
## INTRODUCTION

- **Important role of the localization techniques**
  - Accurate laparoscopic localization of lesions / former polypectomy sites is often challenging
  - 10%-20% of endoscopic tumor locations are inconsistent with the intraoperative tumor site
    - Risk of removal of the wrong colonic segment

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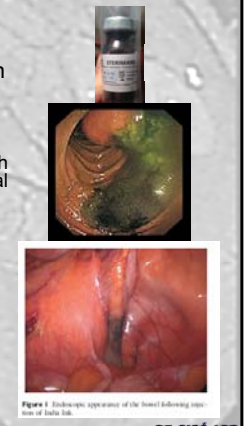
## AVAILABLE TECHNIQUES

- **Tattooing/staining**
  - India ink = black drawing ink made with carbon particles
    - Used generally in a 1:50 to 1:100 dilution
    - Sterilized suspension vs unsterilized
    - India ink contains other compounds which may cause inflammatory reactions in local tissue
  - Most commonly used
  - Stain lasts up to 22 years
    - Methylene blue, indigo carmine and indocyanine green: relatively short time span
  - Seems simplest, safest and most effective method



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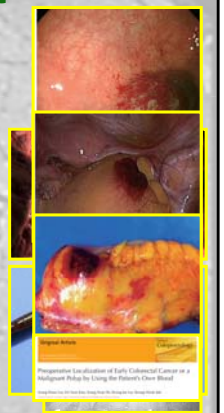
## AVAILABLE TECHNIQUES

- **Intra-operative colonoscopy**
  - May hamper laparoscopic handling due to insufflation
- **CT colonography**
- **Clips**
  - Short-term solution (clip migration)
  - Intraoperative fluoroscopy or US
- **Clipping of a tic ring marker next t mor**
- **Using the pat wn blood**



*There are no stu ng endoscopic tattooing with these alternative methods of localisation*

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## STANDARDISATION OF COLONIC TATTOOING

- **Eliminate unnecessary costs**
  - Less repeated diagnostic interventions and prolonged surgical procedures
- **Two-step (saline-test) injection method (injection of saline to form a submucosal bleb)**
- **Fu KI et al. Endoscopy (2001): conventional vs. two-step injection technique**
  - Conventional technique: correct in 31/36 cases (86.1 %)
  - Two-step technique: correct in 54/55 cases (98 %) (p = 0.034)

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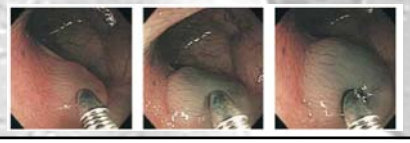
## HOW TO TATTOO

- **The saline-test method:**
  - Injection of 1 to 3 cc of saline into the submucosal layer
  - Insertion at an oblique angle to the bowel wall to avoid penetrating the serosa
  - Injection of 0,5 cc to 1,5 cc of India ink
  - Flushing needle with 2 cc of saline



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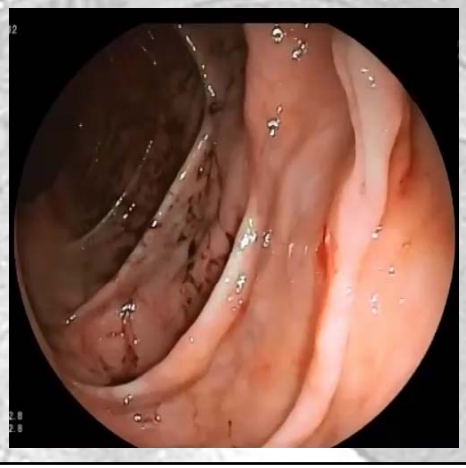

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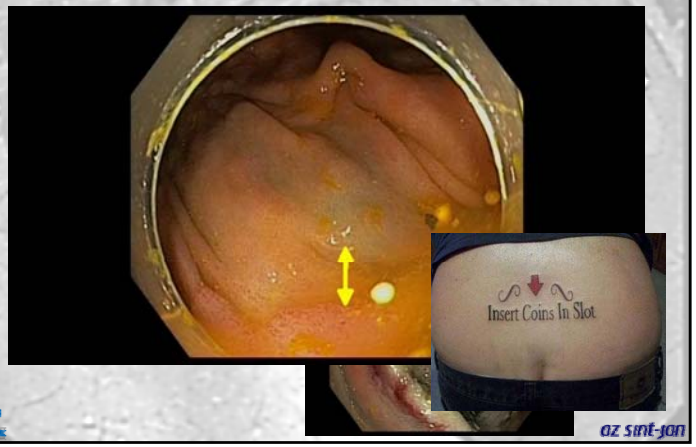
## WHERE TO TATTOO

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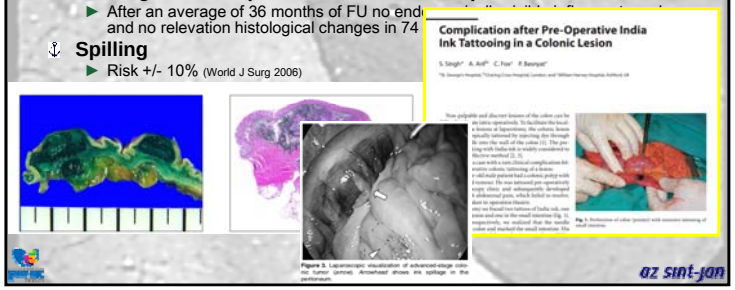
## POSSIBLE RISKS / SAFETY

- **Clinical relevant complications < 1%** (AJG 1996 / GIE 2010)
  - Complications not per se related to the India ink itself, but also to organic and inorganic compounds as cause of inflammatory responses
    - Inflammatory pseudotumor with perivisceral fat necrosis
    - Infection (abscess)
    - Perforation
- **No long-term complications have been reported** (GIE 2010)
  - After an average of 36 months of FU no end… and no relevation histological changes in 74
- **Spilling**
  - Risk +/- 10% (World J Surg 2006)

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## PREVENTION COMPLICATIONS

- **Using a sterile dilute suspensions of pure carbon?**
- **Using small volumes**
  - Aliquots of 0,1 to 2 cc
  - Higher volumes: higher risk of spillage & complications
- **Avoid deep injection**
  - Needle length
  - Oblique angle
  - Saline-test method

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## WHICH LESIONS (DO NOT) NEED TATTOOING

- **Caecum and ileocaecal valve?**
- **Rectum (< 12cm from the anal verge)?**
- **Tattoo any worrisome lesion that might require further intervention, with no particular recommendations relative to the size of the lesion**

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