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Case Report

A balance of clinical assessment and use of diagnostic imaging: A CT colonography comparative case report [☆]

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ABSTRACT

Computer tomography colonography (CTC) is a non-invasive procedure which has replaced barium enema. CTC uses helical images of a cleansed and gas-distended colon for the diagnosis and treatment of colonic neoplasms. This case study compares 2 patients: one with positive pathology (patient A) and another as comparator (patient B) with a similar pathology to discuss and debate possible treatment pathways. Patient (A) CTC showed 2 polyps: 6 mm and 10 mm, which the colorectal surgeons thought only needed follow-up. Our comparator (patient B) displayed a similar pathology which measured 9 mm. In this case (patient B), there was mutual agreement with the surgeons for polypectomy but without haematology involvement which was atypical of the usual pathway. The surgeons did not see the 9 mm polyp at polypectomy which could be due to observer error or radiology reporter error. Given that conventional colonoscopy is more sensitive in detecting polyps; a repeat of both tests could confirm the presence of polyp, however, the surgeons gave patient (B) a virtual appointment and requested a repeat CTC in 12 months. In colorectal medicine there can be variations in the treatment of patients with polyps. While a repeat of both tests could confirm the presence of polyp in patient (B), the surgeons' decisions regarding the patient's treatment reflected a balance of confidence in clinical assessment and use of diagnostic imaging which can reduce unnecessary requests and use of diagnostic tests.

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Background

The practice of computed tomography colonography (CTC) is the imaging modality of choice for the detection of colorectal cancer. Colorectal cancer is the second and third highest cause of death in women and men, respectively, in the UK and now the third leading cause of death in both sexes [1,2]. CTC is a non-invasive procedure which has replaced barium enema and uses helical computed tomography (CT) scans to obtain images of thin slices of cleansed and gas-distended colon for the diagnosis and treatment of colonic neoplasms [3].

We will discuss 2 cases of polyps using clinical history and treatment pathways, influential guidelines, policies and procedures, radiological appearances, definitive diagnosis of pathology, and management options underpinned by patient-centered care.

Case report

Patient's (A) journey from referrer to CTC exam

A 91-year-old patient with history of Dukes' B adenocarcinoma, right hemi-colectomy, and possible polyp recurrence presented for a CTC procedure. The clinical data fell within the indication for CTC. Other clinical indications for CTC include blood in stool, weight loss, change in bowel habit, and abdominal pain [4,5]. The patient was referred to radiology by a Colorectal Consultant under the two-week wait (TWR) and under the umbrella of a symptomatic patient. The request was sent to the appointments team via the radiology referral email and vetted as per the Royal College of Radiologists (RCR) guidelines by one of the senior CT Radiographers to ensure it was justified to be performed. The RCR guidelines stipulate that a proper vetting process should be in place for all CT examinations which includes CT colonography [6]. The Ionizing Radiation (Medical Exposure) Regulations IR(ME)R, 2017, stipulate that all imaging examinations require vetting to ensure they are appropriate for the clinical question and trained radiographers can vet CT requests [6–8]. The vetted request was then used to make an appointment within the TWR guidelines. The patient presented on the appointment date, was consented outside the scanning area to avoid any form of coercion and the CTC was performed [9,10].

The CTC examination was performed with administration of Buscopan and intravenous contrast injection (on the supine view as per the Trust's policy) and because there were no contraindications arising from answers from the CTC pre-procedure questionnaire. The CTC quality was optimized with good bowel preparation and adequate bowel distension. The good bowel preparation resulted from the dual use of gastrografin: (75 mLs) to emulsify stool adhering to bowel allowing secondary catharsis and (25 mLs) for the tagging of residual fluid for the visualization of submerged polyps [11]. In addition, distention was good on the first view (left lateral decubitus) except for the upper section of the descending colon which was noted during the on-table review. However, the upper descending colon displayed good distention on the sub-

