7

Colorectal cancer risk in adenoma patients: a nation-wide study

Abstract

Introduction

Colorectal cancer incidence after adenoma removal has been studied in selected populations of adenoma patients. The present study estimates the trend in colorectal cancer incidence after adenoma removal in actual clinical practice.

Material and Methods

From PALGA, a nation-wide network and registry of histo- and cytopathology in the Netherlands, we extracted data of all patients diagnosed with colorectal adenomas between 1 January 1988 and 1 October 1998. The data were used to calculate population-based colorectal cancer incidence rates after adenoma removal.

Results

A total of 78,473 adenoma patients were followed for a mean of 4.5 years after the first adenoma removal. The colorectal cancer incidence ratio compared with the general population matched by age and sex was 38.4 (37.3-39.5) in the first year after adenoma removal and 1.5 (95% CI, 1.4-1.6) after the first year. The incidence ratio decreased from 2.8 (2.5-3.1) in the second year to 0.9 (0.6-1.2) in year 9-11. This time trend is the opposite of the upward time trend that was expected after adenoma removal.

Conclusions

Adenoma patients in the Netherlands are at increased risk for colorectal cancer compared to the general population. The high cancer incidence in year 1-5 after polypectomy can be explained by a colonoscopic sensitivity for cancer of approximately 90%.

Introduction

Adenomas are considered to be precursors of colorectal cancer and are effectively removed by endoscopy. A complete initial colonoscopy with polypectomy is recommended in individuals with adenomas because they are at increased risk for colorectal cancer. Furthermore, colonoscopic surveillance is recommended in these individuals in order to detect missed and newly developed adenomas and asymptomatic cancer. Several studies in selected centers and selected adenoma patients reported on the colorectal cancer incidence in the first years after adenoma removal. The incidence ratio compared with the general population ranged from 0.2 in the National Polyp Study [Winawer 1993a], and 0.4 in the study of Lund *et al*. [Lund 2001] to 1.3 in the Funen study [Jørgensen 1993]. Patients in these studies had undergone complete initial colonoscopy or incomplete initial colonoscopy followed by (negative) barium enema. In the National Polyp Study, patients with large sessile polyps were excluded from the analysis. In unselected adenoma patients, the incidence ratio after adenoma removal may be higher than in these studies, because the compliance with and the quality of the initial colonoscopy and colonoscopic surveillance is lower than in the selected centers and because patients with large sessile polyps are included.

The studies published to date have been too small to study the trend in colorectal cancer incidence according to time since polypectomy. However, the expectation was that the effect of polypectomy would decline over time. In the first years after polypectomy, colorectal cancer incidence was expected to be low. It was thought that the incidence would later gradually increase to the level of the incidence in adenoma patients who had not previously undergone polypectomy.

The aim of the present study was to estimate the colorectal cancer incidence ratio in actual clinical practice in a large unselected population of adenoma patients. A further aim was to investigate the trend in incidence ratio according to time since first adenoma removal. To this end, we investigated the incidence of colorectal cancer in all 78,473 patients who were diagnosed with adenomas in the period from 1 January 1988 to 1 October 1998 in the Netherlands.

Material and Methods

All Dutch pathology laboratories are connected to the PALGA, a nation-wide network and registry of histo- and cytopathology. The last laboratory was connected in 1990. This registry contains 99% of all pathology reports in the Netherlands. Patients in this registry are identified by date of birth, sex, and the first 4 characters of their family name. All pathology reports on colorectal tissue in the observation period between 1 January 1988 and 1 October 1998 were retrieved. The following items were made available for each report: sex, date of birth, date of pathology review, conclusion text and diagnostic code [Stichting PALGA 1999]. The diagnostic code is based on the Systematized NOmenclature of MEDicine (SNOMED) issued by the College of American Pathologists.

