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Decreasing leak rate in colorectal surgery using near infra-red (NIR) imaging: a multicentric prospective phase II studyF. Ris¹, R. Kraus², N. Buchs^{1,2}, C. Cunningham², R. Guy², O. Jones²,P. Mörel¹, R. Cahill³, N. Mortensen² & R. Hompes²¹Geneva University Hospitals, Geneva, Switzerland, ²Oxford University Hospitals, Oxford, UK, ³University College Dublin, Dublin, Ireland

Aim: Anastomotic leak is a devastating complication of colorectal surgery. We described recently the feasibility of microvascularisation assessment with near-infrared technology (NIR). We present the implementation of this technique in a prospective phase II series of patients undergoing colorectal resection.

Method: Multicentric prospective study of patients undergoing colonic resection. After vessel division and after colorectal anastomosis, indocyanine green was injected intravenously and anastomotic microvascularisation assessed.

Results: 243 procedures have been performed so far, mainly for cancer ($n = 161$), Crohn's (22), ulcerative colitis (7), 42 for complicated diverticular disease and 11 for other indications. 90 high anterior resection were performed, 51 low anterior resection, 7 pouches, two IRA, 62 right hemicolectomy, 15 Hartman's reversal and 18 others. Median time of ICG circulation to reach the anastomosis was 30 seconds and the median added time was of 4 minutes. The perfusion was satisfactory in every patient. There was a change of attitude in 15 cases (6.1%). Only 7 postoperative leaks occurred during the study period (2.8%).

Conclusion: NIR Laparoscopy with ICG perfusion imaging allows a rapid assessment of the anastomosis. This study shows that this technology offers the patient a safe and reliable anastomosis assessment tool as well as a change of attitude in 6% of the procedures.

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The effects of perioperative non-steroidal anti-inflammatory drugs (NSAIDs) in major gastrointestinal surgery: A multicentre, prospective cohort study

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Aim: Non-steroidal anti-inflammatory drugs (NSAIDs) can provide opiate-sparing post-operative analgesia, although safety concerns remain. This study investigated their use in major GI surgery.

Method: Multicentre, prospective, observational cohort study of consecutive patients undergoing elective or emergency GI surgery, with a minimum one night stay (September – November 2014). The primary outcome measure was the postoperative complication rate defined by Clavien-Dindo scale. NSAID use within first three days after surgery was recorded. Effects on complications were estimated using multivariable logistic regression to produce adjusted odds ratios (OR) and 95% confidence intervals.

Results: From 9267 patients, 2213 (23.9%) received perioperative NSAIDs and 7053 (76.1%) did not. At univariate level, NSAIDs were significantly associated with reduced complications (29.4% with NSAID vs. 40.5% without, OR 0.61, 0.55–0.68), which remained after risk adjustment (adjusted OR 0.80, 0.71–0.89). NSAIDs were not associated with increased anastomotic leak (3.6% vs. 4.1%, OR 0.81, 0.36–1.69) or acute kidney injury (1.3% vs. 2.7%, adjusted OR 0.71, 0.44–1.10).

Conclusion: At population level and after risk adjustment, early NSAIDs were not associated with increased post-operative complications and may have a beneficial safety effect. This observational data allows design of a randomised trial that can better assess safety and efficacy.

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The Stockholm III Trial on different radiotherapy regimens and timing to surgery in patients with rectal cancer - long term follow upJ. Erlandsson¹, T. Holm¹, L. Pahlman², D. Pettersson¹, F. Hjern¹, I. Syk⁴, O. Hallböök³, B. Glimelius¹ & A. Martling¹¹Karolinska Institutet, Stockholm, Sweden, ²Uppsala University, Uppsala, Sweden,³Linköping University, Linköping, Sweden, ⁴Malmö/lund University, Malmö, Sweden

Aim: To improve outcome in patients with rectal cancer by comparing different courses of preoperative radiotherapy (RT) and timing to surgery.

Method: Randomised controlled multicentre trial. 840 patients planned for abdominal surgery were randomised between:

- 1 Preoperative RT 5 × 5 Gy, surgery within one week (SRT)
- 2 Preoperative RT 5 × 5 Gy, surgery after 4–8 w (SRT-delay)
- 3 Preoperative RT 25 × 2 Gy, surgery after 4–8 w (LRT)

Primary outcome was time to local recurrence, secondary outcomes were radiation toxicity, postoperative complications, metastases and survival. Patients were followed within the Swedish Colorectal Cancer Registry. All results were analysed with intention to treat. Follow-up time was minimum 2 years.

