https://www.scientificarchives.com/journal/journal-of-experimental-pathology

Journal of Experimental Pathology Commentary

Colonoscopy Audit Increases Detection of Sessile Serrated Polyps

Alan Gordon Fraser*

Medicine, Faculty of Medical and Health Sciences, The University of Auckland, Auckland, New Zealand

*Correspondence should be addressed to Alan Gordon Fraser; a.fraser@auckland.ac.nz

Received date: November 05, 2021, **Accepted date:** December 14, 2021

Detection and removal of all adenomas at colonoscopy is associated with a reduced interval cancer rate [1,2]. This is consistent with the adenoma-carcinoma sequence for colorectal cancer. The identification of the serrated polyp cancer pathway has emphasized the importance of detection and removal of sessile serrated polyps. Serrated polyps are precursor lesions accounting for 15% to 30% of colorectal cancers. They are overrepresented as a cause of interval cancers [3]. The detection of serrated polyps has been clearly linked to the risk of colorectal cancer in a prospective record linkage study in Sweden with a similar risk to tubular adenomas (HR of 1·77 (1·34-2·34) for sessile serrated polyps and 1·41 (1·30-1·52) for tubular adenomas) [4].

The reported prevalence of sessile serrated polyps on routine colonoscopy or screening colonoscopy has been variable with an overall prevalence of 4.6% in a recent meta-analysis of 74 colonoscopy studies [5]. The actual prevalence may be higher with careful colonoscopy and training to detect these lesions. The detection rate for sessile serrated polyps has not been part of most colonoscopy audits. These polyps are more subtle and therefore more difficult to identify at colonoscopy. The skill to reliably detect these polyps may be a separate learning process [6]. Many studies have focused on technical aspects that could help improve the detection of polyps including the potential impact of high definition endoscopy, chromoendoscopy, narrow-band imaging, and most recently artificial intelligence (AI). It is likely that these technical aspects have differing effects on detection of adenomas and serrated polyps. In one study, the adenoma detection rate (ADR) was significantly higher in the AI group than in the control group (26.4% vs 19.9%) but there was no change in the detection of sessile serrated polyps [7].

Audit with appropriate feedback is an established method of improving quality in healthcare. This process has been validated in the surgical literature with improvements demonstrated in mortality and infection rates [8]. The quality of a service or endoscopy unit depends on all endoscopists consistently performing to a high standard. Audit with feedback combined with training programs can gradually improve technical skills, particularly in low-performing endoscopists. Non-technical skills such as attitude, decision making, and judgment may improve more quickly but could also regress after completion of a short-term audit. There is minimal data on the type of feedback required to improve performance indicators and few studies have looked at performance once the audit is discontinued.

The withdrawal time of greater than 6 mins was the first measure of performance to be studied. Longer withdrawal times, encouraged by an audit process, can increase the overall polyp detection rate and also adenoma detection rate [9-12]. The effect of increasing withdrawal time on the detection of sessile serrated polyps has been less well studied [13].

The polyp detection rate is clearly an important indicator of quality but the important question is whether the overall polypectomy rate is sufficient or whether specific detail on adenoma detection and sessile serrated polyp detection is required [14]. Our single-center study collected audit data from 2004 – 2020 [15]. The feedback was relatively informal with 6-monthly meetings of the endoscopists. A detailed written summary was given to endoscopists. The overall performance of the unit was discussed with endoscopists able to compare their results directly with other endoscopists in an open forum.

Audit data taken over a long period enables analysis of trends including the possible waning of effect over time. The overall polyp detection rate increased from 40.7% to 62.2%. The adenoma detection rate also increased from 25.8% to 28.3%. The most significant change was an increase in the detection of sessile serrated polyps from 4.5% to 14.7%.

This study confirms a durable effect from the audit process. Feedback on specific types of polyps was found to be very

helpful and was likely to be an important factor in improving the detection of sessile serrated polyps. Simply relying on polypectomy rate as a marker of performance is not adequate and can encourage increased removal of diminutive and small hyperplastic polyps [16,17].

