SINGLE INCISION LAPAROSCOPIC (SILS) RESTORATIVE PROCTO-COLECTOMY WITH ILEAL POUCH-ANAL ANASTOMOSIS

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Introduction: Restorative procto-colectomy with ileoanal pouch is the definitive procedure for ulcerative colitis. Using the single incision laparoscopic (SILS) approach has potential benefits; minimising cutaneous and parietal trauma, thus reducing postoperative pain and expediting recovery.

Methods: Electronic data were prospectively collected from all patients who underwent SILS restorative procto-colectomy (SILS-RPC): June 2009 - June 2010.

Results: 10 consecutive patients (4 male), median BMI 22 (20-28kg/m²) underwent SILS-RPC over a 1yr period. Three had undergone a previous emergency laparoscopic colectomy. Single port devices were positioned at the site of the existing or proposed temporary ileostomy (2.5cm incisions). The colon and rectum were extracted through the SILS site (n=8) or transanally following a mucosectomy (n=2). 20cm J-pouches were constructed extra-corporeally and returned via the ileostomy site. Pouch-anal anastomosis was performed intra-corporeally (n= 8) or hand sutured (n=2) and a diverting loop ileostomy created at the SILS port site. The median operation time was 185mins (100-381). There were no conversions or additional ports required. Median time to full diet was 36hrs (4-48hrs), with a median hospital stay of 3 days (2-8 days). There were no 30-day readmissions. Complications were: i) surgical emphysema/pyrexia and ii) panic attack. Nine stomas have been closed. All patients have spontaneity of defecation, with a median pouch frequency four per 24hrs, including once at night. All are fully continent and able to defer during the day. One reported a dry ejaculate for 10 weeks.

Conclusion: Early experience suggests that SILS restorative procto-colectomy is safe with good early functional outcomes.

Key statement: Our early experience of SILS restorative procto-colectomy and ileo-anal pouch anastomosis, as a definitive procedure for patients with ulcerative colitis, suggests that this is a safe technique, with additional benefits over conventional laparoscopic surgery in terms of reduced pain, improved cosmesis and a shorter recovery with prompt return of function.
OBJECTIVE ASSESSMENT OF SKILLS ACQUISITION FROM CORE SKILLS IN LAPAROSCOPIC SURGERY COURSE OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

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Introduction: Participation in simulator-based short laparoscopic skills courses is recommended for most surgical trainees before live surgery. This prospective study aims to objectively assess the acquisition of skills from “Core Skills in Laparoscopic Surgery Course” of the Royal College of Surgeons (RCS) of England.

Methods: Data were collected from junior surgical trainees attended the course at the Barts and The London School of Medicine and Dentistry from 2008 to 2010. Three laparoscopic virtual tasks (camera navigation, hand-eye co-ordination and two-handed maneuver) were used from virtual reality simulator (Simbionix) for pre and post course skills assessment. Camera navigation was assessed by completion time and maintenance of horizontal view whereas the other two tasks were assessed by completion time, path length (both hands) and the number of movements (both hands). Composite score was calculated to define overall laparoscopic skills by combining all the 12 parameters. Acquisition of laparoscopic skills was tested using paired t-test at the 5% level of significance. However, individual task specific parameter was tested at the 0.42% (5/12) level, according to Bonferroni correction, to avoid multiplicity.

Results: Out of 37 trainees, 34 participated as 3 were not suitable for the study. There was a significant improvement on composite score (P<0.001). There were also significant improvements in 10 out of 12 task specific parameters (P-value ≤ 0.004) except path length of left hand.

Conclusion: The Royal College of Surgeons course “Core Skills in Laparoscopic Surgery” significantly improved the laparoscopic skills of junior surgical trainees measured via the virtual reality simulator.

Key statement: Laparoscopic skills, Assessment, Skills courses, Surgical training, Virtual Reality Simulator.
SINGLE-PORT ACCESS SURGERY (SPAS) OPERATIVE PERFORMANCE BY EXPERIENCED SURGEONS: ARTICULATED VERSUS STANDARD STRAIGHT INSTRUMENTS

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Introduction: To compare operative performance by experienced surgeons using standard straight versus articulated instruments on a SPAS box-trainer.

