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Complications of Colonoscopy and its Management: A Single Gastroenterologist Experience

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ABSTRACT

BACKGROUND

Colonoscopy is a widely used procedure and although is generally safe, it could have both gastrointestinal and non-gastrointestinal complications. The aim of this report is to assess the major complications of colonoscopies performed by one expert gastroenterologist and their management in Tehran Iran.

METHODS

We have recoded the rates of adverse events and their management in all the colonoscopies performed by a single expert gastroenterologist during 23 years (1994-2017). Demographic factors including age, race, and sex, and colonoscopy findings and patients' comorbidities were recorded.

RESULTS

During 23 years, 9012 colonoscopies and about 1700 polypectomies were performed. The number of serious complications was six (0.07%). Colonic perforation occurred in five patients (0.06%); three of whom had undergone polypectomies. All cases of colonic perforation were managed by surgery and all were discharged with no complications. One patient suffered from cardiac arrest just after colonoscopy in the recovery room and died 20 days after colonoscopy (0.01%).

CONCLUSION

Although the rate of adverse events after colonoscopy was low, it is still an important concern in developing screening recommendations in low and middle-income countries.

KEYWORDS:
Colon perforation, Colonoscopy, Complication, Screening, Colon Cancer

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INTRODUCTION

Colonoscopy is a diagnostic and therapeutic procedure, which is widely used for the screening of colorectal cancer and diagnosis and treatment of numerous other colorectal disorders.[1,2] Major serious and sometimes fatal complications of colonoscopy include bleeding, perforation, and myocardial infarction.[3]

Colonoscopic perforation is one of the most serious complications of colonoscopy with an incidence rate of 0.016% - 0.09% and the higher incidence rates are observed in therapeutic procedures.[3-6]

We aimed to determine the incidence and outcomes of complications that occurred after diagnostic and therapeutic colonoscopies performed by an expert gastroenterologist in Tehran Iran.

Table 1: Characteristics of patients with colonoscopy complications (n = 6)

No	Age	Sex	Underlying disease	Indication	Colonoscopy findings	Procedure	Complication	Outcome
1	48	Female	IBS	CRC screening	Diverticulosis and polyps	Polypectomy	Perforation	Surgery
2	67	Male	IBS	CRC screening	Normal	None	Perforation	Surgery
3	49	Male	IBS	CRC screening	Polyps	Polypectomy	Perforation	Surgery
4	57	Male	Rectal cancer	Surveillance	Rectal cancer recurrence	biopsy	Cardiac arrest	20 days admission in ICU -Death
5	57	Male	Ulcerative colitis	Surveillance	Polyps	Polypectomy	Perforation	Surgery
6	68	Male	IBS	CRC screening	Diverticulosis and polyps	Polypectomy	Perforation	Surgery

CRC: Colorectal cancer, IBS: Irritable bowel syndrome

MATERIALS AND METHODS

We retrospectively reviewed the medical records of all major complications occurring after total colonoscopies performed by the corresponding author (RM) during 23 years in two private colonoscopy suits in Tehran (Mehr Hospital and Masoud Clinic during 1994-2017). The medical records included consistent data about early major complications. A major complication was defined as a complication requiring admission to a hospital. Data of sex, age, underlying diseases, clinical presentations, indication of colonoscopy, colonoscopy findings, complications, treatment types, and outcome data of complicated cases were extracted from the medical records.

RESULTS

9012 colonoscopies were performed by a single gastroenterologist from 1994 to 2017. The most common indication for total colonoscopy was colorectal cancer screening examination in patients with IBS like symptoms older than 50 year of age. Overall, six serious complications happened out of 9012 procedures. (Table 1).

A total of five perforations (0.055%) were diagnosed after performing 9012 colonoscopies. Among more than 1700 polypectomies performed, three were complicated by a colonic perforation. A 57-year-old man with a history of hypertension, ischemic heart disease, and rectal cancer was scheduled for surveillance colonoscopy and developed cardiac arrest immediately after finishing the procedure in the recovery room. He was admitted to the intensive care unit with a diagnosis of myocardial infarction and unfortunately died after 20 days.

