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Case Report

Three-dimensional computed tomography rendering of pedunculated colon polyp: new “clapper-bell” sign pedunculated polyp at 3D computed tomography

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ABSTRACT

The incidental detection of a tubulovillous adenoma at a contrast-enhanced computed tomography (CECT) with nondedicated protocol, performed in emergency conditions, is an uncommon finding. We report a case of a woman presenting with a subocclusive episode. A CECT scan was performed, and a pedunculated polyp could be appreciated at 3D-reconstruction images. A particular depiction of pedunculus of the polypoid lesion, resemble a clapper-bell, could help to define the vegetating lesion at the volume-rendering reconstruction images. This case emphasizes the fundamental role of postprocessing in the clinical practice to improve the diagnostic accuracy of abdominal CT scan. In addition, a potential new radiologic sign, the “clapper-bell sign”, is proposed, as literature about the appearance of a polyp at CECT, performed without a dedicated protocol for colonoscopy, is poor.

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Introduction

Colorectal cancer (CRC) is a common malignancy that results in significant morbidity and mortality. It is widely demonstrated that it arises from a premalignant lesion, adenoma, after a series of specific genetic transformations. Consequently, early detection and eventual removal of that lesions results in a reduction in incidence

of CRC. The role of colonoscopy in identifying colonic premalignant lesions is largely documented. Over the last decades has also emerged the role of computed tomography (CT) with the application of specific protocols as a potential screening technique. CT scan without dedicated protocols is not accurate enough for this aim. Therefore, there are not recent systematic studies describing specific characteristics of adenomas at CT images but only few

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case reports. We present a case of a tubulovillous adenoma of the descending colon depicted at a CT scan performed in emergency conditions and therefore without adequate colon preparation. It was possible to suggest a diagnosis thanks to volume-rendering (VR) reconstruction images, which to date are essential in the clinical practice. In addition, it is proposed a new “clapper-bell” sign, referring to the particular shape of polyps with long stalks, as the one that we detected, which could help in recognizing this kind of lesions.

Case report

A 50-year-old woman referred to our emergency department with a clinical picture of subocclusive episode and complaining of recurrent abdominal pain over the last 6 months. No significant finding was observed at first-line ultrasonography. A contrast-enhanced CT (CECT) was then performed to assess the presence of a mechanic obstructing ileus and to investigate the cause of it. Tomographic images showed pathologic distension of small bowel and colon loops up to the descending part, where it was noticed a wide-vegetating soft-tissue mass narrowing the lumen. After intravenous (IV) administration of iodinated-contrast material, the lesion showed dishomogeneous but strong enhancement, particularly at the level of a central axis measuring about 6.5 cm in length (Fig. 1). At VR reconstructions (Fig. 2), maximum intensity projections and multiplanar reconstructions images, it was possible to demonstrate the presence of a polypoid



Fig. 2 – CT VR reconstruction of polypoid lesion (A, with colonic wall and B, without colonic wall) shows a large “head” (arrow) and a long stalk (arrowhead) like a clapper-bell.



Fig. 1 – (A, B, C) Axial (A, B) and coronal (C) CT images, portal phase, reveal a vegetating solid mass lesion arising from the colonic wall and protruding into the lumen at the level of descending colon, which results in narrowing (arrowhead). The huge lesion shows rich enhancement of the central stalk (arrow).

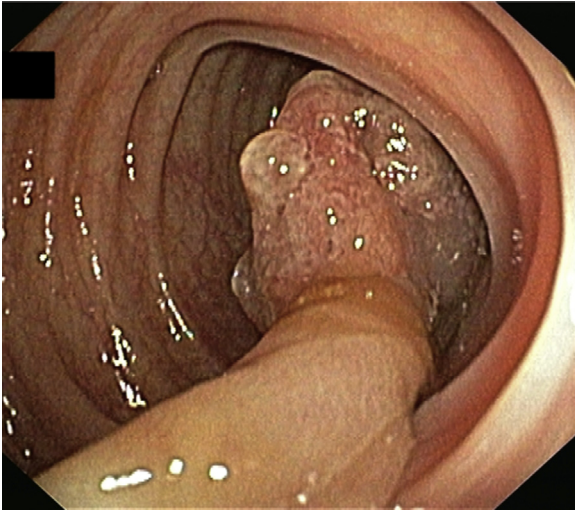


Fig. 3 – Endoscopy reveals the presence of a wide pedunculated polyp with a long stalk in the descending colon.

