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Colonoscopy after Diverticulitis

Jeremy Meyer and Frédéric Ris

Abstract

Patients suffering from diverticulitis are at increased risk for colorectal cancer and should undergo colonoscopy to rule out colorectal cancer. The prevalence of colorectal cancer in this population was estimated to range between 1.9 and 2.3%. This prevalence is higher in patients with complicated diverticulitis (abscess, perforation) and ranges between 6.1% and 7.9%. Therefore, interval colonoscopy is strongly recommended after an episode of complicated diverticulitis. The prevalence of colorectal cancer is lower in patients with uncomplicated diverticulitis and approaches the prevalence from screened populations. In patients with uncomplicated diverticulitis, the indication for colonoscopy is still a matter of debate and should be done on a case-by-case basis.

Keywords: Colonoscopy, endoscopy, sigmoidoscopy, diverticulitis, diverticular disease, colorectal cancer

1. Introduction

Diverticulitis is defined as the inflammation of a diverticulum confirmed by imaging and associated with compatible clinical presentation and laboratory tests [1].

First imaging modalities for diverticulitis included plain film radiography of the abdomen, contrast enema and abdominal ultrasound. However, due to their low sensitivity and specificity for the diagnosis of diverticulitis, these imaging techniques became quickly supplanted by computed tomography (CT). CT features of acute diverticulitis consist in signs of local inflammation [2], such as thickening of the colonic wall close to the diverticulum, peri-diverticulum and/or peri-colonic fat stranding and, in case of perforation, peri-colonic or distant air bubbles, peri-colonic abscess, pelvic fluid or extra-colonic feces.

Several classifications systems have been developed based on CT findings [3, 4], such as the Neff classification [5], the Kaiser classification [6] and the Hansen-Stock [7] classification. However, the most commonly used classification system is the hybrid score (both radiological and clinical) of Hinchey modified by Wasvary [8]. Classification of diverticulitis tailors its therapeutic management. More commonly, diverticulitis is usually classified into uncomplicated diverticulitis and complicated diverticulitis [1]. Uncomplicated diverticulitis is defined as the local inflammation of a diverticulum (and its associated segment of bowel) without any sign of perforation and/or abscess (corresponding to modified Hinchey 1a [8]), whereas complicated diverticulitis is defined as an acute diverticulitis with a covered perforation [9–12] (Hansen-Stock I/IIa [7]), with a paracolic abscess (modified Hinchey

1b [8]), with a distant abscess (Hinchey II [8]), or with a purulent (Hinchey III [8]) or fecal peritonitis (Hinchey IV [8]).

According to the Global Burden of Disease Study, the number of incident cases of colorectal cancer (CRC) was of 1.8 million for year 2017, with a 9.5% increase in the age-standardized incidence rate within 30 years. Moreover, CRC accounted for 896,000 deaths and 19 million disability-adjusted life-years in 2017 [13]. As a consequence, several countries have implemented screening programs, either with fecal tests and/or with colonoscopy, which allowed reducing the incidence of CRC (by removing polyps) and the mortality related to CRC (by early detection of CRC) [14]. Despite these public health interventions, CRC is often still discovered by CT protocolled to investigate weight loss, iron-deficiency anemia, change in bowel habits and/or abdominal pain. If suspicion for CRC is raised on CT, flexible sigmoidoscopy or colonoscopy are requested to confirm the diagnosis with biopsies, tattoo the lesion for potential surgery and rule out any additional synchronous CRC.

However, in patients presenting with abdominal pain and/or sepsis in the acute setting, interpretation of the CT becomes more difficult, especially in the presence of diverticular disease, whose prevalence is increasing with aging. For the radiologist and for the surgeon, distinguishing with certitude between diverticulitis and CRC is not always possible, as both pathologies share similar imaging features of local and/or distant inflammation [15–17].

Considering the difficulty in ruling out CRC based solely on CT in patients initially diagnosed with diverticulitis, recommendations have emerged in favor of interval colonoscopy after diverticulitis.

2. Colonoscopy in patients with diverticular disease

The incidence of CRC was found to be increased by 5.8-fold in patients with diverticular disease when compared to reference patients without diverticular disease [18]. However, this risk was reported to be more important within the early period after diverticular disease-related hospitalization, before decreasing to the incidence of the reference population after 2 years [19, 20]. Therefore, it is likely that the increased risk of CRC observed in the short-term follow-up period reflects initial misdiagnosis of CRC as a diverticular disease-related complication (such as diverticulitis), rather than a true long-term risk for CRC. A systematic review and meta-analysis of cross-sectional studies (450,953 patients) found no association between diverticular disease and advanced colorectal neoplasia [21]. As a consequence, colonoscopy is currently not recommended in patients with uncomplicated diverticular disease, as this population is not at increased risk for CRC.