Methods: Ten consultant surgeons performed two basic laparoscopic tasks – Peg Transfer and Pattern Cutting after being randomised into two equal groups. Performance time, errors and instrument clashes were measured. Data were analysed using independent-sample t-test after calculating the Overall Precision (OP) and Overall Performance Time (OPT) to avoid multiple comparisons.

Results: Compared with the standard straight, the use of the articulated instruments did not differ significantly in OPT (OPT Art. = 282 ± 11 versus OPT St. Str. = 275 ± 12, p-value = 0.856). The articulated instruments enabled significant improvement in the OP by minimizing both errors and instrument clashes. (OP Art. = 4.2 ± 0.4 versus OP St. Str. = 9.8 ± 0.7, p-value = 0.03).

Conclusions: Our study shows improvement in precision and reduces technical errors using articulated instruments. This is achieved by increasing the range of the operating field by better triangulation in SPAS. We aim in the future to conduct similar studies in live operations.

Key statement: SPAS is the latest innovation of minimal invasive surgery. Technical difficulties due to the loss of triangulation require further investigation so this innovation can further develop.
LAPAROSCOPIC COLORECTAL SURGERY- AN ONCOLOGICAL ADVANTAGE?

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Introduction: Laparoscopic colorectal surgery can provide improved short-term benefits such as reduced length of stay compared to open surgery. Laparoscopic resection specimens are pathologically equivalent to open surgery. There is evidence that suggests receiving chemotherapy promptly after surgery may improve long-term survival. Our aim was to assess the survival of patients receiving open and laparoscopic colorectal resections in relation to the time to starting chemotherapy.

Methods: A retrospective audit was undertaken of patient records between Oct 2003 and Dec 2008. Potential cases were identified from clinical coding and the notes were reviewed and the relevant information obtained. Data was collated on a database and analysed using PASW version 18.

Results: During this period 190 open resections and 261 laparoscopic resections were performed for bowel cancer. Following elective surgery chemotherapy was given to 60 of the open group and 94 of the laparoscopic group. There was no difference in age, gender, ASA or pathological staging between the groups. The laparoscopic group had a significantly shorter length of stay, 3 days versus 7 (p<0.0005). The mean number of days to starting chemotherapy after elective open surgery was 60.02 compared to 40.17 for elective laparoscopic surgery (p<0.0005). The 5-year survival following elective open resection was 70% and for elective laparoscopic resection was 80.6% (p=0.045).

Conclusion: Laparoscopic colorectal surgery for adenocarcinoma may offer a long-term survival advantage when post-operative chemotherapy is administered. Improved survival following laparoscopic colorectal surgery may be secondary to a shorter time to chemotherapy or to a reduction in immunosuppression post-operatively.

Key statement: Laparoscopic colorectal surgery for adenocarcinoma may offer a long-term survival advantage when post-operative chemotherapy is administered.
CIRCULAR STAPLED ANTECOLIC ANTEGASTRIC LAPAROSCOPIC ROUX EN Y GASTRIC BYPASS FOR MORBID OBESITY: RESULTS FROM SINGLE HANDED 200 CONSECUTIVE CASES

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Introduction: Laparoscopic Roux en Y gastric bypass (LRYGB) is the commonest bariatric procedure performed worldwide for management of morbid obesity. Firstly carried out in UK in 2000, it is a very challenging procedure with steep learning curve. The aim of this review is to set UK standards for procedures performed in NHS teaching hospitals.

Methods: Retrospective review of last 200 consecutive cases of LRYGB carried out as primary or revisional procedure by single surgeon in bariatric units with dedicated facilities. Average preoperative patients BMI was 48 (35-64) with age of 41 years (18-69). 10% of cases were conversion to LRYGB from other procedures. Additional procedures (cholecystectomy, hernia repair, etc.) were carried out in 15% of cases. LRYGB involved triple-stapled technique for jejuno-jejunostomy and 21mm circular stapled gastro-jejunostomy. Limbs were placed antecolic antegastric and all mesenteric defects closed. Air leak test was performed for gastro-jejunostomy.

