



VIRTUAL COLONOSCOPY

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WHAT IS IT ?

Virtual Colonoscopy (VC) is a non-invasive imaging method, first described in 1994 and well established use in clinical practice, allowing studying the colon wall through the use of a computerized axial tomography (TAC), simulating the endoscopic examination. The conduct of the exam is easier, faster, and less invasive than the colonoscopy and endoscopy requires no anesthesia or sedation. In practice, this is an endoscopic procedure to conduct computer using CT images.

WHAT IS IT FOR?

VC, using the more advanced methodology, is as accurate as conventional colonoscopy for the detection of clinically important colorectal polyps (>6 mm) in asymptomatic, average-risk adults. If a polyp is found, the patient will be referred to a Gastroenterologist for an optical or a traditional colonoscopy, which should allow confirmation of symptoms, removal of the polyp with relative biopsies. The main indication regards the need to complete examination of the large bowel examination when colonoscopy results inadequate for the detection of post-surgical adhesions, and anatomic abnormalities such as dolichocolon and limited tolerance at gas distension with or without vagal response. In elderly patients or patients with comorbidities, traditional endoscopy may account for an increased risk of complications such as bowel perforation. VC can be used to examine the proximal colon when an obstructing left-sided cancer or structuring diverticulitis prevents passage of a colonoscopy, thus the exam allows detecting synchronous cancers o lesions. Up to the present day, on the other hand, to detect sub-occlusive conditions when colonoscopy cannot be performed, a TC with means of contrast (either through intravenous infusion or in hydro soluble form in the rectum) has been used. (Colo-TC).Furthermore, VC is useful to define both the proper topographic location of lesions and the extra colonic extent of cancers, providing information about preoperative staging. Finally, if the employment of VC as a method of colon-rectal cancer screening is still in progress, the future addition of virtual colonoscopy to the guidelines' menus of screening options appears certain and should help improve overall screening compliance and favorably impact colorectal cancer control.

HOW IS IT PERFORMED?

A proper mechanical bowel preparation is required for a correct performance. The patient is required to take laxatives 24 hours before, in order to cleanse the bowels.

The day of the exam, the patient is asked to drink a solution of mdc-water-soluble iodinated organ to mark any debris present in the intestinal lumen ("fecal tagging") and after about 2 hours patient is positioned on the couch of the CT. Through insertion of a small rectal catheter (the Foley type), the patient's colon is inflated with 1500 ml of air or carbon dioxide (better tolerated by the patient and absorbed in less time), in order to unfold the bowel and to seek wall irregularities.

At this point, a scan is performed in the prone position and then in the supine onewithout intravenous administration of contrast (used only if you need a cancer staging) to obtain a fluid redistribution slopes venues and mobilization of fecal residue solids.



The CT scan lasts for a few seconds and ionizing radiation patient are considerably lower than for a CT scan of the abdomen and standard relative to a double-contrast barium enema, because it uses low-dose protocols. The data are processed by a specific "software" that allows us to reconstruct the entire lumen of the colon and "virtually" browse inside.

The polyps may appear as simple swellings of the mucous membrane, with regular outlines or be characterized by the presence of a peduncles; more difficult to recognize are on the other hand flat polyps.

WHAT ARE THE LIMITS AND UNRESOLVED ISSUES?

The most important issue is related to the fact that VC, unlike colonoscopy, endoscopic does not allow to remove polyps and formations to obtain biopsies

The VC has a great sensitivity for polyps of size equal to or greater than cm (up to 94%) which however decreases with decreasing dimensions (up to 88% for polyps of at least 6 mm diameter) very difficult to recognize with the VC flat lesions are ("flat lesion").

It is important to underline the fact that VC should not be considered as a replacement of traditional colonoscopy but an integrated examination. The main issue now regards a good sensitivity (up to 94%) of virtual colonoscopy for polyps at least 1 cm in diameter but for smaller polyps percentages decrease in ratio to diameter (up to 88% for polyps at least 6 mm. in diameter). Furthermore, VC demonstrates a low sensibility for flat polyps.

The VC is an expensive method as conventional colonoscopy. In the United States, current expenses required for the survey are similar to those of abdominal CT. However, in the case that the designation to VC is screening, additional conventional colonoscopies should be necessary in 10-20% of cases.

However, if the indication for an examination is screening, additional colonoscopies will be needed in at least 10%-20% of patients to assess findings or resect polyps.

In these cases, a more cost-effective approach must be adopted with colonoscopy that is both diagnostic and therapeutic, in order to excise lesions in a single sitting with a single bowel preparation.

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