3. Colonoscopy after diverticulitis

The primary indication for performing colonoscopy after diverticulitis is to rule out CRC, with the rationale that patients with diverticulitis are at increased risk for CRC. Therefore, numerous observational studies have reported the prevalence and/or the incidence of CRC in patients diagnosed with diverticulitis, and were pooled into several systematic reviews with/without meta-analyses [22–27].

A recent and large systematic review and meta-analysis pooling both observational studies and population-based studies (50,445 patients) estimated the pooled

prevalence of CRC to be of 1.9% in patients initially diagnosed with diverticulitis. This prevalence was of 2.3% when performing subgroup analysis including only studies based on colonoscopy. Moreover, the pooled prevalences of polyps, advanced adenomas and adenomas were estimated to be of 22.7%, 4.4% and 14.2%, respectively [25]. Another meta-analysis pooling only diverticulitis patients who underwent colonoscopy estimated the prevalence of CRC to be of 2.1%, and the prevalence of advanced colorectal neoplasia to be of 6.9% [24].

The incidence of CRC in diverticulitis patients is therefore higher than the incidence encountered in colonoscopy screening programs (which is approximately of 0.8% [28]). A recent observational study with a good sample size reported that patients with diverticulitis were at significantly higher risk (prevalence of 2.9%) for CRC than patients from a local colonoscopy register (prevalence of 0.3%) [29]. Moreover, patients who undergo colonoscopy are already considered at higher risk for CRC, as they were entered into the program due to either positive fecal test and/or red flags for CRC. The prevalence of CRC in this population may therefore be overestimated and not reflect the prevalence in the general population.

To ensure that patients suffering from diverticulitis are effectively at increased risk for CRC and should be targeted by endoscopic screening, the incidence of CRC in this population was compared to the incidence of CRC in a reference population, and was found to be 20 to 44-fold more important than in reference matched patients [30, 31].

Therefore, the current recommendation is that patients with diverticulitis should undergo colonoscopy to rule out CRC at least 6 weeks after the episode if no colonoscopy was done within the last 3 years. However, this recommendation differs depending on the severity of the diverticulitis episode [1].

4. Colonoscopy after uncomplicated diverticulitis

Uncomplicated diverticulitis is defined as diverticulitis without any evidence for abscess and/or perforation.

In this population, the prevalence of CRC was estimated to be of 1.3% by one large meta-analysis [25] and of 0.5% by a meta-analysis selectively including patients who underwent colonoscopy [24]. The prevalence of CRC in patients with uncomplicated diverticulitis is therefore low and close to the prevalence reported by colonoscopy screening programs (0.8% [28]). Of note, one study reported that the prevalence of CRC was of 1.2% in patients with uncomplicated diverticulitis versus 0.6% in patients from a CRC colonoscopy screening program, this difference not reaching significance [32]. Therefore, several authors have recommended to dispense patients with uncomplicated diverticulitis from colonoscopy. However, the interpretation of these data may be limited by the overestimation of the prevalence of CRC in patients from screening programs, which may not reflect the prevalence in the general population, and by heterogeneity of studies in the field.

Looking more specifically at studies which compared the incidence of CRC in patients with uncomplicated diverticulitis to the incidence of CRC in the general population, patients with uncomplicated episode may still constitute a population at risk for CRC. For instance, one study reported the incidence of CRC to be 40-fold higher in patients with uncomplicated diverticulitis than in age- and gender-matched reference patients, but was limited by a low number of incidental cases [31]. Another study documented an incidence that was 20-fold