It contains a topological term and a morphology term describing the finding, e.g. “colon*villous adenoma”. The SNOMED morphology codes are identical to the codes in the International Classification of Diseases for Oncology (ICD-O-2; World Health Organization) [World Health Organization 1990]. The SNOMED codes that were used to classify a lesion as an adenoma, a carcinoma in situ or colorectal cancer are described in Appendix A. The date of first adenoma removal was defined as the date of first adenoma diagnosis or diagnosis of carcinoma in situ in the observation period. It was unknown whether these adenomas were removed or only biopsied and whether the adenomas were located in the proximal or distal colon.

The SNOMED codes for colorectal cancer used in this study are identical to the codes used by the Netherlands Cancer Registry to classify histological results as colorectal cancer. The colorectal cancer definition used and the retrieval from PALGA was checked by comparing the resulting number of new colorectal cancer cases in 1995, which was 7985, to the number of histologically confirmed colorectal cancer cases reported in the national cancer registry, which was 7993 [Visser 1998]. In young age groups, the number of cancer cases differed, but the numbers were small. In the 55-59 age group, the number of cancer cases was 630 according to the definition, while the national cancer registry reported 599 cases (difference: 5.2%). In the 5-year age groups between 60 and 79 years, the difference in colorectal cancer cases was <2%.

During the period of observation, adenomas were found in 101,290 individuals. The results are based on 78,473 of these individuals who had no bowel disease or resection of the bowel at the date of first adenoma removal. Thus, patients with colorectal cancer (n=8188) or a resection of the colorectal tract (n=100) before or at the date of the first adenoma removal were excluded. Furthermore, patients recorded in the pathology report as having inflammatory bowel disease (n=10,484), polyposis coli (n=406), and hereditary bowel disease (n=54) were excluded from the analysis. Patients with a lesion that was classified as “suspect” at the date of first adenoma removal (n=3585) were also excluded from the analysis, as these were mainly expected to be suspected malignancies. This was confirmed by the high number of colorectal cancers detected in these patients (incidence rate 560 per 1000 person years).

Adenoma patients were followed up in the registry from the date on which they underwent adenoma removal for the first time to 1 October 1998 for the occurrence of colorectal cancer or a diagnosis of metastases of colorectal cancer in other sites. Follow-up was stopped if a non-colorectal cancer in the colorectal tract, such as lymphoma, was diagnosed, if metastases of a primary cancer in another site of the body were found in the colorectal tract, or if (partial) resection of the colorectal tract was performed for other reasons. Calculation of the expected number of cancers was based on sex- and age-specific colorectal cancer incidence rates in the general population of the Netherlands in 1993 [Visser 1996] multiplied by the observed sex- and age-specific number of person-years at risk. The ratio of observed to expected cases is reported as a standardized incidence ratio. 95% confidence intervals are reported between brackets, based on the exact Poisson distribution and are calculated using STATA 7.0.

Results

The results are based on 78,473 patients registered as having undergone adenoma removal in the period between 1 January 1988 and 1 October 1998. Table 7.1 shows the age and sex distribution of the patients undergoing initial adenoma removal during the period of this study. The adenoma diagnosis rate in the population of the Netherlands during the study period was 51 per 100,000 person years, increasing from 10 per 100,000 person years in individuals aged <50 years to 232 per 100,000 person years in individuals aged 70-79 years. Although the prevalence of adenomas is known to climb with age, this increase also reflects the (unknown) frequency of endoscopy according to age and possible calendar time. The mean age of patients undergoing adenoma removal for the first time was 64.9 years and the mean number of follow-up years after first adenoma removal was 4.5 years.

Figure 7.1 shows the colorectal cancer incidence rate by time interval since the first adenoma, and the expected incidence in the general population with the same age and sex distribution. During follow-up, 5949 colorectal cancers were diagnosed. In the year immediately following diagnosis of the first adenoma, 5002 colorectal cancers were

Table 7.1 Age and sex of the 78,473 adenoma patients included in the study with first adenoma removal in the period 1 October 1988-1 October 1998.

