

Computed Tomography / Tomodensitométrie

# Clinical and Endoscopic Significance of Bowel-Wall Thickening Reported on Abdominal Computed Tomographies in Symptomatic Patients With No History of Gastrointestinal Disease

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## Abstract

**Background:** Bowel-wall thickening (BWT) is a commonly reported finding on diagnostic abdominal pelvic computed tomographies (CT) in patients with no history of gastroenterologic disease. The significance of this nonspecific finding is not clear.

**Methods:** Medical records from the Vancouver General Hospital were reviewed from October 27, 1999, to October 27, 2009. The initial search yielded 5696 cases, of which 76 cases met the inclusion criteria for review. Inclusion criteria were the following: age older than 18 years, symptoms without a diagnosis of gastrointestinal disease before CT, the reported finding of terminal ileal and/or colonic BWT, colonoscopy after CT, and/or microbiologic investigations. Exclusion criteria included known gastrointestinal disease before CT. The primary objective was to determine if BWT could be associated with a significant endoscopic pathology. The secondary objective was to determine whether the pattern of abnormality on the CT was associated with a specific endoscopic finding.

**Results:** A total of 76 patients met the inclusion criteria of our study. Of those, 76% had various identifiable pathologies on colonoscopy. Only 24% had normal colonoscopic findings. Inflammatory bowel disease (IBD) and infectious colitis were the most common causes of BWT. A report of “skip lesions” on the CT (5%) was always associated with IBD. “Pancolitis” reported on the CT (11%) was associated with endoscopic findings of IBD in 25% of cases, infection in 50% of cases, and normal findings in 25% of cases. The report of “stranding” (36%) on CT in the presence of BWT was associated with many non-neoplastic endoscopic pathologic processes, including infectious colitis (22%), IBD (19%), and ischemia (15%), but also was associated with normal endoscopic findings in 26% of the cases. “Lymphadenopathy” was reported in 17% of the CTs and was associated with infectious colitis (30%), IBD (38%), or neoplastic processes (15%) but also normal endoscopic findings in 15%.

**Conclusion:** Symptomatic patients who are found to have nonspecific BWT on CT should undergo definitive endoscopic investigation because the majority will have significant gastroenterologic disease, and only a minority will have a normal colonoscopy.

## Résumé

**Contexte :** L'épaississement de la paroi intestinale est couramment observé à la tomodensitométrie (TDM) pelvienne chez des patients sans antécédents de maladies gastro-intestinales. La signification de cet aspect non spécifique n'est toutefois pas claire.

**Méthodes :** L'étude a porté sur les dossiers médicaux du Vancouver General Hospital du 27 octobre 1999 au 27 octobre 2009. La recherche initiale a permis de relever 5 696 cas, dont 76 satisfaisaient aux critères d'inclusion de la présente étude. Les critères d'inclusion suivants ont été établis : patients âgés de plus de 18 ans, présence de symptômes sans diagnostic de maladie gastro-intestinale avant la TDM, observation signalée d'un épaississement de la paroi de l'iléon terminal ou du colon, colonoscopie pratiquée après la TDM, et/ou analyses microbiologiques. Les critères d'exclusion consistaient en un diagnostic de maladie gastro-intestinale confirmé avant la TDM. L'objectif premier consistait à déterminer si l'épaississement de la paroi intestinale pouvait être associé à une pathologie significative observée lors de l'endoscopie. L'objectif secondaire consistait à déterminer si les types d'anomalies observées par TDM étaient associés à des signes endoscopiques particuliers.

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**Résultats :** En tout, 76 patients satisfaisaient aux critères d'inclusion de l'étude. La colonoscopie a mené à l'identification de pathologies diverses chez 76 % d'entre eux. Les résultats de la colonoscopie étaient normaux chez seulement 24 % d'entre eux. Les maladies inflammatoires de l'intestin et les colites infectieuses étaient les causes les plus fréquentes d'épaississement de la paroi intestinale. Une atteinte discontinue observée à la TDM (5 %) était toujours associée à une maladie inflammatoire de l'intestin. Une pancolite signalée à la TDM (11 %) était associée à la découverte endoscopique d'une maladie inflammatoire de l'intestin dans 25 % des cas, d'une infection dans 50 % des cas, et à des résultats normaux dans 25 % des cas. Une infiltration de la graisse observée à la TDM (36 %) en présence d'un épaississement de la paroi intestinale était associée à de nombreux processus pathologiques non néoplasiques observés à l'endoscopie, notamment les colites infectieuses (22 % des cas), les maladies inflammatoires de l'intestin (19 %) et l'ischémie (15 %), mais était également associée à des résultats endoscopiques normaux dans 26 % des cas. Les adénopathies, signalées dans 17 % des TDM, étaient associées aux colites infectieuses (30 % des cas), aux maladies inflammatoires de l'intestin (38 %) ou à des processus néoplasiques (15 %), mais également à des signes endoscopiques normaux dans 15 % des cas.