DISCUSSION

We described serious complications following total colonoscopies performed by a single gastroenterologist from Tehran Iran. For 9012 colonoscopies performed during 23 years, the incidence of complications was 0.66 per 1000 procedures (0.066%) with a perforation rate of 0.55 per 1000 (0.05%) and a mortality rate of 0.11 per 1000 procedures, which was due to cardiac arrest post-colonoscopy. The rate of cardiorespiratory complications associated with colonoscopy is reported to be around 0.1% per 1000.[3] Colon perforation rate reported here was higher in patients with polypectomy, which is comparable to recently published data.[3] In a large population study that evaluated the complications within 30 days of 2,802,388 colonoscopies including 1,580,318 colonoscopies for screening/surveillance and 1,222,070 colonoscopies for other reasons, the perforation rate was 772 (0.05%) and 878 (0.07%), respectively.[5]

Three out of five perforations in this study occurred in the first 3 years of the endoscopist's experience and the remaining two were happened over the following 20 years. It can be concluded that although there may be a lower rate of complications by learning curve, the risk of colonoscopic perforation never disappears despite increased experience of endoscopists with the procedure.[7] Comparison of colon perforation rates between our study and the others is shown in table 2.

Complications during and after colonoscopy are inevitable but sometimes preventable. Although complication rates during screening colonoscopy are low, increasing the number and diversity of invasive procedures performed during colonoscopy might have led to more

Table 2: Comparison of colon perforation between our study and the others

Study	Year	Number of colonoscopies	Location	Perforation N (%)	Procedure	Outcome
1	2017 [5]	2,802,388	United States	1650 (0.06)	1,420,245 biopsies or interventions (1111 perforations) 1,382,143 diagnostic procedures (539 perforations)	Nearly all perforations resulted in hospital admission.
2	2009 [7]	277,434	United States	228 (0.08)	N/A	N/A
3	2003 [8]	116,000	United States	37 (0.03)	Twenty-four (65%) procedures were diagnostic, and 13 (35%) were therapeutic.	All patients were hospitalized; 35 (95%) underwent exploratory laparotomy, and 2 (5%) were treated conservatively. No patient died.
4	2001 [9]	34,620	United States	31 (0.09)	Diagnostic procedures:13 therapeutic colonoscopy:18	21 patients underwent initial surgical therapy because of peritonitis or significant injury
5	2003 [10]	39,286	United States	77 (0.20)	N/A	N/A
6	2009 [11]	53,220	United States	33 (0.06)		N/A
7	2000 [12]	10,486	Scottsdale	20 (0.19)	Twelve perforations occurred after a diagnostic colonoscopy, and eight perforations occurred after therapeutic colonoscopy.	Nine patients (47%) required a surgical resection with primary anastomosis; seven (37%) required a simple closure.
8	2006 [13]	50,148	Poland	5 (0.01)	5 cases of perforation (1 of which occurred after polypectomy)	No deaths
9	2008 [14]	97,091	4 Canadian provinces *	0.085%	pooled rates of colonoscopy-related perforation: 0.085	N/A
10	Our study	9000	Iran	5 (0.055)	Two procedures were diagnostic, and three were therapeutic (polypectomy)	All patients were hospitalized and underwent laparotomy

* Four Canadian provinces (British Columbia, Alberta, Ontario, Nova Scotia)

complications.[15,16] All gastroenterologists should have a knowledge of the quality indicators of colonoscopy including optimal colonic preparation, indication, history taking including medication and physical examination, risk stratification, and sedation plan, anticoagulation, patient monitoring, photo documentation and procedure note including reporting of any complications, management of complications and discharge criteria.[17] Awareness of potential complications such as bleeding and perforation during and after colonoscopy combined with careful patient selection, helps gastroenterologists to optimally prepare patients for the procedure, provide adequate procedural sedation, minimize the risk of complications, and in the rare case of adverse procedural complications select the best management strategy and implement the best therapy for complication promptly.[15-19] Morbidity and mortality of the patients could be minimized specially if the perforation and other complications diagnosed immediately and appropriate therapy implemented promptly as was the case in this study for all 5 patients with perforation.[15-19]

In our experience, the rate of complications after colonoscopy are as low as reported in other centers in the world, but it is very important to realize that occasional cases of complications are inevitable and it is very important to be prepared for immediate diagnosis and urgent management of very rare adverse events when it happens. The only way to avoid all colonoscopy complications is to not perform any. The benefits of on time colonoscopy are clearly proven to outweigh its risks and with proper management of the potential adverse complications, it is one of the most effective tools at our disposal.

ETHICAL APPROVAL

There is nothing to be declared.

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.

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