



## Research Article

# Difference between Endoscopic and Pathology Measures in Colon Polyps

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## Abstract

**Introduction:** Endoscopic surveillance of patients with colon polyps differs depending if they are <10 mm or ≥ 10 mm, those last one with closer endoscopic surveillance. Sometimes we base subjective endoscopic estimates; an endoscopic overestimation of the size of the polyps has been demonstrated up to 50% when compared with the measurement by pathology.

**Objective:** To establish the frequency of overestimation of the size of polyps during colonoscopy.

**Materials and methods:** A retrospective analysis of polyps detected by colonoscopy was carried out in a tertiary institution. The inclusion criteria were: polyps that were estimated by endoscopy and pathology of their size. Measurement by pathology was considered the standard. Demographic variables were analyzed, for study purposes it was divided into polyps <10 mm vs. ≥ 10 mm. Results: From a total of 426 polyps, 193 polyps were excluded because they met exclusion criteria. 233 polyps, adenomas (68.7%), hyperplastic (29.6%) and serrated (1.7%) were included out of a total of 137 patients, male sex 50.6%, mean age 62.5 years. A total of 44 polyps were endoscopically estimated as ≥ 10 mm and of these, 34.1% were <10 mm due to pathology. 188 polyps were considered <10 mm by endoscopy and 4.2% were ≥ 10 mm by pathology.

**Conclusion:** There was a substantial difference between endoscopic and pathology measurements in colon polyps. About a third of the advanced polyps ≥ 10 mm by endoscopy were <10 mm in the actual measurement by pathology.

**Keywords:** Polyps; Measurements; Overestimation; Colon

## Introduction

Colorectal Cancer (CRC) is one of the most frequent neoplasms in the West, it has been seen that it represents 10% of all cancers diagnosed per year and cancer-related mortality worldwide [1]. In Mexico, according to Globocan 2018, the CRC it is the second most common cancer in men and the fifth in women [2]. Colonoscopy is a detection and prevention method for CRC. After the procedure, endoscopists are expected to give follow-up recommendations to patients. Post-polypectomy recommendations among all people with polyps are among the most common clinical scenarios requiring guidance [3].

After a colonoscopy, the time interval for subsequent surveillance will depend on the histology, number and size of the polyps. Regularly, endoscopists determine the size of colon polyps in real time during colonoscopy, we all know that adenomatous polyps of

size ≥ 10 mm pose a higher risk of becoming adenocarcinoma; a narrower surveillance interval is recommended. Therefore, the time for subsequent colonoscopy surveillance is based on accurately estimating the size of the polyp during colonoscopy [4]. It is important to mention that the determination of the size of the polyps is often based on a subjective estimation of the endoscopists rather than an objective measurement of the pathologists. The accuracy of endoscopic polyps size estimation has previously been questioned by some reports that endoscopists tend to overestimate the size of colon polyps compared to more accurate pathology measurements [5,6].

In a retrospective study at the Mayo Clinic in Rochester of 222 colon polyps estimated as ≥ 1 cm on endoscopy, 46% were <1 cm on measurement by pathology (considering the latter as the standard), which marks a trend clear to endoscopically overestimate colon polyps [7]. There are also studies that compare the size of colon polyps by computed tomography colonography and endoscopy, also finding a tendency to overestimate the size of polyps by endoscopy [8].

In one study, the size of colon polyps was evaluated by endoscopy and pathology, the reference standard was the size measurement performed with a millimeter ruler by an independent examiner (who was different from endoscopists and pathologists) and he measured the polyps immediately after polypectomy, but before immersion in formalin fixation. The endoscopists used a visual estimation of the size of the polyps. The pathologists took their size measurements immediately upon removal of the formalin polyps before making the cuts. It was found that formalin fixation did not significantly affect the size of the polyps, and that endoscopist estimates of the size of the polyps were often unreliable (20% of the measurements differed from the reference standard by more than 3 mm, both underestimation as

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overestimation), and that pathological measurements of the size of the polyps were preferable [5].

In this study, we evaluated the disparity between endoscopic and pathology measures of colon polyps and also the factors that could be related to bias in endoscopic measurement.

## Materials and Methods

### Study design

A retrospective analysis of polyps detected by colonoscopy was carried out in a tertiary care center, in the period of time from June 2019 to April 2020. The main variables of interest were reviewed in the electronic file. The inclusion criteria were: polyps that were estimated by endoscopy and pathology of their size. The exclusion criteria were: polyps resected in the piecemeal, polyps whose size was not reported in endoscopy and pathology, incompletely resected polyps, inflammatory bowel disease, Lynch syndrome, familial adenomatous polyposis syndrome.

### Endoscopic examination

The colonoscopies were performed by 6 certified endoscopists and 8 endoscopy residents, when the colonoscopy was performed by a resident it was supervised by an endoscopist from the assigned staff. The Olympus CF-HQ190L endoscope (Olympus, Tokyo, Japan) was used. Endoscopic measurement methods were left to the decision of the endoscopist, regularly using biopsy forceps and visual estimation.