Results: A total of 357,355 and 128 patients were randomised to SRT, SRT-delay and LRT respectively. Severe radiation toxicity was 6.5% (SRT-delay), 4.7% (LRT), ns. Surgical postoperative complications were 35.7% (SRT), 28.0% (SRT-delay), 23.6% (LRT) $P = 0.014$. The local recurrence rate were 2.0% (SRT), 2.8% (SRT-delay), 4.7% (LRT), $P = 0.267$. The rate of metastases was 21.6% (SRT), 21.1% (SRT-delay), 25.1% (LRT), $P = 0.649$. There were no significant differences in time to local recurrences or metastases between the arms. 2-year disease free survival was 81.6% (95%CI 77.1–85.3), 81.3% (76.8–85.0) and 75.2% (66.7–81.9) $P = 0.27$, in SRT, SRT-delay and LRT respectively

Conclusion: SRT-delay gives less postoperative complications and equal oncologic result compared to SRT and LRT.

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Procalcitonin and C-reactive protein as early predictors of anastomotic leakage after low anterior resection

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Aim: To evaluate procalcitonin (PCT) and C-reactive protein (CRP) as predictors of early anastomotic leakage.

Method: A prospective study of patients undergoing total mesorectal excision and stapled end-to-end or side-to-side anastomosis with defunctioning stoma was performed in all cases. The levels of PCT and CRP were measured at the 3rd and 6th post-operative day (POD). All patients were examined with contrast enema (Ultravist) at the 7th POD.

Results: There were 73 patients (34 male) with median age 61.8 years. Anastomotic leak rate was 16/73 (22%). Six leaks (8.3%) were diagnosed clinically and 10 (13.7%) radiographically. Patients with anastomotic leakage had significantly higher median level of CRP comparing to patients without such complications on 3rd POD; 179 mg/ml vs. 94 mg/ml ($P = 0.0004$) and on the 6th POD; 138 mg/ml vs. 55 mg/ml ($P = 0.0005$). Patients without anastomotic leakage had lower median level of procalcitonin than patients with it on 3rd POD after operation (0.2 and 0.45 U/ml respectively, $P = 0.01$) and on the 6th POD. (0.2 and 1.0 U/ml respectively, $P = 0.034$).

Conclusion: Changes in CRP and PCT levels correlate with presence of anastomotic leakage, including rentgenological one.

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Waist to hip ratio better predicts oncological short- and long-term outcome after rectal cancer surgery than body mass indexD. Leonard^{1,2}, N. Hetsch^{1,2}, A. van Maanen², F. Penninckx³, H. Paterson⁴, C. Remuet^{1,2}, N. Abbes Orabi⁵, A. Kartheuser^{1,2} & On behalf of the Waist

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Aim: To determine whether body fat distribution, measured by waist-hip ratio (WHR), better predicts oncological short- and long-term outcome after rectal cancer resection than body mass index (BMI).

Method: A prospective multi-centre international study explored the effect of obesity on postoperative outcome after elective colorectal surgery. Patients operated for rectal cancer were extracted from this database and long-term follow-up was obtained. Influence of WHR on oncological outcome was analysed by uni- and multivariable analysis.

Results: Out of 1349 patients from 38 centres in 11 countries included in the initial prospective trial, 295 patients from 24 centres underwent elective surgery for rectal adenocarcinoma. Mean BMI was 25.3 ± 4.4 and WHR 0.96 ± 0.12 . Medical complications occurred in 51 patients (17.3%), surgical complications in 81 (27.5%). In-hospital mortality was 0.7%. Median follow-up was 44.2 months (0.6–65.7). Multivariate analysis showed that WHR but not BMI was predictive of TME quality. Other surrogates for oncological outcome, i.e. pCRM, distal margin involvement and number of lymph nodes retrieved were not significantly influenced by either WHR or BMI. WHR was an independent prognostic factor of overall recurrence, but not of overall survival.

Conclusion: WHR was more effective than BMI in predicting quality of TME surgery and overall recurrence.