Characteristic	Percentage	(No.)
Sex		
Male	54	(42,294)
Female	46	(36,179)
Age group		
<50 yr.	14	(10,664)
50-59 yr.	19	(15,026)
60-69 yr.	29	(22,608)
70-79 yr.	27	(21,275)
80+ yr.	11	(8,900)

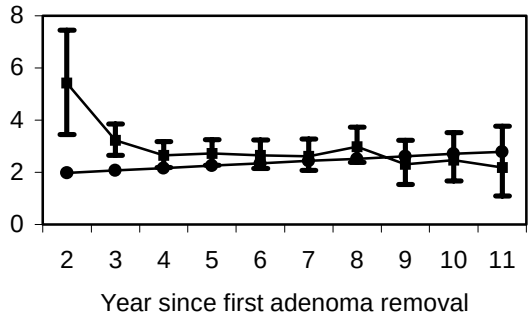

Figure 7.1 Observed colorectal cancer incidence per 1000 person years more than one year after first adenoma removal (■) and incidence rate expected in the sex- and age-matched general population (●). Observed colorectal cancer incidence in the first year after adenoma removal was 72 per 1000 person years.

diagnosed, which corresponded to a very high cancer incidence of 72 per 1000 person years and a standardized incidence ratio of 38.4 (37.3-39.5). In the second year, 327 colorectal cancers were diagnosed and the incidence dropped to 5.4 per 1000 person-years. In later years, the incidence declined somewhat over time, from 3.2 per 1000 person years in year 3 to 2.2 in year 11. The standardized incidence ratio declined from 2.8 (2.5-3.1) in the second year after initial polypectomy to 0.9 (0.6-1.2) in year 9-11 after the first adenoma removal.

Table 7.2 Standardized incidence ratio (SIR) of colorectal cancer after first adenoma removal.

Follow-up time	SIR
All	7.9 (7.7-8.1)
>3 months after first adenoma removal	2.1 (2.0-2.2)
>12 months after first adenoma removal	1.5 (1.4-1.6)
>24 months after first adenoma removal	1.2 (1.1-1.3)
>60 months after first adenoma removal	1.1 (0.9-1.2)

Some patients will be diagnosed with colorectal cancer very shortly after the initial adenoma removal, due to the adenoma being detected during the process of diagnosing cancer. Table 7.2 shows the standardized incidence ratio of colorectal cancer on exclusion of a certain period immediately following initial adenoma removal. The incidence ratio was 7.9 (7.7-8.1) when taking the total follow-up period into account, but was found to decrease to 1.5 (1.4-1.6) on exclusion of the first year, and to 1.1 (0.9-1.2) if the first 5 years after first adenoma removal are excluded. Between 5 and 11 years after undergoing adenoma removal for the first time, therefore, the colorectal cancer risk is comparable to that of the general population. In the remainder of this section, results are presented excluding the first year after first adenoma removal.

In Table 7.3, colorectal cancer incidence is stratified by age, sex, histology, and site of the first adenoma. The incidence of colorectal cancer increased with age (from 1.1 in ages <50 years to 4.1 in ages 80+ years), as expected, but the incidence ratio compared with the general population decreased with age (from 4.0 in ages <50 years to 1.1 in ages 80+ years). This age trend may be explained by the hypothesis that in young age groups, most colonoscopies are performed in individuals with a familial colorectal cancer risk or with symptoms. There were no significant differences in standardized incidence ratio according to pathology of the first adenoma. The standardized incidence ratio was smallest among patients with tubular adenomas and highest among patients with villous adenomas. The 1135 patients with carcinoma in situ had a standardized incidence ratio comparable with the patients with tubular adenomas.

The number of preventive colonoscopies probably increased between 1988 and 1998. This could explain the lower standardized incidence ratio in patients diagnosed with adenomas in the period 1992-1996 (in follow-up year 2 and 3 after first adenoma removal) compared with patients diagnosed with adenomas in 1988-1992 (1.9 versus 2.4, see Table 7.3).

Table 7.3 Colorectal cancer incidence and standardized incidence ratio (SIR) in 64,699 adenoma patients excluding the first year after first adenoma removal.