The beneficial effect of colonoscopy audit has been confirmed in other studies. Annual feedback has been shown to be sufficient to improve the performance of those endoscopists below an acceptable level of polyp detection [18]. The proportion of endoscopists with an acceptable ADR increased from 8.1% to 31.0%. Feedback using a report card every 3 months over 2 years increased ADR from 44.7% to 53.9% [19]. There have been a small number of randomized studies. One single-center study showed that two teaching sessions and monthly feedback increased ADR from 36% to 47% [20]. A multi-center trial of the same intervention showed a significant increase in ADR at the training sites (31% to 42%). In contrast to the single-center study, the ADR also increased at the control sites (from 36% to 39%). The authors concluded that there was a positive effect from training and audit but that the effect size was small [21]. Another randomized trial showed that two specific training sessions improved the detection rate for sessile serrated polyps from 9.3% to 15.6% [22]. There have been at least three attempts at a meta-analysis of audit trials [23-25]. One review showed that ADR improved from a baseline of 30.5% to 36% [23]. Another meta-analysis of 12 studies (3 RCTs) showed a significant improvement in ADR after feedback compared to no feedback (36% vs. 27%). This study divided feedback into two groups: *active* defined as hands-on training or individualized instruction and *passive* which included only performance cards [24]. There was no difference between active and passive feedback. The third meta-analysis focussed on studies that used a focussed training intervention [25]. Only 3 trials could be identified and the effect was disappointingly modest (OR 1.16 (1.00-1.34) [18,21,26]. The most intensive audit process involves the review of videos of colonoscopies. One study of 130 videos from 9 endoscopists showed that inspection behind folds and careful inspection of caecum highly correlated with detection of polyps [27]. This study was not strictly audit but the detailed feedback available would be invaluable to change practice in specific ways that have been shown to make a difference. Computed-aided learning is another approach to improving performance. This provides immediate feedback to the endoscopist on the detection of polyps and potentially highlights where polyps may have been missed [28]. A comprehensive training program is an integral part of audit. A recent Norwegian study compared 11 centres participating in "train the trainer" courses compared with 11 non-particpating centres. The polyp detection rate increased in participating centres from 30.8% to 37.9% compared with no change in non-particpating centres [29].

It has to be accepted that the improvements in performance demonstrated in our long-term study could have occurred in the absence of the audit process. General improvements may occur with experience and with informal discussions between endoscopists on how to improve performance. Improvement in equipment may lead to higher completion rates and better visualization of the complete mucosal area with higher resolution scopes. The process of data collection alone may be enough to encourage improved performance. Data on over 2.5 million colonoscopies were submitted to a GI Quality Improvement Consortium from 2014 to 2018. There was a significant increase in ADR from 33.9% to 38.1% [30].

The goal of colonoscopy and polypectomy is to reduce the incidence of colorectal cancer. This can be tested in long-term follow-up studies of surveillance colonoscopy. A large retrospective study has shown that the overall rate of interval colorectal cancer decreased from 0.15% to 0.08% after the initiation of regular feedback with educational meetings [31].

ADR is now established as an important aspect of colonoscopy audit because a low ADR has been shown to be associated with higher rates of interval colorectal cancer. An improved ADR can be achieved by audit. This has been shown to lead to a decreased rate of incidence of cancers. Our study demonstrated that continuous colonoscopy audit with histology had the most impact on sessile serrated polyp detection. Large-scale studies will be required to show whether higher detection rates for sessile serrated polyps will have the same effect on interval cancers.

References

1. Kaminski MF, Wieszczy P, Rupinski M, Wojciechowska U, Didkowska J, Kraszewska E, et al. Increased rate of adenoma detection associates with reduced risk of colorectal cancer and death. Gastroenterology. 2017 Jul 1;153(1):98-105.

2. Corley DA, Jensen CD, Marks AR, Zhao WK, Lee JK, Doubeni CA, et al. Adenoma detection rate and risk of colorectal cancer and death. New England Journal of Medicine. 2014 Apr 3;370(14):1298-306.

