjects were younger than forty years and 3 patients were males.

Although the gold standard for the diagnosis of MP is histopathological examination of the mesentery, none of our patients underwent histopathological examination and we considered them to have MP according to the findings on CT examinations [8]. The main CT findings of our patients were mass lesion and thickening of the mesentery.

The etiology of MP is still unknown. Generally, MP develops in a wide variety of conditions, few reports have shown a high association of malignant neoplasia with MP, which has thus been considered a neoplastic syndrome [12, 13]. Nevertheless, other articles have suggested that the prevalence of malignancy in MP was not higher than that in the general population [11,14].

We did not observe any neoplasia in our cases clinically or by imaging. Patients with MP have been reported to often have a past history of abdominal surgery or trauma [11]. Our patients had no history of recent abdominal surgery or trauma. In a recent review, the theory of abnormal postsurgical healing and ischemia to the mesentery, as a source of MP, seemed plausible [11]. However, Emory et al. showed that only four of 84 cases with MP had a history of trauma and surgery [8]. Although some studies suggested autoimmunity as a cause of panniculities especially to IgG4 related diseases, a recent paper suggested that most cases of MP are more likely to be an IgG4-related diseases mimic and that IgG4 seemingly seldom, if ever, affects this anatomic site [15].

To the best of our knowledge, there is no previous reports investigated the relation between MP and high fat intake such as regular high intake of olive oil. The mesentery is an organ that attaches the intestines to the posterior abdominal wall and it helps in storing fat and communicates with intestine through blood vessels, lymphatics, and nerves. So, it is accepted with high fat intake as with daily olive oil ingestion, there will be more fat deposition in the mesentery. Visceral fat such that of mesentery is hormonally active tissue, it releases different inflammatory mediators and hormones, such as adiponectin, leptin, tumour necrosis factor, resistin and interleutin 6 (IL-6)[16]. One of our patients with no olive oil intake used keto high fat diet and developed MP.

Although, the beneficial impact of olive oil has been well known for centuries, in our patient daily high intake was associated with mesenteric panniculitis in 5 patients. This can be explained by first, the high daily intake of oil could induce inflammation of the mesentery. In support of this assumption all patients have been overweight or obese have dyslipidemia or on lipid lowering therapy and all of them have fatty liver as detected by ultrasound. Second, the chemical composition of olive oil varies depending on the extraction technology.

Modest health benefits are associated with consuming olive oil are largely due to the beneficial plant chemicals, such as polyphenols and plant sterols, found in the extra virgin olive oils, but these plant chemicals are largely lost in the more processed 'light' olive oils. These phytochemicals may provide some protection from the harmful effects caused by consuming a high-fat meal."[17].

Data suggest that mesenteric events contribute to the regulation of systemic fibrinolytic, inflammatory, and coagulation cascades. If dietary antigens are bound to chylomicrons, they would then be transported to chylomicron target tissues, such as mesenteric lymph nodes (MLN). Transport of dietary antigens to MLN could promote oral tolerance to the antigen, since this is the common immune response in these lymph nodes. Thus, chylomicron-dependent antigen absorption is hypothesized to promote oral tolerance [18]. The short-term ingestion of olive oil produced more chylomicrons than did the other dietary oils, which may have been due to differences in the metabolic handling of olive oil within the gut, although, mesenteric panniculitis could be induced by high intake of olive oil, mesentery is a critically important site for the induction of oral tolerance and anti-inflammatory benefits related to olive oil [19].

Conclusions

Mesenteric panniculitis is a benign condition, sometimes asymptomatic, its presentation as a chronic abdominal pain, rarely reported, can be diagnosed from an ultrasound and confirmed by CT scan of the abdomen. The specific etiology of the disease is unknown, the possible relation to olive oil use need to be studied in larger case control study. Hopefully recognition of the existence of this condition should lead to increased awareness among surgeons, physicians and radiologists when considering their differential diagnoses.

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