Characteristic	Incidence per 1000 person-years (cases)	SIR (95% CI)
All	3.4 (947)	1.5 (1.4-1.6)
Sex		
Male	3.3 (503)	1.3 (1.2-1.5)
Female	3.4 (444)	1.8 (1.6-1.9)
Age at first adenoma removal		
<50	1.1 (44)	4.0 (2.9-5.4)
50-59	2.8 (152)	2.7 (2.3-3.1)
60-69	3.6 (296)	1.6 (1.4-1.8)
70-79	4.4 (330)	1.3 (1.1-1.4)
80+	4.1 (125)	1.1 (0.9-1.3)
Pathology of most advanced adenoma at first adenoma removal		
Carcinoma in situ	3.6 (17)	1.4 (0.8-2.2)
Villous adenoma	5.3 (84)	2.1 (1.7-2.6)
Tubulovillous adenoma	3.5 (194)	1.6 (1.3-2.6)
Tubular adenoma	2.9 (217)	1.4 (1.2-1.5)
Adenoma, histology unknown	3.3 (435)	1.5 (1.4-1.7)
Site of first adenoma		
Rectum	4.0 (253)	1.8 (1.6-2.1)
Colon	3.1 (679)	1.4 (1.3-1.5)
Colon and rectum	3.8 (15)	1.6 (0.9-2.6)
*Date of first adenoma removal**		
1 October 1988-1 October 1992	4.9 (262)	2.4 (2.1-2.7)
1 October 1992-1 October 1996	3.8 (209)	1.9 (1.7-2.2)

* Results based on colorectal cancer cases and person years in year 2 and 3 after first adenoma removal.

In the pathology registry, individuals were identified by an identification code consisting of the date of birth, sex, and the first 4 characters of their family name. This code was not 100% unique: individuals with the same date of birth, sex, and first 4 characters of their family name were registered under a single identification code. In addition to the identification code, each pathology report was also marked with the patient's first initial, birthplace and place of residence The results were corrected for colorectal cancer cases incorrectly assigned to adenoma patients, by calculating the incidence ratio in adenoma patients to whom cancers were solely assigned if these additional identifying fields were identical in the pathology reports. According to these calculations, the standardized incidence ratio excluding the first year after first adenoma removal was 1.3 (95% CI, 1.2-1.4), declining from 2.5 (2.2-2.8) in the second year to 0.8 (0.6-1.1) in year 9-11. The incidence ratio in the first year was 37.7 (36.6-38.7). Thus, if

the results are corrected for identification problems, the trend in incidence ratio is still present, although the estimated incidence ratios slightly decrease.

Discussion

This study provides an estimate of the colorectal cancer incidence in a nation-wide population of patients after endoscopic removal of a first adenoma. The study shows that, with the current polypectomy and surveillance practice, adenoma patients have a significantly higher risk for colorectal cancer than the general population, as evidenced by the incidence ratio of 1.5 (1.4-1.6) on excluding the year immediately following initial adenoma removal. The standardized incidence ratio declined from 2.8 (2.5-3.1) in the second year to 0.9 (0.6-1.2) in year 9-11 after adenoma removal was first performed.

This unexpected downward time trend in cancer incidence following initial adenoma removal was also observed by Levi *et al.*, the only other population-based study published until now [Levi 1993]. The authors of this study followed a group of Swiss patients for a mean of 4.1 years after removal of a first adenoma. They reported a colorectal cancer incidence ratio of 3.1 in month 4-12 after polypectomy, declining to an incidence ratio of 1.8 thereafter without any further time trend.

