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Indocyanine Green Tattoo in Localising Low Rectal Lesions and Intracorporeal Anastomosis

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Introduction

We present an alternative technique to traditional endoscopic tattooing for localising rectal tumours, with intra-operative use of Indocyanine Green (ICG) delivered endoscopically.

Case Background

A 50 year-old female presented to our regional service for a robotic high anterior resection following colonoscopy suggesting a lesion 13-16cm from the anal verge. CT staging could not visualise the lesion with no metastatic disease. During the operation, the tumour was identified lower than reported at about 5cm from anal verge, necessitating an intracorporeal ultra-low anterior resection.

Technique

1. TME dissection, preparation for rectal division.
2. Tumour localisation via flexible sigmoidoscopy **(Fig. A).**
3. Preparation of endoscopic ICG and drawing up to endoscopic tattoo syringe.
4. In Firefly™ near-infrared vision, injection of ICG Tattoo into anterior wall of rectum 10mm distal from tumour (away from mesorectum). To reduce ICG diffusion, a maximum 1.5mL volume was infiltrated in TME dissection phase only **(Fig. B, C).**
5. Ultralow distal resection performed using a SureForm™ green 60mm stapler following localisation **(Fig. D-H).**
6. Perfusion check of conduit with intravenous ICG administration, visibly distinct from intramucosal tattoo ICG.
7. Formation of intracorporeal, side-to-end (Baker type) anastomosis **(Fig. I).**
8. Flexible sigmoidoscopy confirmed negative leak test and widely patent anastomosis.

Outcome

The patient recovered without complication, discharged on day 3. Final histology: T2N0 adenocarcinoma, no nodal disease.

Conclusion

ICG tattooing combined with the intravenous administration enabled reliable localisation and perfusion assessment during robotic ultra-low anterior resection. This dual approach is a practical adjunct to support complex rectal surgery.

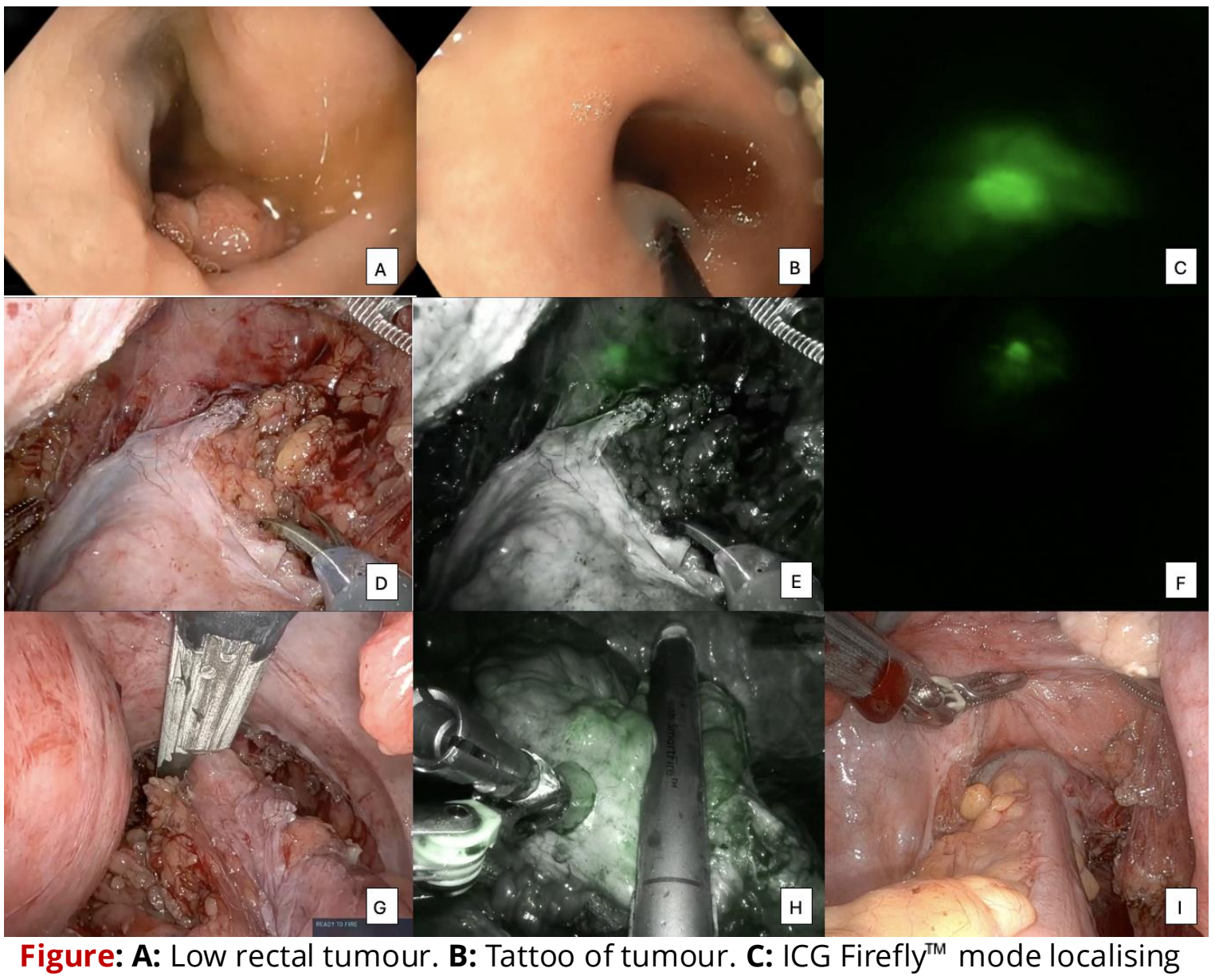

Figure: A: Low rectal tumour. **B:** Tattoo of tumour. **C:** ICG Firefly™ mode localising tumour location. **D-F:** Operative images showing ICG localisation from near infrared **(E)** and infrared **(F)** modes. **G:** Rectal transection. **H:** Proximal division with anvil placed and ICG perfusion test. I: Creation of Baker type anastomosis.