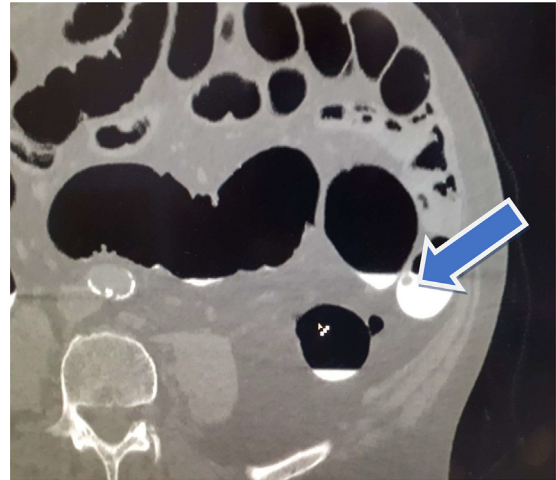


Fig. 1 – This is an axial supine view of patient's (A) large bowel that has been cleansed with gastrografin. The blue arrow points to a 6 mm pedunculated polyp (polyp with a stalk) in the descending colon.



Fig. 2 – An axial supine view of patient's (A) large bowel showing a 10 mm sessile polyp in the sigmoid colon (yellow arrow).

sequent supine view which was enough to allow detection of the polyps.

Constructing the radiological report (patient A)

Two and 3 dimensional (2D and 3D) CTC software through Picture Archiving and Communication System (PACS) and Phillips Applications and CRIS reporting platform were used to construct a CTC radiological report [12]. During the review of the images from rectum to caecum and from caecum to rectum on 2 views (supine and left lateral decubitus image acquisitions) 2 polyps and diverticulosis were detected. The resultant CTC images had good distention and preparation as evidenced by homogenous low viscosity fluid coating the colonic mucosa allowing for the visualization of polyps, and diverticular disease in the sigmoid colon (Figs. 1 and 2). The

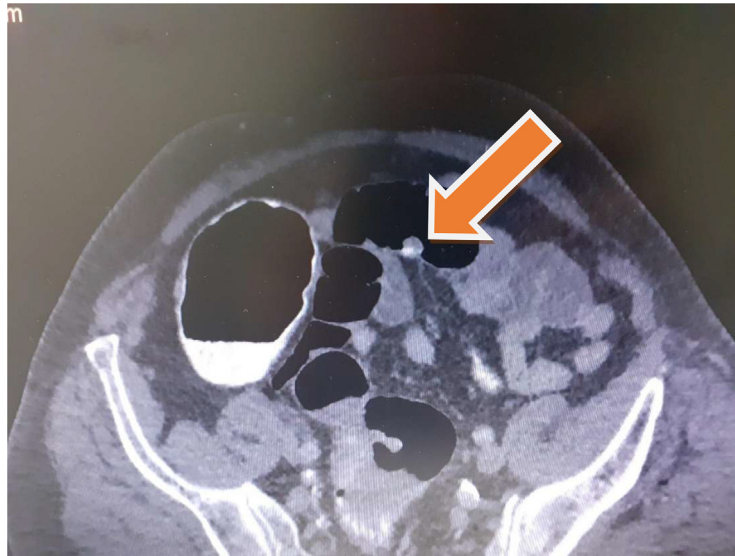


Fig. 3 – An axial supine view of patient's (B) large bowel showing a 9 mm polyp (orange arrow).

appendix was not visualized below the normal fatty ileocecal valve. The polyps found were characterized as a 6 mm pedunculated polyp (polyp with a stalk) in the descending colon, and a 10 mm sessile polyp in the sigmoid colon [13,14].

The journey from CTC to treatment and management options

While many 'polyps do not become cancer, it is believed that majority of colorectal cancer arise within benign adenomatous polyps which then develop into adenocarcinomas after a long sequence of transformation [15,16]. As such, the management and treatment of polyps needs proper discussion with the patient to establish the best management and treatment pathway. There are many treatment options for treating polyps with the most frequent option being the removal of the polyp with a wire loop during a procedure called colonoscopy. The wire will burn off or cut off the polyp and both procedures are considered painless [17].

It is rare that surgery is needed to treat polyps by removing a part of the bowel, but this may happen in conditions where the polyp is too large, has undergone some malignant transformation or there are lots of polyps. After a polyp is removed it is normally examined in the laboratory to confirm if it is malignant, if all of the polyp has been removed and if there is a risk of it regrowing [18,19]. For those patients at risk for polyps regrowing, their doctor may advise them to return for colonoscopy within 1 to 5 years while those patients with cancer changes in their polyp may need further treatment such as bowel resection [18].