An explanation for the downward incidence trend may be that the high incidence in the first years after polypectomy is mainly caused by cancers missed at the first adenoma removal in patients with cancer-related symptoms. Since, in the clinical situation, all patients with suspected colorectal cancer undergo endoscopy, the missed cases in the present data all relate to individuals in the total population with symptomatic colorectal cancer and synchronous adenomas. Examining the colorectal cancers diagnosed within a period of three months before to three months after initial adenoma removal, we found that a total of 8393 colorectal cancers were diagnosed “at” the initial adenoma diagnosis. During 5 years of follow-up (excluding the first 3 months), 1289 colorectal cancers were detected. On the basis of these figures, we were able to arrive at an 87% sensitivity of colonoscopy for colorectal cancer. Some of the 1289 cancers will have been new cases that were not present as cancers at the first adenoma removal. Using the MISCAN-COLON model [Loeve 1999], we estimated that approximately 230 of the cancer cases occurring between year 1-5 were new. The sensitivity estimate adjusted for these new cancer cases is 90%. This estimate agrees with the results of studies on colonoscopic sensitivity for cancer or large adenomas [Hixson 1991, Rex 1997b, Rex 1997c], which supports the hypothesis that the high incidence in year 1-5 after polypectomy is mainly caused by cancers missed at the initial adenoma removal. Not performing a second colonoscopy in adenoma patients with persistent symptoms can obviously result in delayed diagnosis and high colorectal cancer incidence that is not limited to the first year after polypectomy.

The adenoma patients without (missed) colorectal cancer at the initial colonoscopy were comprised of those who were screened because of a family history of colorectal cancer, as well as patients with symptoms not caused by colorectal adenoma or cancer. A low incidence of cancer was expected in these patients in the first years after adenoma

removal because of their having no (missed) cancer at baseline and having been screened and treated for colorectal cancer precursors: adenomas. An increase in colorectal cancer incidence was expected in later years because of new, progressive disease developing in these higher (than average) risk patients.

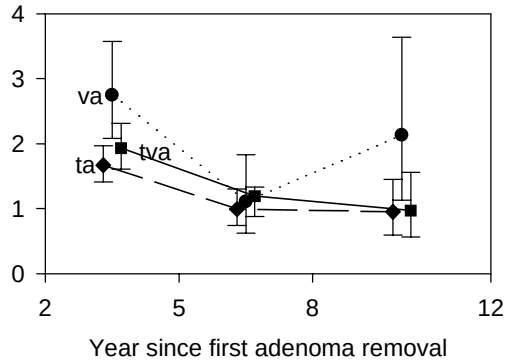

Figure 7.2 Observed colorectal cancer incidence ratio after first adenoma diagnosis according to pathology at first adenoma diagnosis: tubular adenomas (ta), tubulovillous adenomas (tva) and villous adenomas (va).

In summary, the patients with symptoms related to colorectal cancer govern the observed colorectal cancer incidence in the first years, and the patients without colorectal cancer related symptoms govern in later years. In order to investigate this hypothesis further, we calculated the observed time trend in incidence ratio separately for patients with tubular, tubulovillous, or villous adenomas (Figure 7.2). Patients with a carcinoma in situ or an adenoma with unknown histology were not included in the figure. Colorectal cancer incidence was expected to be high throughout the first years after the adenoma diagnosis, after which this would decrease and then once again increase in later years. As not only patients with missed cancer, but also patients at high risk for colorectal cancer in later years are more likely to have villous adenomas than other patients, this incidence trend was expected to be the most pronounced in patients with villous adenomas. Indeed, a high incidence was seen in patients with villous adenomas in years 2-3, presumably due to cancers missed at the first adenoma removal. By years 5-7, most missed cancers had shown up and the incidence ratio was relatively low. According to the point estimates, the incidence rate will once again start to rise in years 8-11 due to newly developed cancers. The hypothesis that two separate phenomena in two separate types of patients play a role is supported by the biphasic shape of the curve in patients with villous adenoma. Moreover, this shape is more pronounced for these patients compared to patients with tubular adenomas, while the results for patients with tubulovillous adenomas are intermediate.