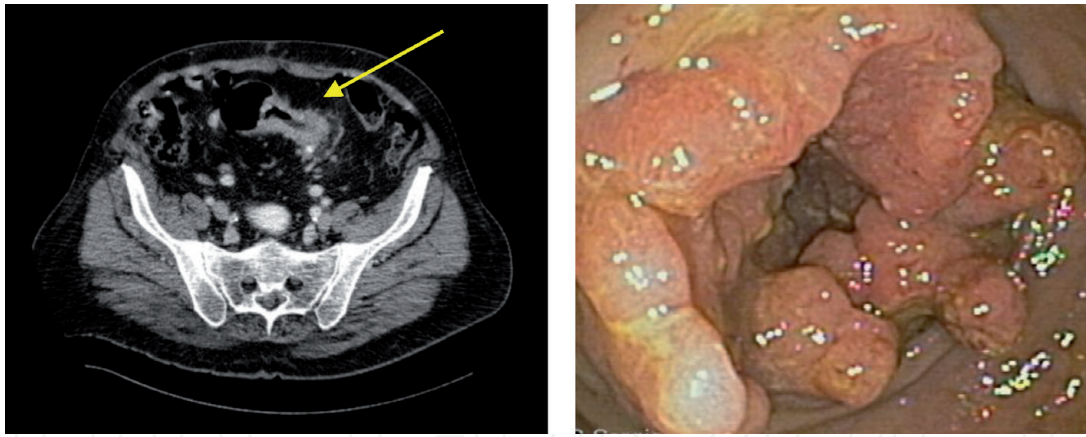


Figure 1.

Sixty-four year old female patient who presented with abdominal pain in the left iliac fossa and iron-deficiency anemia. Computed tomography reported an uncomplicated diverticulitis of the sigmoid colon (left, arrow). Flexible sigmoidoscopy found a suspect lesion at 23 cm from the anal verge (right), whose biopsies came back positive for an adenocarcinoma. The patient underwent a high anterior resection. Pathology of the operative specimen was pT3N2 (4/35).

higher in diverticulitis patients, but the study population was not limited to patients with uncomplicated diverticulitis and included all patients who had conservative management [30]. Finally, a population-based study cross-matched with data from the Cancer Registry of Norway estimated the standard morbidity ratio for CRC to be of 6.58 for patients with uncomplicated diverticulitis when compared to reference patients [33], therefore suggesting an increased risk in this population.

Moreover, colonoscopy carries a risk of complications [34]. For instance, the incidence of colonoscopy-related perforation was estimated to range between 0.09% [35] and 0.19% [36], and perforation was shown to significantly increase mortality when compared to patients without perforation [36]. Further, the cost per colonoscopy was recently evaluated to range between 188.6 USD and 501.2 USD (for purchase, maintenance and processing) [37, 38]. When considering that approximately 15 millions colonoscopies were performed in 2012 in the USA [39], targeting at risk populations is key to avoid increasing the costs for healthcare systems.

Considering the conflicting results regarding the prevalence of CRC in patients with uncomplicated diverticulitis, as well as the morbidity and cost of colonoscopy, the indication to perform colonoscopy after an episode of uncomplicated diverticulitis has remained controversial. Current guidelines recommend to do it on a case-by-case basis and to reserve it to symptomatic patients (**Figure 1**) [1, 40].

5. Colonoscopy after complicated diverticulitis

Complicated diverticulitis is by definition associated with abscess and/or perforation.

Radiological studies showed that abscess and perforation on CT are predictors for CRC [16, 22, 41–43]. Meta-analyses have estimated that the incidence of CRC in patients with complicated diverticulitis ranges between 6.1% [27] and 7.9% [25], and is 5–16.3 fold more important than in patients with uncomplicated diverticulitis [25, 27, 33].

Therefore, it is currently agreed that patients with complicated diverticulitis should undergo colonoscopy to rule out CRC (**Figure 2**) [1].



Figure 2.
(A) Ninety year old female patient who presented with acute abdominal pain in the left iliac fossa and localized guarding. Computed tomography showed a 3 cm paracolic abscess (arrow), and the episode was classified as Hinchey 1b. Due to poor response to conservative management, the patient underwent Hartmann procedure. Examination of the operative specimen found a pT1 No adenocarcinoma arising from a polyp close to the perforated diverticulum. (B) Eighty-five female patient who presented with lower abdominal pain. Computed tomography found a large paracolic abscess (arrows), and the episode was classified as Hinchey 1b. The patient underwent percutaneous drainage, which allowed to completely drain the abscess. However, interval computed tomography described an apple core imaging of the sigmoid. Flexible sigmoidoscopy found a lesion of the sigmoid compatible with cancer, and biopsies came back positive for adenocarcinoma. The patient underwent oncologic Hartmann, and pathology of the operative specimen came back as pT4 N1 (2/20).

6. Conclusion

Due to increased risk for CRC, colonoscopy should be performed after acute diverticulitis in patients with complicated episode or who remain symptomatic after uncomplicated episode.

Conflict of interest

The authors declare no conflict of interest.

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