Results: No mortality or conversion to laparotomy was recorded. Overall major complications rate was 3.5% with 6 patients required re-laparoscopy and 1 port site hernia. Leak rate was 0.5% with 1 case of late gastro-jejunostomy necrosis. Average operative time was 105min (50-240) with LOS of 2.8 days (2-35). Minor complications included 9 staple line bleeds conservatively treated and 10 late anastomotic strictures requiring endoscopic balloon dilatation.

Conclusion: LRYGB can be performed in UK with incidence of major complication below 5%. Anastomotic leaks are rare. Low complication rates can be achieved by structured training and high caseload.

Key statement: Laparoscopic gastric bypass can be performed in UK with incidence of major complication below 5%. Anastomotic leaks are rare. Low complication rates can be achieved by structured training and high caseload.
LAPAROSCOPIC SLEEVE GASTRECTOMY via SINGLE UMBILICAL ACCESS: IS THIS THE FUTURE OF BARIATRIC SURGERY?

1 YEAR PIONEER EXPERIENCE

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Introduction: Single access laparoscopic surgery is the new frontier of laparoscopy. It utilises the umbilicus as sole access for camera and instruments avoiding other incisions in the abdominal wall. Specific skills and instruments are required

Methods: 15 female cases were selected to undergo laparoscopic Sleeve Gastrectomy (LSG) via umbilical access. Patients average BMI was 42 (range 37-47). After 25mm transverse incision at umbilicus, SILS (Covidien) or SSL (Ethicon) ports were employed. A standard LSG (tightly calibrated over 32Ch-Bougie) was then performed via the single umbilical access. Stomach was mobilised using ultrasonic coagulation and stapling was commenced 6cm from pylorus using Echelon-Flex stapler (Ethicon-EndoSurgery) with Seamguard (Gore) as staple line reinforcement. A 5mm 30° long camera was used and articulating graspers with trans-abdominal sutures were employed to manipulate stomach and achieve liver retraction.

Results: 13 cases were completed with single access at umbilicus with no additional trocars or incision. Two cases were converted to standard LSG due to insufficient instruments length. Mean operating time of 80min (range 49-120) was within the range of conventional LSG. Postoperative was uneventful with hospital stay of 48-72hrs. No complications or readmissions were recorded. 1 patient returned to work within 5 days from surgery. At follow-up no visible abdominal scar or umbilical hernia was found in any patient.

Conclusion: Single Access can be offered for LSG in selected patients (height <165cm) without increasing operating time or complication rates. Cosmesis is excellent but other advantages have yet to be proven.

Key statement: Single Access can be offered for laparoscopic Sleeve Gastrectomy in selected patients (height & lt;165cm) without increasing operating time or complication rates. Cosmesis is excellent but other advantages have yet to be proven.
SINGLE-CENTRE COMPARATIVE STUDY OF LAPAROSCOPIC VERSUS OPEN RIGHT HEMI-HEPATECTOMY

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Introduction: The expansion of major laparoscopic liver resection is still limited due to the well-recognised technical difficulties and to the lack of clinical data comparing the open and laparoscopic approaches.

Methods: This case-control study was undertaken over a 4-year period (2006-09) in a high-volume liver unit. Patients requiring right hepatectomy in whom the procedure appeared possible via either open or laparoscopic surgery were identified by the hepato-biliary multidisciplinary team. Three surgeons were involved: two in the laparoscopic procedures and one in the open. Patients in the open-surgery group were matched according to sex, age and liver disease and compared with the laparoscopic group.