Is the incidence of colorectal cancer after polypectomy affected by colonoscopic surveillance? Surveillance reduces the increase in incidence in later years in the second group of adenoma patients. Figure 7.3 shows the effect of the initial polypectomy alone and combined with surveillance colonoscopies on the colorectal cancer incidence in the National Polyp Study as estimated by the MISCAN-COLON expert model [Zauber 2000]. A major reduction in incidence results from the initial polypectomy. The model further predicts that with surveillance, the incidence will rise in the third year after the initial

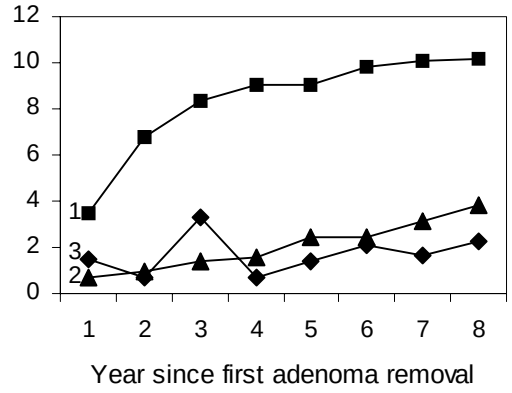

Figure 7.3 Estimated colorectal cancer incidence in adenoma patients according to the expert MISCAN-COLON model: with no initial polypectomy or surveillance (1); with initial polypectomy only (2); with initial polypectomy and surveillance (3). Age distribution and size distribution of first adenomas as in the National Polyp Study [Winawer 1993a, Winawer 1993b, Zauber 2000].

polypectomy, due to detection of asymptomatic cancer at the 3-yearly surveillance colonoscopy. However, by the sixth year after initial polypectomy, the number of colorectal cancers prevented will have compensated this increase. Thus, surveillance cannot explain the time trend in the first years after polypectomy, but may explain the absence of an increase in incidence ratio in the latter years of the present study.

Until now, most estimated incidences of colorectal cancer in adenoma patients have been based on prospective studies in selected adenoma patients with complete initial colonoscopy, polypectomy and regular surveillance in selected medical centers. The incidence ratio in these studies compared with the general population ranged from 0.2 (0.1-0.6) in the National Polyp Study [Winawer 1993a], and 0.4 (0.1-1.1) in the study of Lund *et al*. [Lund 2001] to 1.3 (0.6-2.3) in the Funen study [Jørgensen 1993]. All ratios included the first year after adenoma removal. This compares to 2.1 (2.0-2.2) in the present study (excluding the first three months after adenoma removal). Citarda *et al.* recently conducted a retrospective study in adenoma patients at seven reference centers for gastrointestinal diseases and neoplasms, in which the colorectal cancer incidence ratio was 0.3 (0.1-0.7) excluding the first two years after adenoma removal. This compares to an incidence ratio of 1.2 (1.1-1.3) in the present study. It may well be possible that many patients with symptoms related to cancer or large adenomas were excluded from these studies. Moreover, the study populations were too small and follow-up time too short to study the time trend in colorectal cancer incidence after adenoma removal.

Differences in selection criteria based on patient characteristics or the completeness of the initial examination of adenoma patients may partly cause the high incidence ratio in the present study compared to the studies mentioned. We only excluded patients with a registered history of colorectal cancer, a colonic resection, patients with registered inflammatory bowel disease, polyposis coli and other hereditary bowel disease. We had no information on gastrointestinal symptoms. In the other studies, clinical information was available and “unresolved” cases, e.g. with persistent symptoms, may not have been included. Moreover, in the National Polyp Study and the study of Citarda *et al.*, patients with sessile adenomas larger than 3cm were excluded, a proportion of whom may

have developed colorectal cancer. If these patients had been included, the colorectal cancer incidence ratio after adenoma removal may have increased to 1 or higher compared with the general population.

The National Polyp Study only included patients in whom the initial colonoscopy was complete and regarding whom the colonoscopist felt confident that the colon had been successfully cleared. In the Lund study, a barium enema was performed if the initial colonoscopy was not completed to the cecum; six months after the initial examination, a further flexible sigmoidoscopy was performed to ensure a clean left colon. In the Funen study, complete colonoscopy was attempted at the initial examination to ensure a clean colon. Barium enema was added if colonoscopy was incomplete. In patients with multiple polyps or unsatisfactory bowel preparation, colonoscopy was repeated within three months. The Citarda study only included patients with complete initial colonoscopy or partial initial colonoscopy and double contrast barium enema. It is unknown how often only a sigmoidoscopy was performed at the initial examination in the present nation-wide study, although the 1988 Dutch guidelines recommended complete initial colonoscopy with removal of all identified polyps. This may partly explain the high colorectal cancer incidence ratio in the present study. It indicates that it is important that surveillance guidelines clearly state that patients in whom adenomas are detected should undergo a complete colonoscopy. Many guidelines for surveillance of adenoma patients have been published over the past few years [Hoff 1996a, Winawer 1997, American Society for Gastrointestinal Endoscopy 2000, Nagengast 2001, Smith 2002], but most guidelines do not provide recommendations for the initial examination.

