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Colonoscopy and Colonoscopic Polypectomy Using Side-viewing Endoscope: a Useful, Effective and Safe Procedure

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Abstract Between January 1998 and December 2005, colonoscopy and polypectomy were performed in 12 patients (ten children and two adults) using a side-viewing endoscope. Earlier attempts to view the polyp and subsequently ensnare it using a forward-viewing colonoscope had been unsuccessful. A total of 13 polyps from 12 patients were removed completely. All ten polyps removed from children were juvenile polyps, while two of the three removed from adults were tubular adenomas and one was a tubulovillous adenoma. Mild oozing of blood, which stopped spontaneously, was observed in one patient. There was no other procedure-related complication. Colonoscopy and polypectomy using a side-viewing endoscope are safe and effective procedures in adults as well as children and should be attempted in patients in whom adequate visualization and polypectomy is not possible by the conventional forward-viewing endoscope.

Keywords Colon · Colonoscopy · Children · Endoscopy · Polyp · Polypectomy

Introduction

Colonoscopy is the diagnostic procedure of choice in patients having bleeding due to the presence of colorectal polyps. Once colorectal polyp has been diagnosed, the polyp is removed by means of a colonoscopic polypectomy [1–3]. The instrument of choice (colonoscope) for this procedure is conventionally a forward-viewing endoscope. However, on occasion, polyps located at sharp angles or situated behind a fold are not visible enough for a polypectomy to be performed. In other cases, the polyps found at these locations are close to impossible to ensnare using the conventional forward-viewing colonoscope. Frimberger et al. [4] have very recently used a side-viewing endoscope to perform colonoscopy and polypectomy in such situations. We report our experience of performing colonoscopy and polypectomy with a side-viewing endoscope.

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Methods

Between March 1998 and December 2005, colonoscopy and colonoscopic polypectomy were performed in 12 patients (ten children and two adults) with colorectal polyps using a side-viewing endoscope. All of these patients had undergone earlier, unsuccessful attempts at colonoscopy and polypectomy with a conventional forward-viewing colonoscope that had been carried out by an experienced endoscopist with more than 18 years of experience in performing colonoscopies and polypectomies. The side-viewing endoscopes used for performing the procedures were models JF 1T20, TJF-V70 and TJF 160 R (Olympus, Tokyo, Japan). Propofol/ketamine sedation was used in children, while midazolam and pentazocine were used in adults if the patient felt discomfort during the procedure. All procedures were performed by the senior author (SPM) who has more than 19 years of experience in performing colonoscopies, polypectomies and endoscopic retrograde cholangio-pancreatography (ERCP).

After insertion of the side-viewing endoscope (SVE) in the rectum, air was insufflated and the tip of the SVE extended to function as a forward-oblique viewing endoscope; the tip was advanced gently under vision till the

polyp was visualized. All procedures were performed in the supine position. The position of the patient was changed if needed for visualization of the colonic lumen. A written informed consent was obtained from the parents of children and the adult patients prior to the procedure.

Results

A single polyp was present in 11 patients, while two polyps were present in one adult. All of the polyps were pedunculated. The clinical details of the patients and procedures performed are shown in Table 1. A visually complete polypectomy could be performed in all the patients (Figs. 1–4), and fluoroscopy was not required in any patient. Some difficulty was encountered in the proper positioning of the snare and subsequent ensnaring of the polyps in the initial patients. However, after a couple of cases, the procedure became as easy as performing colonoscopic polypectomy with a conventional forward-viewing colonoscope. Mild oozing of blood was observed in a child with a polyp situated in the sigmoid colon. The bleed stopped spontaneously and no therapeutic procedure was needed. No complications were observed in any other patient. All of the polyps could be retrieved, and these were sent to the laboratory for histological examination. The patients were observed overnight in the hospital and discharged the next morning.

Follow-Up

Patients having juvenile polyps were asked to report if there was bleeding from the rectum. The two adults with adenomatous polyps have been followed for 6 and 4 years, respectively, and there has been no recurrence or development of new polyps. One child with a juvenile polyp had recurrence of bleeding from the rectum 3 years after the first polypectomy. A conventional forward-viewing colonoscopy revealed a 15-mm polyp with ulceration in the rectum. Polypectomy was performed. Histological examination showed that the polyp was again juvenile in nature. The polyp removed by side-viewing endoscopy was situated in the descending colon, and neither the forward-viewing colonoscopy nor the side-viewing endoscopy had shown any other polyp when the first polypectomy was performed.