Results: Thirty-six patients underwent totally laparoscopic right hepatectomy (LRH) and 34 open right hepatectomy (ORH). Operative time was longer for LRH (median 300min vs. 180min for ORH, p<0.0001). Intensive care unit (median 2 days for LRH vs. 4 for ORH, p<0.0001) and postoperative length of stay (5 days for LRH vs. 9 for ORH, p<0.0001) were shorter for LRH. No significant difference in complications and mortality rate was observed between LRH and ORH. Among patients with colorectal liver metastases, R0 resection was obtained in 20/21 (95%) cases after LRH, and in 20/25 (80%) after ORH (p=0.198). Mid-term overall survival did not significantly differ between the laparoscopic and the open group.

Conclusion: LRH can be a safe, effective, and oncologically efficient alternative to open resection in selected cases. Extensive experience in hepatic and laparoscopic surgery is required.

Key statement: Laparoscopic right hepatectomy can be a safe, effective, and oncologically efficient alternative to open resection in selected cases. Extensive experience in hepatic and laparoscopic surgery is required.
ROUTINE DEFUNCTIONING IS NOT NECESSARY AFTER LAPAROSCOPIC LOW ANTERIOR RESECTIONS FOR RECTAL CANCER

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Introduction: Patients following anterior resections have better outcomes and quality of life than abdomino-perineal resections but covering ileostomies can add to morbidity and is disliked by many patients. This study explores the safety of laparoscopic surgery and avoidance of stoma after low anterior resections for rectal cancers.

Methods: Retrospective analysis of prospectively collected data of all elective low anterior resections, total mesorectal excision (TME) for rectal cancers between 2007 and 2009. Demographic data, operative details and data on outcomes (curative resection rates, TME grading, length of stay morbidity and mortality) was collected. Outcomes were compared between the laparoscopic and open group as well as those with a defunctioning stoma as against those who did not.

Results: Of the 204 patients with rectal cancers, 89 patients underwent low anterior resections (LAR). The mean age was 67.4yrs (44-83). Sixty seven patients (75%) were males. Twenty eight patients (30%) had neo-adjuvant treatment.  Sixty one patients (68.5%) underwent laparoscopic resections (LR) while twenty eight were open (OR). Thirty three patients (37%) did not have a covering ileostomy after LAR (LR-25; OR-8). Of the fifty six patients who had ileostomy, 36 patients had LR. Most patients who had neo-adjuvant treatment had a covering stoma (23/28 patients). Short term outcomes were favourable for the laparoscopic group when compared to the open group. Patients without a defunctioning stoma also did significantly better than those who had stoma.

Conclusion: Laparoscopic surgery is safe and achieves oncological objectives for rectal resections. In selected patients, avoiding a defunctioning stoma is associated with favourable outcomes.

Key statement: Laparoscopic surgery is safe and achieves oncological objectives for rectal resections. In selected patients, avoiding a defunctioning stoma is associated with favourable outcomes.
OUTCOMES OF THE NATIONAL TRAINING PROGRAMME IN LAPAROSCOPIC COLORECTAL SURGERY

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Introduction: The early learning curve of self-taught laparoscopic colorectal surgery (LCS) is coupled with increased rates of undesirable clinical outcomes. The National Training Programme (Lapco) was set up to provide structured training to colorectal surgeons. The aim of this study was to review the educational and clinical outcomes of this programme.

Methods: Clinical endpoints (conversion, post-operative complication, length of hospital stay, mortality) were collected prospectively. Educational outcomes were measured using a validated scoring tool that describes the degree to which trainees were dependent on trainer support for each step of the procedure. Proficiency gain curves were analysed using logistic regression for risk-adjusted CUSUM curves.

Results: Clinical outcomes: 99 trainees and 50 trainers completed 1493 assessments representing 1058 training cases (779 by trainers, 714 by trainees, 459 by both). Post-operative complication rate was 11.9%, conversion rate 4.2%, median hospital stay 5 days (interquartile range 4-6) and in-hospital mortality 0.6%. No significant learning curve for any of these parameters could be found for the first 26 training cases. Educational outcomes: Although the proficiency gain curve for the overall score levelled after 24 procedures, the dissection of the vascular pedicle, colon mobilisation (in particular hepatic/splenic flexures) and total mesorectal excision (TME) take substantially longer.

