Original Article

Ann Coloproctol 2014;30(2):88-92
http://dx.doi.org/10.3393/ac.2014.30.2.88

Annals of Coloproctology
pISSN 2287-9714 eISSN 2287-9722
www.coloproctol.org

# A Survey of Colonoscopic Surveillance After Polypectomy

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Purpose: Several guidelines have been proposed for surveillance colonoscopy after polypectomy. However, some discrepancies still exist between the guidelines and clinical practice. This study was conducted to identify Korean doctors' recommendations for the colonoscopic surveillance interval after polypectomy.
Methods: A survey of the attendees at the symposium of the 64th Annual Congress of the Korean Surgical Society was conducted. When the prepared clinical scenarios were given, attendees answered using a wireless radio-frequency audience response system. All responders' results were automatically counted immediately. Frequencies of different answers to each question were calculated, and our results were compared with those of previous surveys performed using the same questionnaire in the United States or Japan.
Results: The number of responder varied from 38 to 41. About 50% of valid responders selected 'follow-up in 3 years' for low-risk lesions, such as a 6-mm hyperplastic polyp, a 6-mm tubular adenoma, or two 6-mm tubular adenomas. Responders most-commonly selected 'follow-up in 1 year' for high-risk lesions, such as a 12-mm tubular adenoma with high grade dysplasia or a 12-mm tubulovillous adenoma. The majority of Korean doctors recommend postpolypectomy colonoscopic surveillance more frequently than American physicians did.
Conclusion: A discrepancy between the guidelines and clinical practice for the surveillance after polypectomy still exists in Korea. A surveillance program that can be easily and widely applied in clinical practice needs to be established.

Keywords: *Colonoscopy; Surveillance; Colorectal neoplasm; Polypectomy; Guideline*

## INTRODUCTION

Colorectal cancer was the third most common cancer in 2009 according to the report of the National Cancer Information Center, National Cancer Center, Korea [1]. In addition, the incidence of colorectal cancer has been rapidly increasing since 1999 by 6.7%/yr in men and 5.1%/yr in women [1]. According to a report by the Korean Society of Coloproctology on a study of colorectal polyp detection in the health screening centers of seven major hospitals, the detection rate of colorectal polyps increased by 1.5%/yr from 2009 to 2011 [2]. Because approximately 80%–85% of all colorectal cancer progress from adenomatous polyps, removing colorectal polyps during colonoscopy is important for the prevention of colorectal cancer [3-5]. Also follow-up surveillance colonoscopy is recommended for patients who have had adenomatous polyps removed [6-8].

Several guidelines for surveillance colonoscopy after polypectomy have been proposed [9-13]. In 2012, the U.S. Multi-society Task Force (USMSTF) on Colorectal Cancer updated the guidelines for postpolypectomy [9]. Major changes in the new guidelines included discouraging surveillance of hyperplastic polyps and lengthening the intervals of surveillance for 1 or 2 small adenomas to 5 to 10 years. However, Boolchand et al. [14] reported that many clinicians recommended shorter-term follow-up colonoscopy than the surveillance guidelines did. Tanaka et al. [15] also reported that doctors in Japan tended to recommend postpolypectomy colonoscopic surveillance more frequently than the USMSTF on Colorectal Cancer did. The differences between the

Received: July 25, 2013 • Accepted: September 15, 2013
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Part of this study was presented in abstract form at the 62nd Annual Meeting of the Korean Surgical Society, 2010, Seoul.

guidelines and clinical practice can cause confusion and distrust [14, 15]. Although many kinds of surveys or research are needed in order to decrease the number of these differences, there are only a few reports showing doctors' recommendations on surveillance colonoscopy in clinical practice. This survey was conducted to identify Korean doctors' recommendations for the colonoscopic surveillance interval after polypectomy.