3. Meester RG, Ladabaum U. Sessile serrated polyps and colorectal cancer mortality. Lancet Gastroenterology and Hepatology. 2020 Jun 1;5(6):516-7.

4. Song M, Emilsson L, Bozorg SR, Nguyen LH, Joshi AD, Staller K, et al. Risk of colorectal cancer incidence and mortality after polypectomy: a Swedish record-linkage study. The Lancet Gastroenterology and Hepatology. 2020 Jun 1;5(6):537-47.

5. Meester RG, van Herk MM, Lansdorp-Vogelaar I, Ladabaum U. Prevalence and clinical features of sessile serrated polyps: a systematic review. Gastroenterology. 2020 Jul 1;159(1):105-18.

6. Bronzwaer ME, Vleugels JL, van Doorn SC, Dijkgraaf MG, Fockens P, Dekker E, et al. Are adenoma and serrated polyp detection rates correlated with endoscopists' sensitivity of optical diagnosis. Endoscopy. 2020 Sep;52(09):763-72.

7. Hassan C, Spadaccini M, Iannone A, Maselli R, Jovani M,

Chandrasekar VT, et al. Performance of artificial intelligence in colonoscopy for adenoma and polyp detection: a systematic review and meta-analysis. Gastrointestinal Endoscopy. 2021 Jan 1;93(1):77-85.

8. Maruthappu M, Trehan A, Barnett-Vanes A, McCulloch P, Carty MJ. The impact of feedback of surgical outcome data on surgical performance: a systematic review. World Journal of Surgery. 2015 Apr;39(4):879-89.

9. Bhurwal A, Rattan P, Sarkar A, Patel A, Haroon S, Gjeorgjievski M, et al. A comparison of 9-min colonoscopy withdrawal time and 6-min colonoscopy withdrawal time: A systematic review and meta-analysis. Journal of Gastroenterology and Hepatology. 2021 Oct 18.

10. Fraser AG, Gamble GD, Rose TR, Dunn JP. Colonoscopy audit over 10 years--what can be learnt?. The New Zealand Medical Journal (Online). 2013 Sep 13;126(1382):25-35.

11. Lee TJ, Blanks RG, Rees CJ, Wright KC, Nickerson C, Moss SM, et al. Longer mean colonoscopy withdrawal time is associated with increased adenoma detection: evidence from the Bowel Cancer Screening Programme in England. Endoscopy. 2013Jan;45(01):20-6.

12. Vavricka SR, Sulz MC, Degen L, Rechner R, Manz M, Biedermann L, et al. Monitoring colonoscopy withdrawal time significantly improves the adenoma detection rate and the performance of endoscopists. Endoscopy. 2016 Mar;48(03):256-62.

13. Butterly L, Robinson CM, Anderson J, Weiss JE, Goodrich M, Onega TL, et al. Serrated and adenomatous polyp detection increases with longer withdrawal time: results from the New Hampshire Colonoscopy Registry. The American Journal of Gastroenterology. 2014 Mar;109(3):417-26.

14. Abou Ali E, Barret M. How to Measure Detection Rate During Colonoscopy: PDR, ADR, SDR, or All Three?. Current Treatment Options in Gastroenterology. 2021 Feb 25:266-276.

15. Fraser AG, Rose T, Wong P, Lane M, Frankish P. Improved detection of adenomas and sessile serrated polyps is maintained with continuous audit of colonoscopy. BMJ Open Gastroenterology. 2020 Jul 1;7(1):e000425.

16. Murchie B, Tandon K, Zackria S, Wexner SD, O'Rourke C, Castro FJ. Can polyp detection rate be used prospectively as a marker of adenoma detection rate?. Surgical Endoscopy. 2018 Mar;32(3):1141-8.

17. Pu LZ, Singh G, Rana K, Nakamura M, Yamamura T, Krishnamurthi S et al. Polyp detection rate as a surrogate for adenoma and sessile serrated adenoma/polyp detection rates. Gastrointestinal Tumors. 2020;7(3):74-82.