Conclusion: The outcomes of this study suggest that this structured educational national programme overcome the initial learning curve in LCS effectively and safely. Clinical outcomes are comparable to those of expert laparoscopic surgeons.

Figure: Average proficiency gain curves for all trainees (CUSUM). Theatre setup, exposure of the operating field, anastomosis and the overall score each levels out within the first 25 procedures. The more difficult tasks [mobilisation, dissection of vascular pedicle, hepatic and splenic flexure mobilisation and total mesorectal excision (TME)] take longer.
Key statement: A national structured training programme is a feasible intervention to overcome the initial learning curve in laparoscopic colorectal surgery. Clinical outcomes are comparable to those of expert laparoscopic surgeons.
DAY-CASE CHOLECYSTECTOMY IN ENGLAND – AT WHAT COST?

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Introduction: Laparoscopic cholecystectomy (LC) is listed on the British Association of Day Surgery’s trolley of day case procedures and the Audit Commission’s basket of procedures for day surgery. This study investigates the results of changes in practice following publication of the Department of Health’s strategy for day surgery in 2002.

Methods: NHS patients who underwent a cholecystectomy in England between April 2000 and March 2007 were identified from Hospital Episode Statistics (HES). Length of stay (LoS), day case rates and readmissions were analysed for patients who underwent laparoscopic cholecystectomy.

Results: 331,867 elective cholecystectomies were undertaken. 83.3% of these were carried out laparoscopically. Median LOS decreased from 2 days in 2000-1 to 1 day in 2006-7. During the same period there has been a seven fold rise in the day-case rates with 21.8% patients who underwent LC in 2007 being discharged on the same day (p<0.001). However, there has been a significant increase in readmissions within 28 days of LC; having risk-adjusted for age and gender, there was a 28% higher readmission rate within 28 days of surgery (p<0.001). Re-interventions for infective complications were undertaken within 30 days of surgery in 0.4% cases in 2000 but almost increased two-fold in 2007 (p<0.001).

Conclusion: Day case rates are improving, however this is possibly at increased risk of readmission and infection. This has consequences with regards to recent proposals to financially penalise trusts for readmissions. We propose that length of stay of readmissions should be considered in conjunction with the primary LOS.

Key statement: Government recommendations have prompted surgeons and hospitals to improve day-case rates of laparoscopic cholecystectomy. However, the higher day-case rates coincide with increased re-admissions and possible increase in infective complications. This has significant importance in light of proposed strategy not to remunerate trusts for complications or re-admissions.
DISTRICT GENERAL HOSPITAL (DGH) EXPERIENCE IN THE MANAGEMENT OF THREE CASES OF CATERPILLAR DEFORMITY ENCOUNTERED DURING LAPAROSCOPIC CHOLECYSTECTOMY

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Introduction: To highlight the importance of precise and meticulous dissection of Calot’s triangle to detect anatomical anomalies, in order to avoid injury to the important structures during laparoscopic cholecystectomy.

Methods: Video presentation of District General Hospital (DGH) experience of three cases of Caterpillar anomaly of right hepatic artery encountered during laparoscopic cholecystectomy.

Results: Anatomical variations in the origins and branching patterns of the hepatobiliary arterial system may be encountered during laparoscopic cholecystectomy and could be managed safely by trained laparoscopic surgeons as presented in these cases.

Conclusion: Laparoscopic management of the anatomical variations of the hepatobiliary arterial system is possible, provided meticulous, precise and bloodless dissection is performed for Calot’s triangle in laparoscopic cholecystectomy, with the availability of the expertise.

Key statement: Video presentation of three cases of Caterpillar deformity of right hepatic artery encountered during laparoscopic cholecystectomy, and could be managed safely.
A SIMPLE, LAPAROSCOPIC PULL THROUGH TECHNIQUE TO REPLACE A LEAKING GASTRIC BAND

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Introduction: A leak from a gastric band results in a permanent failure of the device that can only be resolved with further surgery. As more patients are having gastric bands inserted, this is inevitably going to become a commonly encountered problem. Personal communication with experienced gastric band surgeons estimates that the leak rate is as high as 5% in some of the older devices. Many surgeons will resort to taking down the entire wrap or tunnel around the band in order to replace it in these situations. This has the potential to cause a perforation of the stomach or oesophagus during the procedure and will leave the patient with a higher risk of band slippage than following a primary insertion.

