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Computed Tomography / Tomodensitométrie

The Prevalence of Incidentally Detected Idiopathic Misty Mesentery on Multidetector Computed Tomography: Can Obesity Be the Triggering Cause?

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Abstract

Purpose: Misty mesentery appearance is commonly reported in daily practice, usually as a secondary finding of various pathological entities, but sometimes it is encountered as an isolated finding that cannot be attributed to any other disease entity. We aimed to assess the prevalence of cases with incidentally detected idiopathic misty mesentery on computed tomography (CT) and to summarize the pathologies leading to this appearance.

Methods: Medical records and initial and follow-up CT features of patients with misty mesentery appearance between January 2011 and January 2013 were analysed. The study included cases with no known cause of misty mesentery according to associated CT findings, clinical history, or biochemical manifestations, and excluded patients with diseases known to cause misty mesentery, lymph nodes greater than a short-axis diameter of 5 mm, discrete mesenteric masses, or bowel wall thickening.

Results: There were a total of 561 patients in whom misty mesentery appearance was depicted on abdominopelvic CT scans. A total of 80 cases were found to have isolated incidental idiopathic misty mesentery, giving a prevalence of 7%. The common indication for CT examination was abdominal pain. There was a slight female predominance (51.3%). 67.5% of all patients were classified as obese and 17.5% as overweight.

Conclusions: The results of the present study show that idiopathic incidental misty mesentery appearance has a significant prevalence. Also, the high body mass index of these patients and the growing evidence of obesity-induced inflammatory changes in adipose tissue are suggestive of an association between obesity and misty mesentery appearance on CT.

Résumé

Objet : Il est assez fréquent d'observer un mésentère d'aspect flou dans le cadre de la pratique quotidienne de la radiologie. Bien qu'il s'agisse habituellement d'une constatation secondaire liée à diverses entités pathologiques, il peut s'agir, à l'occasion, d'une constatation isolée non imputable à aucune autre entité morbide. Notre objectif consistait à mesurer la prévalence des observations fortuites de mésentère d'aspect flou idiopathique lors d'une tomodensitométrie (TDM), et à faire un résumé des affections qui donnent lieu à de telles constatations.

Méthodes : Nous avons analysé les dossiers médicaux ainsi que les résultats des tomodensitométriques initiaux et de suivi de patients chez qui un mésentère d'aspect flou a été observé entre janvier 2011 et janvier 2013. L'étude incluait les patients dont les résultats de tomodensitométrie, les antécédents cliniques et les manifestations biochimiques n'ont pas permis de déterminer les causes de l'aspect flou. Elle excluait toutefois les patients qui ont présenté des affections que l'on savait causer cet aspect flou ou qui ont présenté des ganglions lymphatiques dont le diamètre de petit axe était supérieur à 5 mm, des masses mésentériques discrètes ou un épaississement des parois intestinales.

Résultats : Un mésentère d'aspect flou a été décelé chez 561 patients à l'examen de TDM abdominopelvienne. Quarante-vingts cas d'observation fortuite et isolée de mésentère d'aspect flou idiopathique ont été relevés, ce qui équivaut à une prévalence de 7 %. L'examen de tomographie par ordinateur s'est avéré le plus souvent indiqué en raison de douleurs abdominales. Une légère prédominance féminine a par ailleurs été relevée (51,3 %). Enfin, 67,5 % des patients ont été réputés être obèses, alors que 17,5 % ont été réputés faire de l'embonpoint.

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Conclusion : La présente étude révèle que la prévalence des observations fortuites de mésentère d'aspect flou idiopathique est significative. L'indice de masse corporelle élevé des patients et les preuves de plus en plus nombreuses que l'obésité modifie les facteurs inflammatoires des tissus adipeux suggèrent aussi une corrélation entre l'obésité et l'aspect flou du mésentère à l'examen de TDM.