## METHODS

The questionnaire developed by Boolchand et al. [14] in the United States (US) was selected for our survey. This questionnaire included the following hypothetical clinical scenarios: The patient was a 55-year-old man in good health who had undergone a screening colonoscopy. The colonoscopy was completed to the cecum, the quality of the colon cleansing was excellent, and the patient had no family history of colon cancer. The colonoscopic finding of this patient was assumed to include a 6-mm hyperplastic polyp, one or two 6-mm tubular adenomas, a 12-mm tubulovillous adenoma, or a 12-mm tubular adenoma with a focus of high-grade dysplasia. Another vignette included a 55-year-old man who had undergone polypectomy for a 12-mm tubular adenoma on screening 3 years earlier and for whom no polyp was found on latest surveillance colonoscopy. The practitioners were asked to select the follow-up interval that they would recommend from the following choices: colonoscopy at 6 months, 1 year, 3 years, 5 years, 10 years, or no repeated colonoscopy. This questionnaire was also used by Tanaka et al. [15] in Japan, so we tried to compare our results with those of US and Japan.

The survey was conducted at the 64th Annual Congress of the Korean Surgical Society (December 1, 2012, Seoul, Korea). The prepared questions were given to attendees of the practice guideline symposium for the management of colorectal polyps. All attendees had received the wireless radio-frequency audience response system before the symposium started. The speaker (D.K.S.) asked each question and then waited for 30 seconds for the attendees to respond. All responders' results were automatically counted immediately.

Statistical analyses were performed using SPSS ver. 14.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were performed on all variables, and frequencies of different answers to each question were calculated. The chi-square test was used to compare our results with those of previous studies performed in the US or Japan. A P-value less than 0.05 was considered statistically significant.

## RESULTS

The number of responders was 38 to 41. The first two questions were answered by 38 attendees, the next three questions by 39 attendees and the last question by 41 attendees. The answers to each question are shown in Table 1. About 50% of valid responders selected 'follow-up in 3 years' for low-risk lesions, such as a 6-mm hyperplastic polyp, a 6-mm tubular adenoma, or two 6-mm tubular adenomas. However, 37% selected 'follow-up in 5 years' for a 6-mm hyperplastic polyp. On the other hand, 39% and 44% selected 'follow-up in 1 year' for a 6-mm tubular adenoma and for two 6-mm tubular adenomas, respectively. Responders most-commonly selected 'follow-up in 1 year' for high-risk lesions, such as a 12-mm tubular adenoma with high grade dysplasia or a 12-mm tubulovillous adenoma (77% and 62%, respectively). Of the responders, 18% and 39% selected 'follow-up in 6 months' for a 12-mm tubular adenoma with high grade dysplasia and a 12-mm tubulovillous adenoma, respectively. Many doctors tended to recommend surveillance in 5 years or in 3 years for a patient with no polyps in whom a 12-mm tubular adenoma had been detected 3 years earlier (61% and 37% respectively). The differences of results for the same questionnaire among three nations, US, Japan, and Korea, are shown in Table 2.

The recommended surveillance interval for a single 6-mm hyperplastic polyp in Korea was significantly shorter than in the US ($P < 0.001$), but longer than in Japan ($P < 0.001$). The recommended surveillance intervals for a single 6-mm tubular adenoma and two 6-mm tubular adenomas were shorter in Japan than in Korea ($P < 0.001$). However, there was no difference between Ko-

**Table 1.** Results of follow-up recommendation

| Clinical scenario | Doctors who recommend surveillance | | | | | |
|---|---|---|---|---|---|---|
| | 6 mo | 1 yr | 3 yr | 5 yr | 10 yr | No repeated |
| 6-mm Hyperplastic polyp | 0 (0) | 5 (13.2) | 19 (50.0) | 14 (36.8) | 0 (0) | 0 (0) |
| 6-mm Tubular adenoma | 0 (0) | 15 (39.2) | 20 (52.6) | 3 (7.9) | 0 (0) | 0 (0) |
| 12-mm Tubular adenoma with high grade dysplasia | 7 (18.0) | 30 (76.9) | 2 (5.1) | 0 (0) | 0 (0) | 0 (0) |
| 12-mm Tubulovillous adenoma | 15 (38.5) | 24 (61.5) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Two 6-mm tubular adenomas | 0 (0) | 17 (43.6) | 20 (51.3) | 2 (5.1) | 0 (0) | 0 (0) |
| No polyps in a patient with a 12-mm tubular adenoma 3 years earlier | 0 (0) | 0 | 15 (36.6) | 25 (61.0) | 1 (2.4) | 0 (0) |

Values are presented as number (%).