18. Kaminski MF, Anderson J, Valori R, Kraszewska E, Rupinski M, Pachlewski J, et al. Leadership training to improve adenoma detection rate in screening colonoscopy: a randomised trial. Gut. 2016 Apr 1;65(4):616-24.

19. Kahi CJ, Ballard D, Shah AS, Mears R, Johnson CS. Impact of a quarterly report card on colonoscopy quality measures. Gastrointestinal Endoscopy. 2013 Jun 1;77(6):925-31.

20. Ussui V, Coe S, Rizk C, Crook JE, Diehl NN, Wallace MB. Stability of increased adenoma detection at colonoscopy. Follow-up of an endoscopic quality improvement program-EQUIP-II. Official Journal of the American College of Gastroenterology| ACG. 2015 Apr 1;110(4):489-96.

21. Wallace MB, Crook JE, Thomas CS, Staggs E, Parker L, Rex DK. Effect of an endoscopic quality improvement program on adenoma detection rates: a multicenter cluster-randomized controlled trial in a clinical practice setting (EQUIP-3). Gastrointestinal Endoscopy. 2017 Mar 1;85(3):538-45.

22. Bleijenberg AG, van Leerdam ME, Bargeman M, Koornstra JJ, van Herwaarden YJ, Spaander MC, et al. Substantial and sustained improvement of serrated polyp detection after a simple educational intervention: results from a prospective controlled trial. Gut. 2020 Dec 1;69(12):2150-8.

23. Bishay K, Causada-Calo N, Scaffidi MA, Walsh CM, Anderson JT, Rostom A, et al. Associations between endoscopist feedback and improvements in colonoscopy quality indicators: a systematic review and meta-analysis. Gastrointestinal Endoscopy. 2020 Nov 1;92(5):1030-40.

24. Boregowda U, Desai M, Nutalapati V, Paleti S, Olyaee M, Rastogi A. Impact of feedback on adenoma detection rate: a systematic review and meta-analysis. Annals of Gastroenterology. 2021;34(2):214.

25. Lim S, Hammond S, Park J, Hochman D, Le ML, Rabbani R, et al. Training interventions to improve adenoma detection rates during colonoscopy: a systematic review and meta-analysis. Surgical Endoscopy. 2020 Sep;34(9):3870-82.

26. Coe SG, Crook JE, Diehl NN, Wallace MB. An endoscopic quality improvement program improves detection of colorectal adenomas. Official Journal of the American College of Gastroenterology| ACG. 2013 Feb 1;108(2):219-26.

27. Yang SY, Quan SY, Friedland S, Pan JY. Predictive factors for adenoma detection rates: a video study of endoscopist practices. Endoscopy International Open. 2021 Feb;9(02):E216-23.

28. Wang P, Liu X, Berzin TM, Brown JR, Liu P, Zhou C, et al. Effect of a deep-learning computer-aided detection system on adenoma detection during colonoscopy (CADe-DB trial): a double-blind randomised study. The Lancet Gastroenterology and Hepatology. 2020 Apr 1;5(4):343-51.

29. Hoff G, Botteri E, Huppertz-Hauss G, Kvamme JM, Holme Ø, Aabakken L, et al. The effect of train-the-colonoscopy-trainer course on colonoscopy quality indicators. Endoscopy. 2021 Feb 23:1229-34.

30. Shaukat A, Holub J, Pike IM, Pochapin M, Greenwald D, Schmitt C, et al. Benchmarking Adenoma Detection Rates for Colonoscopy: Results From a US-Based Registry. Official Journal of the American College of Gastroenterology. 2021 Jun 24:10-4309.

31. Lam AY, Li Y, Gregory DL, Prinz J, O'Reilly J, Manka M, et al. Association between improved adenoma detection rates and interval colorectal cancer rates after a quality improvement program. Gastrointestinal Endoscopy. 2020 Aug 1;92(2):355-64.