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Key Words: Misty mesentery; Multidetector computed tomography; Obesity; Prevalence

The term “misty mesentery” is used to describe the pathological increase in mesenteric fat attenuation in computed tomography (CT). This term was introduced by Mindelzun et al [1] as a descriptive imaging finding with an extensive differential diagnosis. It is commonly observed on CT scans performed during daily clinical practice, and when radiologists encounter this imaging finding, they should consider various pathological entities that could lead to this appearance, including infiltration of mesenteric fat and adjacent organs by fluid (ie, oedema, lymph, or blood), fibrous tissue, inflammatory or neoplastic cells [1–3].

Misty mesentery is also considered to be an important CT sign indicating early stages of sclerosing mesenteritis, which is a rare disease characterised by chronic nonspecific inflammation of the adipose tissue of the bowel mesentery (the result of invasion of the mesentery by lipid-laden macrophages) [2,3]. The cause of sclerosing mesenteritis remains unclear and the diagnosis of the disease requires exclusion of neoplastic or other inflammatory causes and may finally require histologic confirmation [2,4–7].

This study was initiated after we had noted that some patients who had undergone abdomen CT for an unrelated reason were incidentally found to have segmental misty mesentery with unknown cause, which could not be associated to other CT findings, patient history, or clinical/biochemical manifestations. Additionally, none of the patients had discrete mesenteric masses or hyperdense pseudocapsules (peripheral attenuation limiting the mass), which are the diagnostic features for sclerosing mesenteritis [8]. Because the patients did not meet the radiological criteria, they were not diagnosed as sclerosing mesenteritis. More importantly, we have noticed that most of these patients had significantly increased abdominal subcutaneous adipose tissue as a marker of central obesity, and on investigation of patient demographic characteristics, we noted that most of them had high body mass index (BMI).

In recent years, it has been well established that obesity is associated with low-grade chronic inflammatory processes characterised by increased levels of circulating inflammatory cytokines, acute phase proteins, as well as adipokines or neuropeptides, in healthy obese subjects [9–12]. All these molecules are produced within adipocytes and also within macrophages and lymphocytes that infiltrate the mesenteric fat [9]. In addition, the inflammatory mediators found in adipose tissue, termed “adipokines,” have been shown to be overexpressed in the mesenteric adipose tissue of subjects with inflammatory bowel disease [13–17].

In the current study, we aimed to assess first the prevalence of idiopathic misty mesentery appearance in CT and second its possible relationship to obesity under the hypothesis that the microinflammatory process triggered by obesity may lead to mesenteric inflammation and consequently misty mesentery on CT. A review of the literature was also undertaken to evaluate the already known causes of misty mesentery and also the link between obesity and inflammation. To the best of our knowledge, this is the first study highlighting the prevalence of idiopathic misty mesentery and the possible link between obesity and this CT finding.

Materials and Methods

The study protocol was approved by the local Ethical Committee of a Training and Research Hospital. The CT features and medical records of 561 patients in whom misty mesentery appearance was depicted on abdominopelvic CT scans were prospectively collected by an experienced radiologist (N.O.) during the 2-year period from January 2011 to January 2013. Among these, 80 patients having segmental misty mesentery that presented as an incidental finding were included in the present study. The cause of the mesenteric changes in all these patients was unknown, and none of them had any disease that would be known to cause misty mesentery appearance on CT. Also, there were no changes in the misty mesentery appearance and no additional findings were observed during a minimum 1-year period.

CT was performed using either an 80-row detector CT (160-slice) scanner (Aquilion Prime, Toshiba Medical Systems, Nasu, Japan) or a 6-slice CT scanner (Brilliance 6; Philips Medical Systems, Amsterdam, the Netherlands). The technique of CT imaging was not standardized because of the variety of different clinical indications. However, to be included in the study, the section thickness had to be a maximum of 5 mm. Twenty-one of the patients underwent nonenhanced CT scans (“renal stone” protocol), while the rest of the study population received a diluted lactulose solution of 1000–1500 cc orally and intravenous iodinated nonionic contrast material. Diluted lactulose solution was given in a 1-1.5-hour time period before CT scanning. Intravenous contrast material was administered as a 100 mL bolus infusion at an injection rate of 2-3 mL/second.

The analysis population of the present study was patients with idiopathic segmental mild misty mesentery appearance on their CT images. CT criteria for the diagnosis of misty mesentery were as follows: normal mesenteric fat is about

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