Table 1 Clinical features of patients and the polyps

Location of polyp	Polyp size (mm)	Polypectomy	Histology
Sigmoid	15	Total	Juvenile
Descending colon	15	Total	Juvenile
Descending colon	15	Total	Tubular adenoma
Hepatic flexure	15	Total	Tubulovillous adenoma
Sigmoid colon	20	Total	Juvenile
Descending colon	20	Total	Juvenile
Transverse colon	15	Total	Juvenile
Transverse colon	20	Total	Juvenile
Transverse colon	15	Total	Tubular adenoma
Sigmoid colon	20	Total	Juvenile
Descending colon	20	Total	Juvenile
Sigmoid colon	20	Total	Juvenile
Sigmoid colon	15	Total	Juvenile

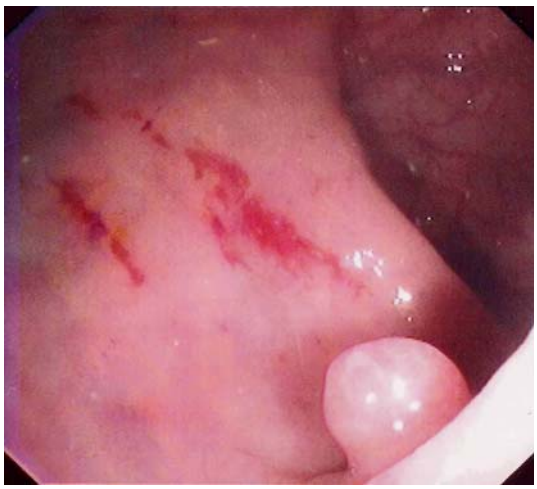

Fig. 1 Colonoscopic appearance of a polyp with a forward-viewing colonoscope. Note the "iceberg phenomenon" as only a small portion of the polyps is visible. The polyp could not be ensnared. Note the minor traumatic mucosal lesions that formed during the futile attempts to ensnare the polyp

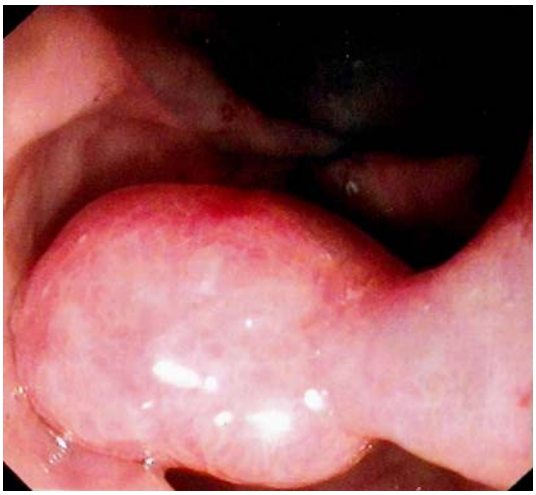

Fig. 2 Side-viewing endoscopy. The polyp is clearly visible. The peduncle can also be clearly seen