A case-control study can be performed in the present adenoma patient population in order to test our explanation of the high colorectal cancer incidence seen in the first years after the initial adenoma removal and to investigate possible improvements in patient treatment that will result in lower colorectal cancer incidence rates in the first years after adenoma removal. Cases should be individuals diagnosed with colorectal cancer within a short period after the first adenoma removal, e.g. in the second and third year, and controls should be comprised of individuals with no diagnosis of colorectal cancer and the same follow-up time. The symptoms at the initial examination, the number and quality of colonic examinations performed in these patients and the size, shape, and pathology of the initial adenomas may differ between the cases and controls. The results of the case-control study may confirm or reject the hypothesis that the high colorectal cancer incidence in the years immediately following initial adenoma removal occurs in adenoma patients with persistent symptoms. The results of such a case-control study may also lead to modified clinical guidelines, such as a recommendation to perform a second colonoscopy shortly after the initial colonoscopy in adenoma patients with persistent otherwise unexplained symptoms.

In conclusion, adenoma patients in the Netherlands are at increased risk for colorectal cancer, especially in the first years after first adenoma removal. In this study, the colorectal cancer incidence after polypectomy decreased with time since polypectomy, while an increase was expected. It is hypothesized that cancers missed during the diagnostic process cause the high cancer incidence in the first years after polypectomy,

even until the fifth year after adenoma removal. This is supported by the fact that the results are consistent with a colonoscopic sensitivity for cancer of approximately 90%. Confirmation of this hypothesis by further studies may lead to modified clinical guidelines.

Acknowledgement

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Appendix A. SNOMED codes used in the analysis

All SNOMED codes in the Palga registry are listed in [Stichting PALGA 1999].

SNOMED codes classified as adenoma

A T-code of format T68… or T67… combined with an M-code of format: M74000, M74006, M74007, M74008, M74009, M74850, M81400, M81401, M82100, M82110, M82210, M82600, M82611, M82630, M90100, M90130, M90140.

SNOMED codes classified as carcinoma in situ

A T-code of format T68… or T67… combined with an M-code of format: M80102, M80105, M81402, M81405, M82632.

SNOMED codes classified as rectal cancer

A T-code of format T68… combined with an M-code of format: M8…3, M8…9, M9…3, M8…9 and the first four digits of the M-code in the range:
8000-8004,8010-8012,8020-8022,8030-8035,8050-8052,8070-8075,
8140,8144,8200-8201,8210-8211,8220-8221,8230-8231,8240-8246,
8260-8263,8480-8481,8490,8560,8570-8573,8720-8722,8730,8743,
8770-8772,8775,8800,8890-8891,8894-8896,9140,9590-9593,9595,
9670-9673,9675,9677,9680-9682,9684-9688,9690-9691,9693-9695,
9697-9698,9702-9705,9711-9716,9723,9750,9990.

SNOMED-codes classified as colon cancer

A T-code of format T67… combined with an M-code of format: M8…3, M8…9, M9…3, M8…9 and the first four digits of the M-code in the range:
8000-8004,8010-8012,8020-8022,8030-8035,8140,8144,8200-8201,
8210-8211,8220-8221,8230-8231,8240-8246,8260-8263,8480-8481,
8490,8800,8890-8891,8894-8896,9140,9590-9593,9595,9670-9673,
9675,9677,9680-9682,9684-9688,9690-9691,9693-9695,9697-9698,
9702-9705,9711-9716,9723,9750,9990.