Our DVD demonstrates a quick and simple, alternative technique to replace a leaking gastric band in a patient who has had very successful weight loss (74% of her excess body weight after five years) with a Swedish Gastric Band.

Methods: A low profile, malleable AMI Soft Gastric Band is coupled onto the end of the Swedish Gastric Band and pulled through to sit in the same tunnel as the original gastric band. None of the previously inserted gastro-gastric sutures required taking down, making this a far safer procedure than the original insertion or alternative techniques for replacement. As the original band position was otherwise ideal and provided excellent weight loss, we predict that the risk of subsequent band slippage will be minimal.

Conclusion: This procedure was performed as a day case and with virtually no blood loss

Key statement: A simple, day case procedure to replace a leaking gastric band that does not require the wrap to be taken down is demonstrated on our DVD.
TRANSANAL DIVISION OF ANO-RECTAL JUNCTION FOLLOWED BY LAPAROSCOPIC LOW ANTERIOR RESECTION AND HAND SEWN COLO-ANAL ANASTOMOSIS, A SPHINCTER SAVING PROCEDURE

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Introduction: To assess patients undergoing this procedure over the last 2 years. Outcome measures included mortality, morbidity, resection margins and functional outcome. The pouch function was assessed using McMaster Quality of life (QOL), Cleveland constipation and incontinence scores at various intervals.

Methods “Technique”:

- Trans-anal division of the ano-rectal junction 1.5cm above the dentate line using Lonestar retractor
- Closure of the ano-rectal junction by continuous suture
- Laparoscopic low anterior resection
- A trans-anal balloon port can help in the delivery of a J pouch
- Interrupted hand-sewn Colo-anal pouch anastomosis

Results: 3 patients with good sphincter function and no history of obstetric injury or anal surgery were included (2 females). No morbidity or mortality. All patients had clear margins. The pouch function was satisfactory with the exception of 1 patient who is dependant on Loperamide to achieve reasonable function.

Conclusion: This technique can be offered as a sphincter-saving technique for accurate identification of distal resection margins and preserving adequate function.

Key statement: Trans-abdominal identification of the distal extent of small rectal lesions/ carpet of severe dysplasia close to the dentate line is difficult. Moreover cross stapled anastomosis may inadvertently affect sphincter function. Trans-anal division of the ano-rectal junction accurately achieves clear margins, preserves the anal transitional zone and helps minimise sphincter damage.
SINGLE PORT LAPAROSCOPIC SUBTOTAL GASTRECTOMY WITH D1 LYMPHADENECTOMY

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Introduction: ‘Conventional multiport’ laparoscopic gastrectomy for early stage gastric cancer is an increasingly frequently performed procedure. We describe our experience of the first reported single port laparoscopic subtotal gastrectomy in an 88 year old lady with early antral gastric adenocarcinoma.

Methods: Single port laparoscopic subtotal gastrectomy with D1 lymphadenectomy was successfully performed using a transumbilical multichannel single port. Straight and flexible tipped laparoscopes were used to obtain off axis views of the operative field. A flexible stapler and curved instruments were used to re-construct the Polya type gastrojejunostomy. The procedure was performed without compromising standard, oncological principles.

Results: Specimen histology revealed moderately to poorly differentiated adenocarcinoma infiltrating the submucosa. Proximal and distal resection margins were tumour free. Furthermore, 41 tumour free lymph nodes were harvested. The patient was discharged on post-operative day 6.

Conclusion: Single port gastrectomy for cancer is technically and oncologically feasible when performed by experienced minimally invasive surgical oncologists with extensive experience of benign single port laparoscopic procedures. The advantages to the patient in terms of cosmesis and shorter hospital stay are clear. However, further studies are required to assess this technique when treating gastric, and other malignancies.