**Table 2.** Comparative results of follow-up recommendations in Korea, Japan and United States

| Clinical scenario | Doctor who recommend surveillance | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ≤1 yr | | | 3 yr | | | 5 yr | | | >5 yr | | |
| | US | JP | KR | US | JP | KR | US | JP | KR | US | JP | KR |
| 6-mm Hyperplastic polyp | 16 | 32 | 13 | 16 | 1 | 50 | 29 | 3 | 37 | 35 | 4 | 0 |
| 6-mm Tubular adenoma | 25 | 75 | 39 | 46 | 2 | 53 | 23 | 0 | 8 | 3 | 3 | 0 |
| 12-mm Tubular adenoma with high grade dysplasia | 85 | 97 | 95 | 12 | 1 | 5 | 2 | 2 | 0 | 1 | 0 | 0 |
| 12-mm Tubulovillous adenoma | 59 | 91 | 100 | 33 | 8 | 0 | 6 | 0 | 0 | 1 | 1 | 0 |
| Two 6-mm tubular adenomas | 37 | 81 | 44 | 43 | 7 | 51 | 15 | 0 | 5 | 1 | 2 | 0 |
| No polyps in a patient with a 12-mm tubular adenoma 3 years earlier | 2 | 20 | 0 | 21 | 1 | 37 | 57 | 9 | 61 | 18 | 0 | 2 |

Values are presented as percentage.
US, United States (n=568); JP, Japan (n=131); KR, Korea (n=38 to 40).

rea and the US Surveillance for a single 12-mm tubulovillous adenoma was recommended more frequently in Korea and Japan than in the US ($P < 0.001$). However, no significant differences were found in surveillance for a 12-mm tubular adenoma with high grade dysplasia among Korea, Japan and the US. A statistically significant difference was found in the case of no polyp, but a previous tubular adenoma; surveillance was recommended most frequently in Japan, followed by Korea and the US ($P < 0.05$).

## DISCUSSION

Postpolypectomy surveillance has become a major issue due to increasing number of cases involving a screening colonoscopy and polypectomy [8, 16-18]. Several societies, including the USMSTF on Colorectal Cancer, have proposed guidelines for surveillance colonoscopy after polypectomy. However, some differences still exist between the guidelines and clinical practice [9, 14, 15, 19]. Many doctors tend to recommend shorter intervals for surveillance colonoscopy because of their concern about interval cancers and follow-up loss, even though they know the surveillance guidelines well [14, 15, 20]. Much effort is needed to decrease the number of differences between the guidelines and clinical practice, which can cause legal problems, as well as confusion and distrust among patients.

In 2006, Kang et al. [21] reported the results of a survey on the surveillance interval after polypectomy for members of the Korean Association for the Study of Intestinal Diseases. They found many Korean doctors recommended an interval shorter than American Gastroenterology Association's guideline. In 2012, the Korean Society of Gastroenterology proposed Korean guidelines for postpolypectomy colonoscopic surveillance [12]. They defined "the high-risk findings" of the index colonoscopy as follows: "(1) 3 or more adenomas, (2) any adenoma larger than 10 mm, (3) any tubulovillous or villous adenoma, (4) any adenoma with high-grade dysplasia, and (5) any serrated polyps larger than 10 mm" [12], and they recommended the following: "In patients without any high-risk findings at the index colonoscopy, surveillance colonoscopy should be performed five years after the index colonoscopy. In patients with one or more high-risk findings, surveillance colonoscopy should be performed three years after the polypectomy" [12]. This guideline is relatively simple compared to that proposed by the USMSTF; however, it has several limitations. First, no high-quality evidence exists for deciding the surveillance interval because there are few reports on colonoscopy surveillance in Korea. Thus, they did not make a strong consensus statement. Second, they overlooked the importance of complete removal of the adenomatous polyp. However, they did comment briefly that the surveillance interval could be shortened based on the quality of the index colonoscopy, the completeness of polyp removal, the patient's general condition, and the patient's family and medical history. Usually, short-term follow-up colonoscopy (or sigmoidoscopy) in 3 to 6 months for confirming the complete removal of polyps is recommended after the removal of a high-risk adenoma [9-11].

