

Virtual Colonoscopy Could Become Widespread

Most of the obstacles to using this noninvasive screening technique have been addressed.

BY KERRI WACHTER
Senior Writer

WASHINGTON — Improvements in technology and technique are helping to overcome some of the limitations of CT colonography, and this may ultimately lead to its widespread use in screening for colorectal cancer, Dr. Jay P. Heiken said at the International Union Against Cancer Conference.

CT colonography—also known as virtual colonoscopy—allows physicians to look for abnormalities in the colon wall using either the standard 2-D format or a 3-D approach. The 3-D view allows the physician to see the colon in much the same way that an endoscopist would—navigating the colon forward or backward, said Dr. Heiken, a professor of radiology at the Mallinckrodt Institute of Radiology at Washington University, St. Louis.

The advantages of this technique over optical colonoscopy include:

- ▶ A noninvasive technique that requires no sedation.
- ▶ Rapid image acquisition.
- ▶ Accurate localization of lesions.
- ▶ The elimination of blind spots.
- ▶ Extracolonic findings.

The technique is not without disadvantages, however. The first problem is the radiation dose. “I think this really is not a significant problem,” Dr. Heiken said. Several studies have shown that CT colonography can be performed with a radiation dose substantially lower than that of an air-contrast barium enema.

With virtual colonoscopy, it can be difficult to distinguish polyps from residual stool. Stool tagging can be used to overcome this obstacle. Small amounts of barium are administered orally the day before the examination. The barium is in-

gested during the bowel cleansing process and is incorporated into any residual stool in the colon, allowing that stool to be clearly differentiated from a polyp on a 2-D image.

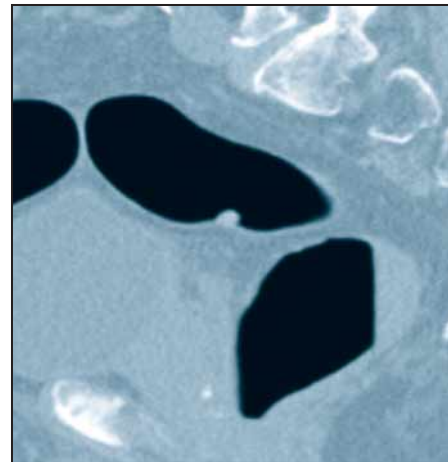
A similar technique can be used to help distinguish polyps from residual fluid, which many bowel preparations can leave behind. Fluid tagging involves administering a small amount of oral iodine the night before the examination. Residual fluid then appears high in density on a 2-D image.

The landmark study for virtual colonoscopy involved 1,233 asymptomatic adults who underwent virtual and optical scans on the same day (N. Engl. J. Med. 2003; 349:2191-200). The researchers concluded that virtual colonoscopy was comparable to optical colonoscopy for the detection of clinically relevant polyps.

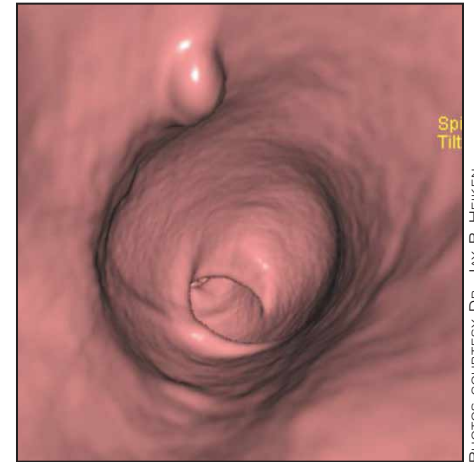
Two subsequent studies found much lower sensitivities for CT colonography, at about 50% (JAMA 2004;291:1713-9; Lancet 2005;365:305-11). Neither of the studies involved screening populations, and both used somewhat outdated techniques and 2-D images. “We’re now using multidetector scanners that have 4, 16, or 64 detector rows,” Dr. Heiken said. “Our spatial resolution is much greater, so we can identify much smaller polyps.”

Moreover, readers involved in the JAMA study were not trained in reading virtual colonoscopy images. All of these aspects help to account for the low sensitivities.

Importantly, results should be available in 2007 from the U.S. CT Colonography Screening Trial involving virtual and optical colonoscopy of 2,600 asymptomatic adults with average risk for colon cancer. None of the 15 participating institutions has used less than 16-row CT, and most have been using 64-row CT. In addition,



This sagittal image of a rectosigmoid polyp was made with a 16-row scanner.



The same polyp is displayed in an endoluminal view by using a 3-D format.