There are some polyps that are large and complex which present a challenge to removing them under colonoscopy and are normally referred directly to surgery. [20] The application of advanced polypectomy and endoscopic mucosal resection (EMR) treatment options may be superior to surgery but are not normally considered [21]. While some polyps are only monitored (1 to 5 years) for any changes of concern, evidence is available to assert that screening for and removing polyps,

whether by surgery, under colonoscopy or by more advanced treatment such as EMR, reduce the risk of colorectal cancer [22,23].

The management and treatment options with the risks and benefits should be presented to the patients who make the final decision about the specific pathway. The diagnostic quality of CTC to detect colorectal cancers has been proven to have a high detection rate, and its superiority lies in its ability to always image the entire colon even in cases where colonic examination presents difficulty to optical colonoscopy [3]. As such, CTC is both a viable alternative to optical colonoscopy for screening symptomatic and non-symptomatic patients (routine bowel screening patients) and for polyp removal which reduces colorectal cancer significantly [24].

Outcome

Patient (A) had a right hemi-colectomy due to an adenocarcinoma found in the large bowel on a previous exam. As such, this patient was under surveillance for any recurrence of cancer or any development of polyps. This case was not brought to a multi-disciplinary team (MDT) because after the colorectal team reviewed the case and had discussion with the patient a decision was made for annual CTC follow-up to check any recurrence of disease and progression of polyps.

A review was done on another case (Patient B) with a strong family history of bowel cancer, change in bowel habit (CIBH), positive faecal immunochemical test (FIT test), and a comparable size polyp (9 mm). This patient (B) had a CTC in 2021 and a 9 mm polyp was found in the large bowel (Fig. 3).

Patient (B) received a letter the following day advising that a 9 mm polyp was found and could be removed with flexible sigmoidoscopy. Patient (B) agreed to have the polyp removed by filling out the pre-colorectal surgery questionnaire and a flexible sigmoidoscopy was done within seven days after the polyp was detected. Normally, histology would play a role in the treatment pathway to help characterize polyps but on this

occasion the colorectal team was happy to go straight to removing the polyp at flexible sigmoidoscopy and polypectomy [25]. While the benchmark wait-time to remove cancer is 62 days at a maximum and polyps are normally removed the same day with colonoscopy, it only took 7 days to get the patient in for the removal of the 9 mm polyp found on a CTC exam which is still impressive and efficient. Surprisingly, no polyp was found during patient's (B) sigmoidoscopy. Patient (B) was then sent a correspondence (same day of surgery) to advise of a virtual outpatient appointment in 1 month's time. If patient (A)-case under study- and the colorectal team decided to remove the polyps, this is the typical pathway that would have been followed.

Discussion

When we compare patient (A) to patient (B) we see that histology sometimes does not influence the colorectal decision for surgery since patient (B) was scheduled to have the flexible sigmoidoscopy for the removal of the 9 mm polyp without any histology result. When the colorectal surgeons performed colonoscopy to remove the 9 mm polyp from patient (B), it was not visualized as before. It could be argued that this was a result of a reporter error or colonoscopy visualization error, however, the image in the appendix for patient (B) (Fig. 3), shows a polyp which should have been confirmed on 2 views; otherwise, it should not have been called a polyp. Misdiagnosing polyps can be reduced through reporting polyps with high confidence by confirming their presence on 2 views [26]. The patient was informed that no polyp was seen and discharged with surveillance CTC requested for a year's time to make sure the bowel was clear of cancer or polyps. A virtual follow-up appointment was also scheduled with patient (B) in 1 month's time. Conventional colonoscopy is more sensitive in detecting polyps and a repeat of both tests could confirm polyp existence [27], however, the surgeons' decisions reflect a balance of confidence in clinical assessment and use of diagnostic imaging which can reduce unnecessary requests and use of diagnostic tests.

Conclusion and implication for practice

The incidence of misdiagnosing a polyp can be reduced through reporting polyps with high confidence by confirming their presence on 2 views. Clinical practice should reflect a balance of confidence between clinical assessment and use of diagnostic imaging which can reduce unnecessary requests and use of diagnostic tests.

Patient consent

Written informed consent for the publication of this case report was obtained from the patients.

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