**Conclusion :** Les patients symptomatiques qui présentent un épaississement de la paroi intestinale non spécifique à la TDM doivent subir une évaluation endoscopique, puisque la majorité d'entre eux présentent une maladie gastro-intestinale importante et que la colonoscopie se révèle normale chez une minorité seulement.

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*Key Words:* Colonoscopy; Bowel-wall thickening; Abdominal computed tomography

Computed tomography (CT) is widely available and increasingly used to evaluate patients who present to the emergency department with abdominal pain of uncertain etiology [1]. Bowel-wall thickening (BWT) is a relatively common finding on abdominal-pelvic CT, especially in patients who present with abdominal pain. CT criteria used to assess a thickened colonic wall include the following: degree of thickening, pattern of attenuation, symmetry, focal or diffuse involvement, and associated extraluminal abnormalities, such as adjacent fat stranding or lymphadenopathy [2,3]. At our institution, findings of BWT on CT are a frequent reason for gastroenterologic consultation and request for endoscopic evaluation. As a result, BWT often leads to colonoscopy, which exposes patients to quantifiable risks and also impacts health care resources. Furthermore, the clinical significance of BWT has not been clearly established, and such findings are not currently considered to be an indication for colonoscopy by the American Society of Gastrointestinal Endoscopy. In Canada, no specific guidelines exist for the colonoscopic evaluation of patients with colonic-wall thickening found on CT. Previous reports that evaluated the clinical relevance of colonic thickening reported on CT have been limited by small patient numbers and heterogeneous patient populations [1,4–6]. Most of these studies evaluated BWT as an incidental finding on CT and did not assess symptomatic patients.

BWT has been reported to mainly reflect inflammatory bowel disease (IBD), bowel ischemia, or colorectal carcinoma [7–9]. However, the normal thickness of the colonic wall can vary significantly, depending on the degree of bowel distension. With the colon distended, the wall should be less than 3-mm thick. BWT may be erroneously reported as abnormal on CT in the setting of bowel collapse or partial distension. Also, due to fluid, fecal contents, or redundant colon, BWT can be difficult to determine. Some researchers have used a measurement of 2-3 mm as the upper limit of normal bowel-wall thickness [10,11], whereas others have suggested the presence of any perceptible thickening as abnormal [12].

To our knowledge, there has only been 1 large study in the recent literature that addresses the management and clinical impact of BWT found on CT [13]. Our study aims to look at the significance of BWT and commonly associated radiologic findings of perienteric and/or colonic stranding and lymphadenopathy in patients without any history of gastrointestinal disease in the large bowel and terminal ileum compared with colonoscopic findings. The aim is to guide physicians on how to evaluate patients with a CT finding of BWT and to determine whether colonoscopy is indicated.

## Materials and Methods

A retrospective chart review was performed to derive data from radiologic, endoscopic, and pathologic reports by using electronic medical records at the Vancouver General Hospital, a tertiary care center in Vancouver, Canada. Medical records were reviewed for the time period October 27, 1999, to October 27, 2009. Key words entered into the electronic data record search included “bowel wall thickening” and “CT abdomen.” No strict definition of BWT exists in the literature and thus the description was based on the radiologist's interpretation on the CT report. Our initial search yielded 5696 patients, of whom 76 patients met the criteria for study entry. The patients included in our retrospective study were older than 18 years of age, had symptoms without a diagnosis of gastrointestinal disease before the abdominal CT, were reported to have radiologic terminal ileum or large-bowel-wall thickening, and underwent colonoscopy with biopsies, and/or microbiologic investigations. Exclusion criteria included patients with known gastrointestinal disease undergoing CT, where BWT could be explained by a known colorectal cancer, IBD (ulcerative colitis or Crohn disease), diverticulitis, ascites, and cirrhosis (eg, CT for disease staging, follow-up). Demographic data included age, sex, and the presence of abdominal symptoms. Colonoscopies were performed by the hospital's on-call gastroenterology staff. The CTs were interpreted by the hospital's radiology staff. All the patients were scanned on

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