Smoking status and outcomes after colorectal cancer surgery in an Australian cohort

Current smokers reach surgery younger, more urgently and with more stomas; adjusted outcomes were not significantly different

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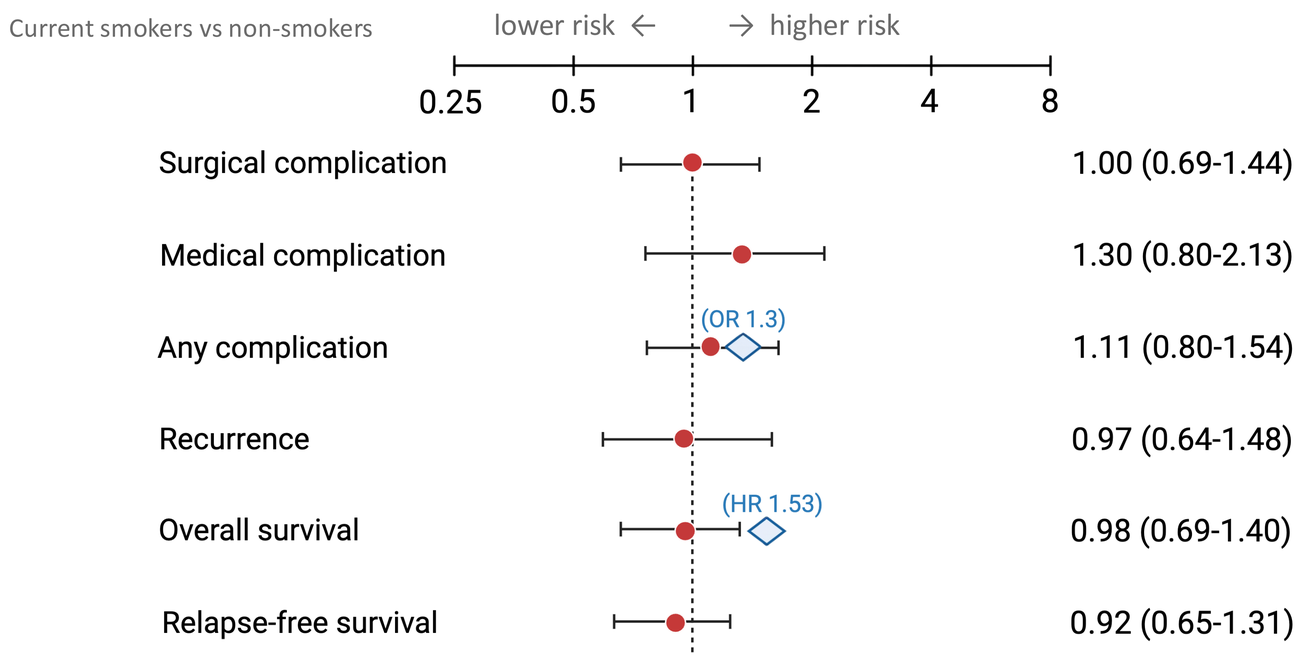
BACKGROUND

Smoking increases colorectal cancer risk, and larger studies link it to more complications[1] and anastomotic leak[2] after surgery. Smokers may also reach surgery younger, more often as emergencies, and by a different operative route, which could mask differences in outcomes. Surgeons may also adapt operations to perceived risk.

METHODS

Retrospective cohort of 3,776 patients in the Cabrini–Monash database (CMCND) who underwent CRC surgery between 2010 and 2022: 2,042 non-smokers, 1,478 ex-smokers, 256 current smokers. Logistic and Cox models adjusted for age, sex, ASA, comorbidities, urgency, screen detection, tumour site and stage. Route to surgery was compared across all groups.

Adjusted outcomes: no significant difference



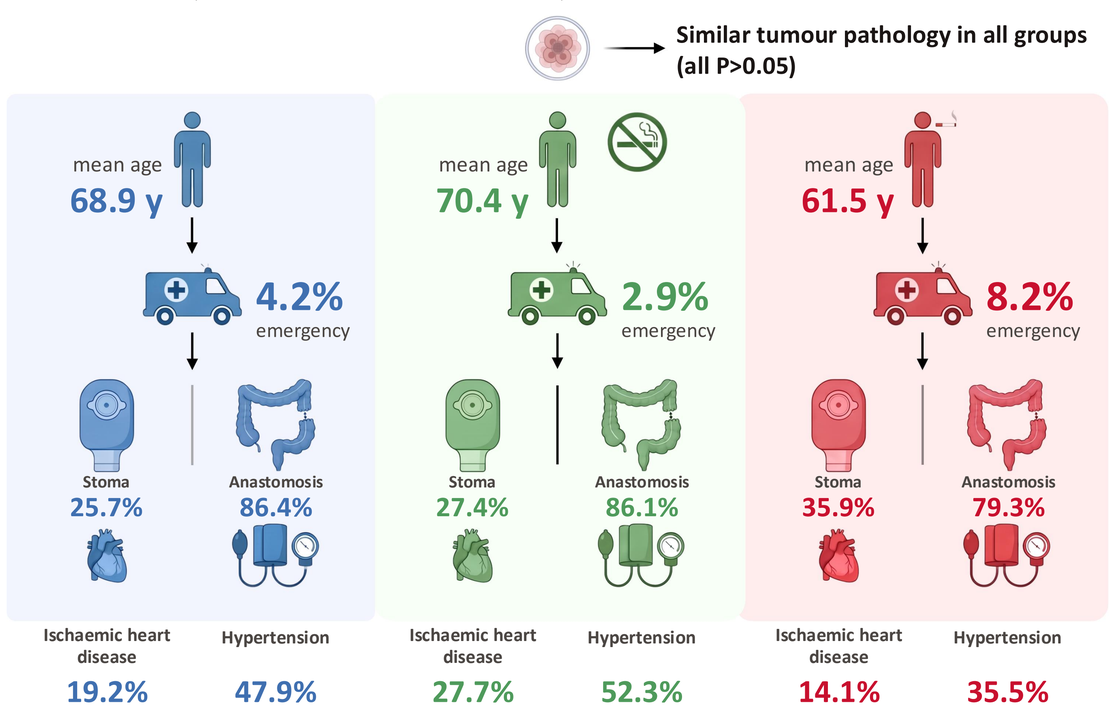
Adjusted odds ratios (OR) and hazard ratios (HR), 95% confidence intervals, log scale. Every interval includes 1. Blue diamonds: larger studies. Any complication: NSQIP morbidity OR 1.3[1]. Overall survival: pooled HR 1.53 in stage I–III disease[3], above our interval.