### Pathology exam

As a routine, polyps were placed in formalin immediately after polypectomy and sent for pathology examination, where a ruler was used and the size in Millimeters (mm) was reported. Measurement by pathology was considered the standard criterion for comparison, given its objective evaluation by metric rules.

### Statistic analysis

Demographic variables were analyzed, for study purposes it was divided into polyps <10 mm vs. ≥ 10 mm. Descriptive statistics were used. A univariate analysis was performed using Chi-square for difference in proportions and a value of P <0.05 was considered statistically significant. The statistical program SPSS V.22 was used.

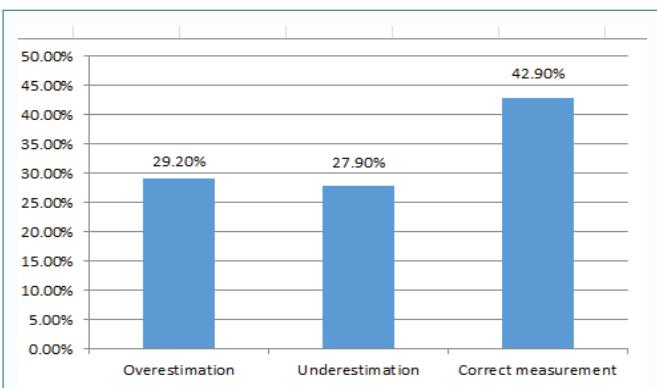
## Results

Of a total of 426 polyps, 193 polyps were excluded because they met exclusion criteria. 233 polyps were included for analysis, adenomas (68.7%), hyperplastic (29.6%) and serrated (1.7%) out of a total of 137 patients, male sex 50.6%, mean age 62.5 years. The mean size by pathology was 5.7 mm for the total number of polyps (Table 1).

**Table 1:** Patient characteristics and polyps.

|                               | Adenomas (160) | Serrated (4) | Hyperplastic (69) | Total (233) |
|-------------------------------|----------------|--------------|-------------------|-------------|
| Age(mean)                     | 64.1           | 61.7         | 58.8              | 62.5        |
| Sex: Male (%)                 | 92 (57.9)      | 2 (50)       | 24 (34.8)         | 118 (50.6%) |
| Polyp size by pathology ('mm) | 6.1            | 7.2          | 4                 | 5.7         |
| Localization n (%)            |                |              |                   |             |
| --Right colon                 | 74 (46.5)      | 3 (75)       | 36 (53.7)         | 114 (48.9)  |
| --Left colon                  | 73 (45.9)      | 0 (0)        | 20 (29.9)         | 94 (40.3)   |
| --Rectum                      | 12 (7.5)       | 1 (25)       | 11 (16.4)         | 25 (10.7)   |
| Morphology (%)                |                |              |                   |             |
| --Pedunculated                | 31 (19.5)      | 1 (25)       | 6 (9)             | 40 (17.2)   |
| --Sessile                     | 111 (69.8)     | 1 (25)       | 52 (77.6)         | 164 (70.4)  |
| --Flat/Depressed/Ulcerated    | 17 (10.7)      | 2 (50)       | 9 (13.4)          | 29 (12.4)   |

mm: Millimeters



**Figure 1:** Analysis of total polyps. A polyp was considered to be overestimated if the endoscopic estimate exceeded the corresponding pathological measurement and it was considered an underestimate if the endoscopic estimate fell below the pathological measurement.

We analyze the size of the total polyps taking as standard the measurement by pathology; we have a percentage of endoscopic overestimation of their size in a general 29.2% (Figure 1). When analyzing polyps ≥ 10 mm by endoscopy (44 polyps), 34.1% were <10 mm due to pathology. 188 polyps were considered <10 mm by endoscopy and of these, 4.2% were ≥10 mm due to pathology.

According to their morphology, there was a tendency to endoscopically overestimate the size more in pedunculates (45%), followed by sessile (31%) and depressed (25%) without reaching a statistically significant difference (P=0.096). No statistically significant differences were observed in the percentages of overestimation according to the following variables: sex (P=0.380), histology (P=0.119), and location of the polyp (P=0.651).

## Discussion

This study shows that there is a significant discrepancy between endoscopic measurements and pathology measurements, particularly in polyps ≥ 10 mm where their size was overestimated by 34.1%, while polyps <10 mm by endoscopy only 4.2% were greater than 10 mm in its measurement by pathology. In the univariate analysis, the identified factors that was significantly associated with the endoscopic overestimation of the polyp size included morphology (more in pedunculated compared to sessile and depressed polyps).

The estimation of the size of the polyps of course has very relevant implications, since the inaccuracy in the estimation of the size of the polyps is vital for the evaluation of the risk of CRC and the recommendations for the intervals of endoscopic surveillance [4].