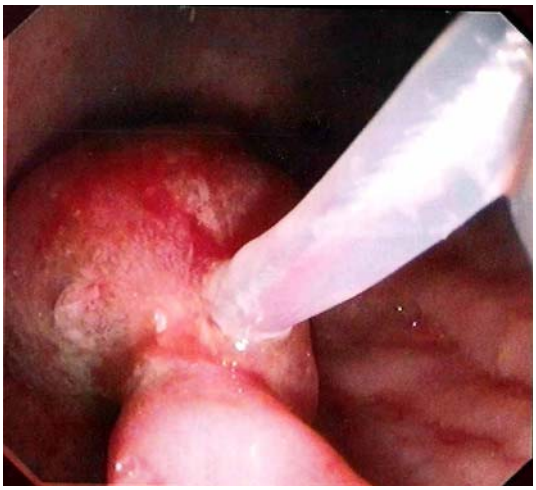

Fig. 3 The polyp has been ensnared

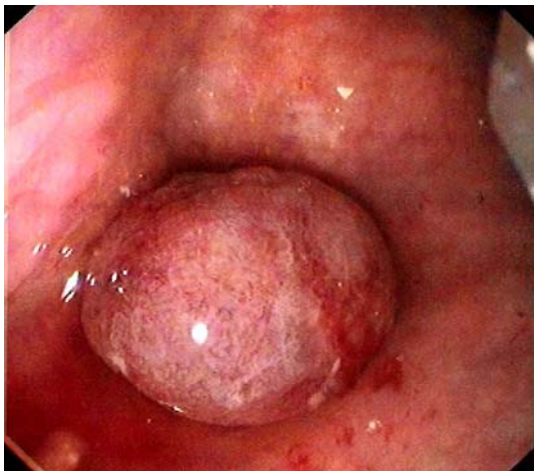

Fig. 4 Polypectomy has been performed and the polyp has been severed

Discussion

Colonoscopy and colonoscopic polypectomy are the procedures of choice for diagnosing and treating colorectal polyps. Forward-viewing colonoscope is the most commonly used instrument for the procedures [1–3]. On occasion, however, polyps may be situated at awkward positions in the colon, such as at a bend or behind a colonic fold, where visibility of the whole polyp is poor (Fig. 1) and the polyp cannot be ensnared for subsequent polypectomy. Adaptions to this approach, such as changing the patient's position, deflating air and/or straightening the colonoscope from a loop, may assist the surgeon in finding an optimum position for polypectomy to be performed [5]. In the cases of the 12 patients reported here, polypectomy was not possible with a conventional forward-viewing colonoscope despite efforts to do so. Most recently, the use of a transparent hood [6] and retroflexion of the colonoscope/gastroscope have been reported to be suitable approaches in the more trickier situations for the diagnosis and treatment of colonic polyps as well as endoscopic mucosal dissection [7–9]. However, these studies are of recent origin and had not been published when we started performing colonoscopy and polypectomy using the side-viewing endoscope. Moreover, retroflexion would have been difficult in most of our patients as the majority were children. We have since attempted this technique in some children and found it to be difficult (unpublished observations). The transparent hood has its own unique problems, with the field of vision being compromised, especially if blood sticks to or enters the hood [4]. The most common surgical procedures performed for difficult polyps are laparotomy, intraoperative colonoscopy and polypectomy [10], or laparoscopic-assisted colonoscopic polypectomy [11–14].

While most of the patients in the present study were children and all the polyps were pedunculated, Frimberger et al. [4] also used the same technique in adults for sessile polyps with excellent results. More importantly, while the most distal resection, we performed, was from the transverse colon, even polyps in the cecum can be removed, as demonstrated by Fimberger et al. [4], further demonstrating that full-length colonoscopy could be performed using a side-viewing endoscope. We did not attempt to intubate the ascending colon and cecum since all of the polyps encountered by us were present at sites distal to these areas. The advantage of the side-viewing endoscope is that polyps located proximal to sharp bends and mucosal folds are clearly visualized, thereby enabling easy ensnaring and subsequent polypectomy. The iceberg phenomenon described by Frimberger et al. [4], where only a small part of the polyp behind a bend or mucosal fold is visualized by a conventional forward-viewing colonoscope, was also clearly evident in the present study (Fig. 1).

The skill required to perform colonoscopy and polypectomy using side-viewing endoscope was acquired easily after a couple of procedures. The most difficult part of the procedure was the positioning of the polypectomy snare at the right site and the ensnaring of the polyp. Similar observations have been reported by Frimberger et al. [4]. With the newer side-viewing endoscopes, the elevator is visible most of the time, which may be a minor irritant to the uninitiated. As a complication of polypectomy, minor oozing of blood was observed in one of the patients. However, the ooze stopped spontaneously even while the polyp was being retrieved and did not warrant any therapy. These minor problems aside, colonoscopy and polypectomy using side-viewing endoscope were observed to be effective and safe procedures.

Dafnis [15] has reported the use of a duodenoscope in combination with a conventional forward-viewing

colonoscope for removing a polyp in the sigmoid colon. While this procedure is laudable, the use of two endoscopes per anus may be slightly more inconvenient to the patient. The side-viewing endoscope can reach not only the transverse colon (as in this study) but even the ascending colon and cecum, enabling polypectomy at these locations [4]. However, we are of the opinion that this technique requires a good amount of training and expertise, and should be performed by an endoscopist with a long experience of performing colonoscopies and polypectomies. The surgical approaches mentioned above [10–13] are clearly more invasive and may not be needed in most cases if the technique of side-viewing colonoscopy and polypectomy is practiced.

To summarize, this study has demonstrated that polyps which are not fully visible and therefore cannot be removed by polypectomy using a conventional forward-viewing colonoscope can be tackled using a side-viewing endoscope. The procedure is not only effective but also safe for adults as well as children.

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