COLONIC lesions WITH A FAST GROWTH detected by CT colonography: a PICTORIAL ESSAY

Poster No.: C-1586
Congress: ECR 2015
Type: Educational Exhibit
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Keywords: Cancer, Colonography CT, CAD, Colon
DOI: 10.1594/ecr2015/C-1586

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Learning objectives

Conventional Colonoscopy (CC) is the universally accepted gold standard technique for the diagnosis of colonic polyps and cancer, but CT-Colonography (CTC) is also a highly sensitive technique, especially when tagging agent is used and when both colon preparation and distension are optimal.
Background

The majority of all colorectal cancers (CRC) develop following the adenoma-carcinoma sequence, but the pathogenesis of the remaining one-third is not completely understood.

We report some cases of patients with small lesions which increased significantly in size at a follow-up performed with CT colonography (CTC) within one/two years.
Findings and procedure details

In this Pictorial Essay we describe some cases of colonic polyps and cancers with atypical pathway, identified at CTC follow-up.

In all cases CTCs were performed after a preparation with fecal tagging, obtained with Gastrografin, and mild cathartic preparation associated with low-fiber diet two days before. Colonic distension was obtained by insufflating 3 or more L of CO2 with an automatic insufflator following intramuscular injection of hyoscine-butyl-bromide when possible. Intravenous contrast was not used. A primary 2D visualization followed by 3D view for problem solving was adopted. CAD was also used as a second reader.

All colonic lesions showed a fast growth at follow-up performed by CTC within 1-2 years.

Three patients underwent surgery and at pathological examination carcinomas were found; no microsatellite instability (MSI) was found, but in two of them a BRAF mutation and a p53 mutation were respectively demonstrated.

Two patients underwent polypectomy and pathological analysis found an adenoma with low grade dysplasia, an adenoma with medium grade dysplasia and a serrated adenoma, with no genetic mutations.

Case 1

A CTC performed on an asymptomatic 74 years old woman showed a 5 mm polyp in the medium portion of sigmoid colon [Fig. 1 on page 7, Fig. 2 on page 7]. During a follow-up CTC performed after 2 years a neoplastic stricture was found in the same portion of sigmoid colon where the small polyp had been previously described [Fig. 3 on page 8, Fig. 4 on page 9]. An endoscopy performed the same day confirmed a 3 cm flat lesion with central depression in the medium portion of sigmoid colon [Fig. 5 on page 10]. The patient underwent left laparoscopic hemicolectomy and pathological examination described a centrally depressed lesion with a TNM classification of pT3, pN1c and lymphatic and vascular invasion. The mutational analysis showed mutation of BRAF.

Case 2

A 75 year old man with history of chronic obstructive pulmonary disease, hypertension, prostate and sigmoid cancer, the latter treated with resection followed by a J 'pouch' anastomosis not allowing an easy approach with CC; for this reason the patient underwent annual CTC. The follow-up CTC found a slightly elevated non-polypoid lesion (flat) with a central depression in a fold of the ascending colon close to the hepatic flexure, measuring 13 mm in diameter and 7 mm in height [Fig. 6 on page 11, Fig. 7 on
A CC was recommended to remove the lesion, but given the difficulties of performing CC the clinician decided to perform a follow-up CTC after 1 year. During the last CTC a neoplastic stricture was found in the ascending colon, in the corresponding area where the flat lesion had been described [Fig. 8 on page 13, Fig. 9 on page 14], associated with some slightly enlarged lymph-nodes. The patient underwent total colectomy with ileo-rectal anastomosis (termino-terminal). The pathologist reported an ulcerated adenocarcinoma of the ascending colon with a mild differentiation, with invasion up to the serosa, initial infiltration of the peri-colonic tissues and p53 mutation.

Case 3

A patient with negative family history for CRC and a previous resection of an advanced adenoma with medium grade of dysplasia in the descending colon, followed-up with annual CC or CTC. No positive findings were observed during 8 years follow-up [Fig. 10 on page 15].

