An update on virtual colonoscopy (CT colonography)

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Virtual colonoscopy performed with computed tomography is a quick noninvasive technique of imaging the large bowel that should soon be more widely available in Australia.

Remember

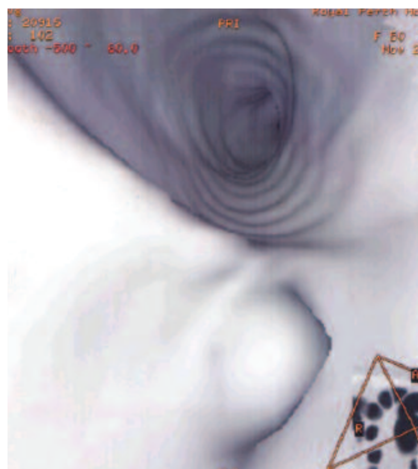
- Virtual colonoscopy (computed tomography colonography, or CTC) is a rapidly advancing technique that uses spiral CT to image the colon and rectum. In contrast to older generation CT scanning, which gave a series of axial slices, spiral CT obtains a 'volume' of information for interrogation.
- Two-dimensional cross-sectional images and computer software reconstructed three-dimensional 'fly-through' (virtual colonoscopy) images are obtained (Figures 1a and 1b). Image quality allows for the detection of elevated polyps, but not of finer mucosal detail such as vascular anomalies and colitis.
- Patients need to take bowel preparation as they would for conventional colonoscopy. The colon is distended with air by rectal catheter and CT imaging undertaken, during a single breath hold, in both prone and supine positions; this is to minimise false negative (that is, missed polyps) and false positive (for example, from faecaliths) findings. Sedation is not required.
- Sensitivity for detecting large polyps (1 cm and above diameter) in expert centres is similar to colonoscopy; the importance of this polyp size threshold relates to the significantly increased likelihood of current or future malignancy. Sensitivity for polyp detection decreases with decreasing polyp size.

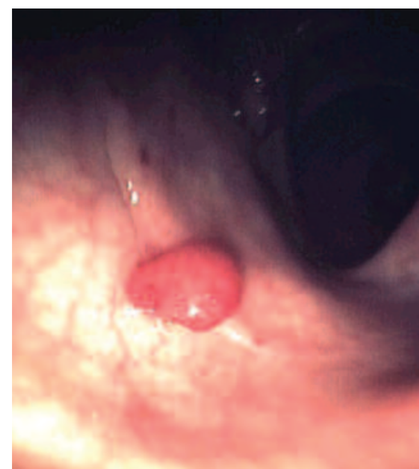
Assessment

- CTC is an alternative means of imaging the large bowel; in many centres it is replacing barium enema, which is less accurate for polyp detection and less well tolerated. While colonoscopy is the investigation of choice for many symptomatic patients, CTC currently has a role in the following situations:
  – incomplete colonoscopy, because of technical difficulties or a partially obstructing distal lesion
  – previous difficult colonoscopy
  – presence of a relative contra-indication to sedation.
- CTC is not widely available in Australia at present; it is anticipated that the current indications for reimbursement (incomplete colonoscopy within the preceding three months) will be widened in the near future. The accuracy of CTC is dependent on operator expertise, and when the procedure is more widely available appropriate professional standards should be in place.

Management

- As CTC is a diagnostic test, the finding of a polyp usually dictates that colonoscopy be undertaken. Whether detection of one or two small 'polyps' should lead to colonoscopy is unclear: first, the risk for progression to malig-nancy is small, especially in more





Figures 1a and b. Virtual colonoscopy image (a, left) and corresponding conventional colonoscopy image (b, right) of a mucosal polyp.

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elderly individuals; second, smaller ‘polyps’ at CTC may be false positive findings. Accordingly, management options to consider include immediate colonoscopy, future surveillance CTC or no further testing.

- Complications from CTC are extremely infrequent. As with colonoscopy, patients (especially the elderly) may find bowel preparation difficult.
- CTC delivers a significantly lower radiation dose than conventional abdominal CT imaging (about 5 mSv, compared with 10 mSv) or barium enema (about 8 mSv). The lifetime risk of fatal cancer induction from 5 mSv is about one in 5000, which compares with a lifetime risk of dying from colon cancer of about one in 50.
- As a result of the lower radiation dose, CTC is not able to evaluate accurately most extracolonic structures. Incidental extracolonic abnormalities, such as hepatic, ovarian or renal masses, are usually benign but typically require further evaluation by ultrasound or conventional CT.
- Colorectal neoplasia screening of asymptomatic and average-risk subjects can be undertaken by either faecal occult blood testing, flexible sigmoidoscopy or colonoscopy. Although Australian data suggest that CTC may be a suitable alternative screening option for colorectal neoplasia in the future, no international professional body has yet endorsed the use of CTC for this indication.
- Magnetic resonance colonography is under development, but has not yet reached clinical application. MT

DECLARATION OF INTEREST: None.

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