Among 3,776 patients undergoing colorectal cancer surgery, current smokers were younger and had a different comorbidity, urgency and operative profile. Smoking status was not independently associated with measured perioperative complications, chemotherapy, recurrence, overall survival or relapse-free survival, and no interaction survived Benjamini–Hochberg correction.

These findings are compatible with harms reported in larger cohorts and do not establish equivalence or a protective effect of smoking. Differences in presentation and operative route may contribute to this pattern

How smokers reach surgery

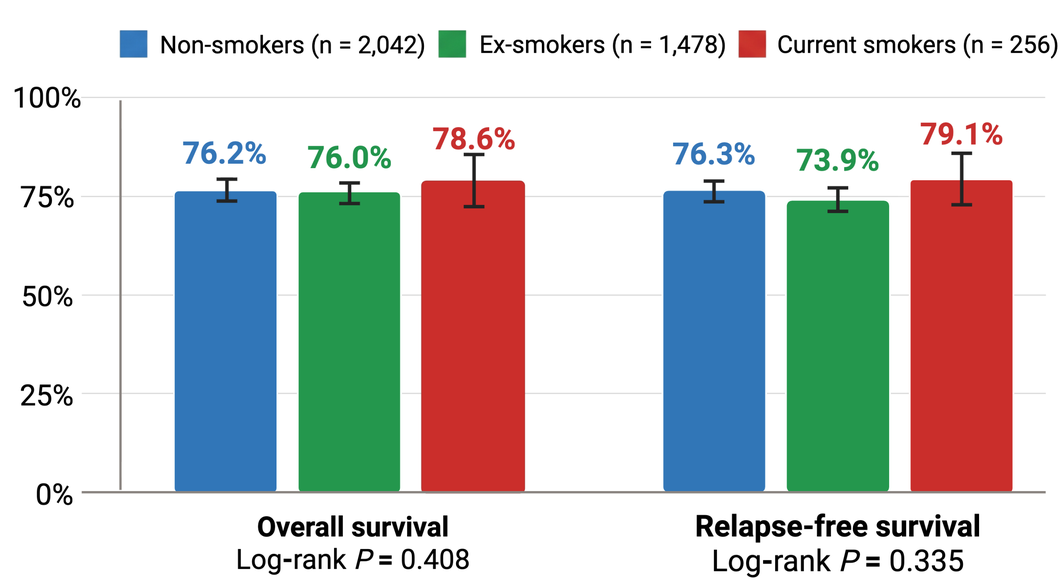
Unadjusted comparisons between the three groups



Tests across the three groups: emergency P<0.001; stoma P=0.002; anastomosis P=0.008; ischaemic heart disease and hypertension P<0.001. Unadjusted. Stoma and anastomosis are separate comparisons, so they do not sum to 100%. Source: manuscript Table 2, Tables S1 and S16.

Crude 5-year survival

Kaplan–Meier estimates, unadjusted



Crude Kaplan-Meier estimates at 5 years; error bars are 95% confidence intervals. Observed median follow-up about 2-2.5 years

WHY HARM MAY BE HARD TO SEE

The first reason is shown by our intervals. The others are possible explanations that this study did not test.

1 Few smokers

Only 256 current smokers. For complications, our interval includes the harm seen in a large national database[1]. For survival, the pooled estimate lies just above our interval.

2 Younger patients

Current smokers were 7–9 years younger. Age strongly affects outcome, so unadjusted comparisons can mislead.

3 Operations may adapt to risk

Smokers more often had a stoma (35.9% vs 25.7%), but the reason was not recorded. In a rectal cancer series without protective stomas, leak was 9.3% in current smokers vs 3.3% in non-smokers[4]

CONCLUSION

Smoking-related harm may be hidden by who reaches surgery and how they are operated on, and our data cannot exclude some harm. Prevention, cessation and screening remain priorities.

References: 1 Sharma A, et al. Ann Surg 2013;258:296–300. 2 Parthasarathy M, et al. Colorectal Dis 2017;19:288–298. 3 Alwers E, et al. JNCI Cancer Spectr 2021;5:pkab077. 4 Tsai KY, et al. Langenbecks Arch Surg 2022;407:1131–1138.

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