lesion with long and richly vascularized pedunculus, likely responsible for the subocclusive episodes that the patient experienced. Remaining colonic walls and perivisceral fat had normal appearance. After that, an endoscopy was performed confirming the presence of that only vegetating process in the descending colon, which was safely removed (Fig. 3). At histopathology that tissue resulted to be a tubulovillous adenoma with disease-free margins. At 5-month follow-up, the patient did not report any further subocclusive symptom.

Discussion

CRC is the third most common cancer and second leading cause of cancer mortality in the United States, being responsible for approximately 55,000 deaths per year [1]. It is largely demonstrated that most CRC arise from adenoma, a premalignant condition, which is thought to undergo a series of specific genetic perturbations over several years [2]. Therefore, detection and removal of adenomas has been shown to significantly decrease the incidence of CRC [3]. Having said that, not all adenomas are expected to become carcinoma. Morphologically, adenomas can appear sessile, flat, or pedunculated. Most of advanced adenomas have tubulovillous histologic characteristics, which tend to demonstrate higher degrees of dysplasia [4]. Several studies demonstrate that size (>10 mm) and villous component (>25%) of polyps are independent factors of the risk of malignancy, and therefore indicators for the removal [5,6]. Endoscopy is widely recognized as the gold standard for detection of colonic adenomas, although numerous recent studies are focusing on CT colonoscopy as an efficient alternative to more invasive methods [5,7–9].

Conversely, literature regarding the characteristics of colonic adenomas at CECT is poor and, to date, only few cases

of polyps detected with this technique are described with appearances defined as aspecific at traditional protocol of CECT [10]. Villous subtype often appears as a mass with attenuation equal to that of soft tissue at unenhanced CT with convoluted and quite peculiar gyral pattern after IV contrast enhancement, which Chung et al. [11] described at magnetic resonance imaging as mimicking the appearance of cerebral hemisphere. In the case presented previously, a characteristic feature is depicted of what was histologically proved to be a tubulovillous polypoid lesion. A fibrovascular stalk is typical of a pedunculated lesion, and it is expected to show strong enhancement after IV contrast administration. The enhancement behavior of polyps is not fully documented in the literature, as only few study designs include evaluation of lesions at CT colonoscopy after IV contrast administration [12,13].

In our case, the identification of a vegetating soft-tissue mass with marked enhancement was suspicious for polypoid lesion, particularly at assessment of coronal reconstructions, where a tubular-shaped lesion could be appreciated. Furthermore, 3-dimensional rendering techniques were applied, and an image resembling a clapper-bell helped to define the presence of a fibrovascular structure underlying an adenoma and to suggest the diagnosis of pedunculated polyp. This “clapper-bell sign” imaged at VR reconstructions, underline the value of this flexible and accurate 3D-imaging technique useful to obtain anatomic and morphologic information, often indispensable in the routine practice of abdominal CT imaging to improve its diagnostic accuracy [14]. Colonic endoscopy and/or colonoscopy CT are unquestionable accurate instrumental studies for CRC screening. However, in emergency situations, particularly for subocclusive or occlusive conditions, when a CECT is performed with a nondedicated protocol, VR, MPR reconstructions can help to recognize incidental findings like the one that we described. The identification of a “clapper-bell sign” at 3D rendering can lead to the correct diagnosis of a pedunculated giant polyp, referring to its fibrovascular stalk in particular, which needs to be further investigated and eventually removed with colonoscopy.

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