Key statement: ’Conventional multiport' laparoscopic gastrectomy for early stage gastric cancer is an increasingly frequently performed procedure. We describe our experience of the first reported single port laparoscopic subtotal gastrectomy in an 88 year old lady with early antral gastric adenocarcinoma.
SILS THREE STAGE RESTORATIVE PROCTOCOLECTOMY WITH ILEO-ANAL POUCH

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Introduction: Single incision laparoscopic surgery (SILSTM) has the potential to enhance cosmesis and reduce morbidity following minimally invasive surgery. Although still in evolution, increasingly, complex procedures including SILS colonic resections are being reported.

In the video, we present a three-stage SILS restorative proctocolectomy (Stage I-SILS subtotal colectomy, stage II-SILS completion proctectomy and ileo-anal pouch formation, and stage III-reversal of defunctioning ileostomy) highlighting the key steps in this technically demanding surgery.

Methods: A 28-year old female with refractory ulcerative colitis underwent SILS subtotal colectomy in January 2010 through a 2.5-cm trans-umbilical incision. In July 2010, using a SILS port through the ileostomy site a completion proctectomy and ileal pouch anal anastomosis was constructed. In September 2010, the defunctioning ileostomy was reversed completing the third stage.

A multichannel SILSTM port and only standard laparoscopic instruments were used and no drains were inserted. The external views captured using a digital camera and the onscreen MPEG video files were edited "in-house".

Results: The video demonstrates the feasibility of successfully undertaking this complex surgery with novel ideas to aid retraction and dissection in difficult planes including the deeper pelvis. The overall hospital stay was 11-days (subtotal colectomy- 4-days, completion proctectomy- 4-days, and ileostomy reversal- 3-days) and postoperative analgesia included oral paracetamol and diclofenac.

Conclusion: We have shown that a 3-stage restorative proctocolectomy can be performed via a single incision technique without additional ports enabling a safe and successful outcome. The 3.5 cm final scar provided an excellent cosmetic outcome for the patient.

Key statement: A 3-stage restorative proctocolectomy can be performed via a single incision technique without additional ports enabling a safe and successful outcome.
LAPAROSCOPIC WASHOUT FOR PERFORATED DIVERTICULAR DISEASE

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Introduction: Although Hartman’s procedure remains the recommended approach in perforated diverticular disease there has been increasing interest in laparoscopic washout. Recent attention has focussed on the long-term outcome of diverticulitis. Population based studies have shed doubt on the need for preventative resection in the absence of ongoing symptoms. If a later resection is not inevitable then its avoidance during the acute phase is doubly attractive while avoidance of a stoma is an additional bonus.

Methods: Detailed descriptions of the technique of laparoscopic washout in diverticulitis are lacking. This DVD details one approach that we have adopted. It focuses on the case of a 72 year old man presenting with generalised peritonitis. His pre-operative CT scan demonstrating free abdominal gas and a thickened sigmoid colon is presented. His post-operative inflammatory markers are charted.

Results: Following open cut down at the umbilicus a 30 degree camera and and two 5mm instrument ports are introduced. Contrary to some descriptions we have carefully explored the phlegmon to exclude an underlying faecal leak (Hinchey IV) and have separated the small bowel throughout its length to avoid inter-loop abscesses. In this case a ruptured peri-colic abscess is apparent (Hinchey III) and so a laparoscopic washout is completed. The sub-hepatic, sub-phrenic, para-colic and pelvic spaces are methodically drained and copiously lavaged. A drain is placed to the abscess site to give early warning of the development of a fistula.

Conclusion: We believe this approach ensures a precise diagnosis and correct patient selection. It diminishes the septic burden and helps to avoid a potentially protracted recovery.

