

Analysis of colonic configurations and their relevance to colonoscopy

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Colonoscopy is a common endoscopic imaging technique that plays an important role in the screening, diagnosis and treatment of colorectal pathology. Complete visualisation of the colon occurs only if the scope tip has intubated the caecum. In some patients, increased mobility of segments of the colon leads to the formation of tortuous loops, which require complex reduction manoeuvres in order to permit further retrograde passage of the scope. These challenging colonic loops limit the clinical effectiveness of colonoscopy as they are an important cause of its incompleteness. Our studies examined the relevance of colonic configurations to colonoscopy.

The first strand of our work used magnetic ScopeGuide™ imaging to visualise real-time scope configurations during 103 colonoscopies carried out by a single expert operator. Analysis of the images led to novel definitions for morphologically distinct looping patterns in both sigmoid and transverse colonic segments. Sigmoid n-shaped loops and deep transverse loops were more common in females; furthermore, patients with deep transverse loops were more likely to have a sigmoid n- or alpha-loop. This preponderance of difficult looping patterns in females might explain why colonoscopy is more difficult in this group. Nevertheless, no particular combination of sigmoid and transverse configurations predicted time taken to complete colonoscopy, which possibly reflects the experience of the operator in resolving loops.

The second strand of our work used novel definitions to describe the mobility of sigmoid and transverse loops in the undisturbed abdomens of 122 cadaveric subjects. There was a strong correlation between sigmoid and transverse colonic mobility and females had a more mobile transverse segment; these results are consistent with the findings of the colonoscopic data. Further investigation is required to identify how difficult loops occur during colonoscopy and the anatomical factors that underpin them. We acknowledge the generosity of the donors without whom this study would be impossible.