PHOTOS COURTESY DR. JAY P. HEIKEN

stool and fluid tagging is being used, and all readers have been trained. The trial is organized by the American College of Radiology Imaging Network and is funded by the National Cancer Institute.

While most of the obstacles to the widespread use of virtual colonoscopy as a screening tool appear to have been addressed, capacity—particularly adequate reader training—remains an issue. “It takes at least 50-100 examinations to begin to develop the expertise necessary to read these [images] properly and accurately,” Dr. Heiken said. Reader training would have to be ramped up to meet the goal of widespread use.

Perhaps the most important issue is the lack of third-party payment for colorectal screening using CT colonography in the United States.

Still, some innovations on the horizon may hasten the routine use of virtual colonoscopy. The “file” view opens the colon up electronically to allow it to be viewed like a pathology specimen. “The advantage of that is that it makes it less likely that we’ll miss things ... around bends,” Dr. Heiken said.

Computer-aided diagnosis also may soon play a part in virtual colonoscopy.

Software improvements could help identify potential polyps missed on visual inspection. The final determination would still be made by the physician. “It will be very important for helping us improve our detection rate, decrease interobserver variability, and ... make our examination more efficient,” he said.

Virtual colonoscopy examinations involving minimal bowel preparation might even be possible soon. “One of the big obstacles to colorectal cancer screening is that most patients do not want to have to undergo a rigorous, cathartic bowel preparation,” Dr. Heiken said. Consequently, many patients who should be screened forgo this exam. Some studies have shown that it is feasible to perform CT colonography with stool and fluid tagging but without cathartic preparation and get good results.

Greater patient discomfort associated with colon inflation during virtual colonoscopy is another potential limitation. However, discomfort most often arises from the use of room air to insufflate the colon, Dr. Heiken noted. The use of CO₂ is more comfortable for the patient and the gas is more quickly reabsorbed by the body. ■

Mortality Equal in Laparoscopic, Open Colorectal Ca Surgery

BY TIMOTHY F. KIRN
Sacramento Bureau

SEATTLE — Patients who undergo a laparoscopic procedure for colon or rectal cancer have no worse mortality beyond 5 years than those who have an open procedure, according to a prospective, randomized trial presented at the annual meeting of the American Society of Colon and Rectal Surgeons.

“We found no unusual recurrences after a median follow-up of over 7 years, and there were no wound recurrences in our laparoscopy group,” Dr. Daniel P. Geisler said in reference to the follow-up results of his 110-patient trial at the Cleveland Clinic.

No previous prospective studies of laparoscopy and colon cancer have reported postsurgical results beyond 3 years, said Dr. Geisler of the colorectal surgery department at the Cleveland Clinic. His study, with a median follow-up of 7.5 years, found overall survival rates of 82%

for the 55 patients whose cancer was removed laparoscopically, and 67% for the 55 patients who underwent a conventional procedure—a difference that was not statistically significant, Dr. Geisler said.

Cancer-related survival by cancer stage was 82% for stage I (92% for laparoscopy vs. 86% for conventional), 83% for stage II (93% laparoscopy vs. 73% for conventional), 69% for stage III (67% laparoscopy vs. 70% conventional), and 0% for stage IV.

The patients in the trial were undergoing curative resective procedures for cancer or polyps of the right colon, sigmoid colon, or upper or lower rectum. Patients who turned out to have benign disease after surgery (15 patients in each randomized group) were ex-

cluded from further follow-up.

There was no difference between groups in age, gender, or overall health. They had similar distribution by postoperative staging, similar numbers of nodes removed (an average of 21 for laparoscopy versus 25 for conventional), and equivalent resection margins.

Given the short-term benefits, the trial data suggest that laparoscopy is the preferred approach.

DR. GEISLER

undergoing the open procedure).

The laparoscopic patients also needed less analgesia after the procedure than the open group (an average of 0.8 mg/kg of morphine equivalent on the first postoperative day vs. 1 mg/kg, with no difference

on subsequent days). The laparoscopic group had a more rapid return to normal pulmonary function (a return to 80% of their preoperative function at an average of 3 days vs. 6 days for the open surgery patients).

A total of 11% of the laparoscopic procedures were converted to open procedures. But the postoperative complication rate was the same for both groups (15%). There was one death in each group within 30 days. One wound recurred, in a patient who had a conventional procedure.

Given the short-term benefits, the trial suggests laparoscopy is the preferred approach, Dr. Geisler said.

Asked to compare the laparoscopic procedures with an open procedure with an epidural, Dr. Geisler said that an epidural provides better pain coverage during open procedures, but he would still favor a laparoscopic procedure because no epidural is needed, so the immediate postoperative recovery is much shorter. ■