According to the results of in this work, one third of the 10 mm polyps on colonoscopy were actually <10 mm on pathological measurement, so these patients would be inappropriately advised to undergo a more aggressive post-surveillance time interval surveillance. Although relying preferentially on the most objective pathological measurements would seem to be the logical solution, in real clinical practice this approach often does not allow as fragment polypectomy or incomplete polypectomy is common, and therefore only the endoscopic evaluation of the patient is recorded size of polyps. To further emphasize this point, pathological evaluations of full polyp size were available in only 40% of patients who underwent polypectomy, particularly for fragmentary or incomplete polypectomies, which is why it is of the utmost importance to make correct size estimates of polyps by endoscopy. Our findings are consistent with results from other centers, for example, in a retrospective study colon polyps estimated as  $\geq 10$  mm in endoscopy, 46% were <10 mm in measurement by pathology, which was considered the standard [7].

Assessing the size of polyps during colonoscopy is challenging. In clinical practice, the size of polyps can be approximated by visual estimation, comparison of the polyp size with open biopsy forceps spanning a known length, or the use of measurement tools. Visual estimation is the most widely used methodology in many centers, but it is a technique with great variability and prone to errors because it depends on the experience of the endoscopist, also due to the lack of a reference size for comparison and optical distortion light source and camera lens type. This technique has an error range of 6% to 62.6% according to previous studies according to the size of the polyps included and the definition of polyps of incorrect size [6,9].

Technical factors may have influenced the differences observed in the evaluation of the size of polyps between endoscopists and pathologists. However, it is unlikely that formalin fixation explained the observed differences as some previous studies have addressed the potential for shrinkage of polyps due to formalin fixation, showing no significant differences between measurements of fresh and formalin fixed polyps [5,10-13].

Our study has some limitations, it is a retrospective study and therefore has selection bias that we could not anticipate, and it is a study of a single reference center, so our results may not be completely generalizable to all populations. However our results are consistent with those published in different centers with a not inconsiderable overestimation of the size of the polyps [7,12]. It is important to mention that the different endoscopists did not report the exact measurement method, which would have contributed more information to our study.

## Conclusion

There is a high frequency of endoscopic errors when measuring the size of colon polyps, particularly the evident bias towards an overestimation of size, and this has important consequences on the more aggressive post-polypectomy surveillance intervals increasing costs, without a doubt Improving these results is a goal that all endoscopists must set ourselves to improve the quality of colonoscopy studies, we believe that developing new simple and more precise endoscopic measurement methods could be justified.

## References

- Bray F, Ferlay J, Soerjomataram I, Siegel R, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68(6):394-424.
- WHO. The Global Cancer Observatory. Colorectal cancer Source: Globocan 2018. 2018.
- Heitman SJ, Ronksley PE, Hilsden RJ, Manns BJ, Rostom A, Hemmelgrahn BR. Prevalence of adenomas and colorectal cancer in average risk individuals: a systematic review and meta-analysis. Clin Gastroenterol Hepatol. 2009;7(12):1272-8.
- Gupta S, Lieberman D, Anderson JC, Burke CA, Dominitz JA, Kaltenbach T, et al. Recommendations for Follow-Up After Colonoscopy and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer. Am J Gastroenterol. 2020;115(3):415-34.
- Schoen RE, Gerber LD, Margulies C. The pathologic measurement of polyp size is preferable to the endoscopic estimate. Gastrointest Endosc. 1997;46(6):492-6.
- Eichenseer PJ, Dhanekula R, Jakate S, Mobarhan S, Melson JE. Endoscopic mis-sizing of polyps changes colorectal cancer surveillance recommendations. Dis Colon Rectum. 2013;56(3):315-21.
- Anderson BW, Smyrk TC, Anderson KS, Mahoney DW, Devens ME, Sweetser SR, et al. Endoscopic overestimation of colorectal polyp size. Gastrointest Endosc. 2016;83(1):201-8.
- Summers RM. Polyp size measurement at CT colonography: What do we know and what do we need to know? Radiology. 2010;255(3):707-20.
- Gopalswamy N, Shenoy VN, Choudhry U, Markert RJ, Peace N, Bhutani MS, et al. Is in vivo measurement of size of polyps during colonoscopy accurate? Gastrointest Endosc. 1997;46(6):497-502.
- Moug SJ, Vernall N, Saldanha J, McGregor JR, Balsitis M, Diament RH. Endoscopists' estimation of size should not determine surveillance of colonic polyps. Colorectal Dis. 2010;12(7):646-50.
- Morales TG, Sampliner RE, Garewal HS, Fennerty MB, Aickin M. The difference in colon polyp size before and after removal. Gastrointest Endosc. 1996;43(1):25-8.
- Pham T, Bajaj A, Berberi L, Hu C, Taleban S. Mis-sizing of adenomatous polyps is common among endoscopists and impacts colorectal cancer screening recommendations. Clin Endosc. 2018;51(5):485-90.
- Levene Y, Hutchinson JM, Tinkler-Hundal E, Quirke P, West NP. The correlation between endoscopic and histopathological measurements in colorectal polyps. Histopathology. 2015;66(4):485-90.