In 2012, the Korean Society of Coloproctology also proposed the "1-3-5" surveillance guideline: follow-up colonoscopy in 1 year for the high-risk group - a patient having more than 3 adenomas, high grade dysplasia, a tubulovillous adenoma or an adenoma more than 10 mm in diameter; follow-up colonoscopy in 3 years for a patient with 1 or 2 tubular adenomas (less than 10 mm in diameter and without high cellular atypia); follow-up colonoscopy in 5 years for a patient without an adenomatous polyp [22]. This guideline is relatively easy, simple and convenient in clinical practice. Comparing this guideline to our survey results, Korean doctors most-commonly selected the following follow-up recommendations as the guideline: 'in 1 year for the high-risk group' and 'in 3 years for a patient with 1 or 2 tubular adenomas.' However, 50% of the responders selected 'follow-up in 3 years' for a 6-mm hyperplastic polyp. According to the guidelines, 'follow-up colonoscopy in 5 years' should have been selected for a patient without an adenomatous polyp. Possible reasons for this result may have been that they did not have confidence enough in their own examina-

tion and that distinguishing serrated adenomas from hyperplastic polyps is difficult. Although several limitations still exist, we expect this guideline to be widely used by many Korean doctors, but they should be revised based on better feedback on clinical results in the future.

In our study, we found that many Korean doctors tended to recommend postpolypectomy colonoscopic surveillance more frequently, as did Japanese doctors than American physicians [15]. That might have been affected by the higher incidence of flat or depressed lesions and the lower cost of colonoscopic examination in Korea and Japan compared to the US. The colonoscopy miss rate for adenomatous polyps was reported to be as large as 16% to 33%, and it may even be larger for flat or depressed lesions [23-25]. Korean or Japanese endoscopists have a relatively good skill for colonoscopy; therefore they might easily recommend surveillance at short time intervals [15]. Another interesting result in our study is that Korean doctors tend to recommend colonoscopic surveillance for the low-risk group less frequently than Japanese doctors. We cannot explain exactly the reason for these results because the comparison was conducted indirectly based on the results from two different surveys. Further studies are needed to confirm the differences in colonoscopic surveillance in practice between Korea and Japan.

Our study has several limitations. First, this study was conducted for the attendees at the symposium of the Annual Congress of the Korean Surgical Society. The number of responders was relatively small, and the population was limited to colorectal surgeons. We could not obtain the responder's characteristics, including gender, age and clinical experiences. Also, they may not have had enough time to think about the answers - only 30 seconds for each question. Second, we could not consider the difference in the times when the studies were conducted. Because surveillance guidelines after polypectomy have been revised several times since Boolchand et al. [14] and Tanaka et al. [15] conducted their survey, a direct comparison of our results with those from their studies is difficult.

At the time of our study, we regret that there was no National Polyp Study in Korea. In the US, as a result of the National Polyp Study report in 1993, the guideline of a follow-up surveillance in 3 years after polypectomy was accepted and applied for most patients, after which the guideline was updated according to a meta-analysis including several studies conducted later [5, 7, 26]. In Japan, the results of the Japan Polyp Study showing postpolypectomy colonoscopic surveillance, which has been conducted since 2000, are pending [27, 28]. In Korea, several postpolypectomy surveillance studies have been conducted by using multicenter data or single-center cohorts [18, 29, 30]. However, such studies cannot be called a National Polyp Study in Korea. We hope that a National Polyp Study, including large, prospective, multicenter cohorts, will be conducted in Korea in the near future.

In summary, we found that in Korea, differences still exist between the guidelines and clinical practice for the surveillance after polypectomy. The majority of Korean doctors recommend that postpolypectomy colonoscopic surveillance be done more frequently than American physicians do. A surveillance program that can be easily and widely applied in clinical practice in Korea needs to be established in the future.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

## ACKNOWLEDGMENTS

This study was supported by a grant from the National Cancer Center (NCC-1210170).

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