A follow-up CTC performed 1 year after the last examination discovered two sessile lesions measuring 9 mm and 7 mm and a 15 mm polypoid lesion in the sigma [Fig. 11 on page 16, Fig. 12 on page 17, Fig. 13 on page 18]. A CC confirmed the findings and the pathological analysis revealed two adenomas with low grade dysplasia for the former ones and an adenoma with medium grade dysplasia for the latter one. No genetic mutations were found.

Case 4

A 68 years old woman with negative family history for bowel inflammatory diseases or tumors, with a previous resection of adenomatous polyps (2005) and suffering from chronic constipation. The patient underwent annual follow-up with CC until 2007, when a fracture of the splenic capsule occurred during the examination, leading to hemoperitoneum. For this reason follow-up with CTC was recommended. In 2012 a CTC evidenced a 5 mm polyp of the descending colon [Fig. 14 on page 19]. A follow-up CTC performed after 18 months showed the polyp doubling its size from 5 to 10 mm [Fig. 15 on page 20, Fig. 16 on page 21]. A CC with polypectomy was recommended. The pathological examination revealed a serrated tubular adenoma with low grade dysplasia.

Case 5

A patient at medium risk for CRC underwent a CTC for abdominal pain of unknown origin. A 15 mm non-polypoid lesion was found in the cecum [Fig. 17 on page 22], but the presence of dolichocolon and coagulation alterations led to follow-up the lesion instead of resecting it. A CTC repeated after one year showed a 32 mm flat lesion in the same position [Fig. 18 on page 23, Fig. 19 on page 24]. Pathological examination after surgery evidenced a carcinoma with T2 N0 stage. No genetic alterations were detected.
Fig. 1: 2D visualization of the 5 mm polyp in the medium portion of sigmoid colon.

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**Fig. 2:** 3D reconstruction of the same 5 mm polyp described in Fig. 1. CAD correctly identified it.

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**Fig. 3:** A follow-up CTC performed after 2 years showed a neoplastic stricture in the same portion of sigmoid colon where the polyp had been previously described. 2D visualization.

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**Fig. 4:** 3D visualization of the lesion described in Fig. 3.

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Fig. 5: Endoscopic view of the same lesion of Figures 3 and 4.

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Fig. 6: 2D visualization of a flat lesion in a fold of the ascending colon close to the hepatic flexure.

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**Fig. 7:** 3D view of the same non-polypoid lesion described in Fig.6.

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**Fig. 8:** 2D visualization of the neoplastic stricture found in the ascending colon.

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**Fig. 9:** 3D visualization of the anular lesion showed in Fig. 8. CAD correctly identified it.

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Fig. 10: A 2D view of a portion of the sigma with no lesions.

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**Fig. 11:** A 2D view of two sessile lesions measuring 9 mm and 7 mm in the sigma.

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Fig. 12: 2D visualization of a 15 mm polypoid lesion in the sigma.

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Fig. 13: 3D view of the three lesion showed in figures 11 and 12.

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Fig. 14: 2D visualization in a prone CT scan of a 5 mm sessile polyp of the descending colon.

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**Fig. 15:** 2D visualization in the prone CT scan of a 10 mm sessile polyp in the descending colon, in the same position of the lesion in Fig. 14.

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**Fig. 16:** 3D visualization of the same sessile polyp of the descending colon described in Fig. 15.

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Fig. 17: 2D coronal view of a 15 mm flat lesion.

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Fig. 18: 2D coronal visualization of a 32 mm flat lesion in the same position of the one described in Fig. 17.

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Fig. 19: 3D view of the same lesion in Fig. 18.

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Conclusion

CTC correctly visualized all the colonic lesions (cancers and polyps) at follow-up. In particular it was a reliable technique for patients who could not underwent CC for difficult colon anatomy or co-morbidities.

Our experience showed that there are some colorectal cancers which do not follow the adenoma-carcinoma sequence but have a fast growth and so they cannot be probably identified by screening programs.
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References