Key statement: Detailed descriptions of the technique of laparoscopic washout in diverticulitis are lacking. This DVD details one approach that we have adopted for laparoscopic washout in Hinchey grade III perforated diverticular disease.
LAPAROSCOPIC MESH REPAIR OF PARASTOMAL HERNIA

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Introduction: Parastomal hernias are a common complication and frequently require treatment to improve appliance fit or relieve pain. The aim of this DVD is to demonstrate a simple technique for the laparoscopic repair of parastomal hernias using a synthetic mesh.

Methods: A coated mesh is modified by cutting a “star” in the centre. It is wrapped around the stoma so that the points of the star are directed towards the peritoneal cavity and the overlapping edge is tacked into place. Great care is taken to ensure that the mesh is secure but the bowel undamaged.

Results: The technique is simple and easily mastered by trainees.

Conclusion: Parastomal hernias are a common problem and a simple technique for repair is demonstrated.

Key statement: Parastomal hernias are a common problem and this DVD demonstrates a simple technique for laparoscopic mesh repair.
LAPAROSCOPIC REPAIR OF MIRIZZI TYPE II SYNDROME

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Introduction: We present a case of Mirizzi type II syndrome, a rare complication of chronic gallstone disease causing local inflammation and ultimately fistulation between Hartmanns pouch/cystic duct and the common hepatic duct.

Methods: An 86 year old patient was investigated for painless jaundice and weight loss. ERCP was unsuccessful and CT showed a large stone impacted in Hartmanns pouch with significant intra-hepatic biliary dilatation, suggesting a diagnosis of Mirizzi type II syndrome. After stabilising the patient’s chronic renal failure, he proceeded to surgery.

Results: Normal Calot’s triangle anatomy was absent due to chronic inflammatory changes. After removing a large 7x5cm gallstone through a cholecystotomy, the gallbladder was dissected fundus-first to reduce risk of damage to the common bile duct. A sub-total cholecystectomy was performed and the Hartmanns pouch remnant was closed over a T-tube. Subsequent intra-operative T-tube cholangiogram confirmed no bile leak and no distal obstruction with contrast passing easily into the duodenum.

Conclusion: Mirizzi Syndrome alters normal anatomy due to chronic inflammation, causing potential difficulties and increased risk of bile duct damage during cholecystectomy. This video demonstrates a safe and effective technique to deal with this complication.

Key statement: Mirizzi Syndrome presents significant difficulties during cholecystectomy because of alteration to the normal anatomy due to chronic inflammation, fibrosis and fistulation. This video demonstrates a safe and effective technique to deal with this complication; the operation should only be undertaken by an experienced laparoscopic surgeon with an understanding of the underlying pathophysiology.
Introduction: Laparoscopic cholecystectomy (LC) is the gold standard treatment for symptomatic gallstone disease. A substantial proportion of Internet users search for medical information and such information is not always guaranteed to be accurate and understandable. Our aim was to evaluate the quality and readability of Online information for patients undergoing LC.

Methods: We searched for the keywords “laparoscopic cholecystectomy” using Google, Yahoo and MSN and looked at the first 40 websites only. The readability of each document was assessed using the Flesch reading ease (FRE) score. We checked whether each Website was certified by the Health on the Net Foundation Code of Conduct (HONcode).

Results: Only 41 sites were analysed because of repetitions, irrelevant content or inaccessible links; five of those were HONcode-certified. 46% of the analysed Websites had been checked by a medical expert and 22% were updated within one year. The mean FRE score was 42.9 (range 6.5-69.1), indicating a difficult readability level.

Conclusion: This study highlights the poor quality and readability of information on medical websites. The HONcode seal on subscribing sites helps users identify sources of reliable information. Webmasters and healthcare professionals should collaborate and aim to develop reliable and good quality evidence-based patient education materials.

Key statement: Patients routinely surf the Internet to access health-related information which is not guaranteed to be accurate, reliable and up-to-date. The public needs to be aware of these limitations and healthcare professionals should direct patients to selected high-quality reliable Websites such as those accredited by the Health on the Net Foundation.
POSTER 02

SURGICAL MANAGEMENT OF BENIGN AND INDETERMINATE HEPATIC LESIONS IN THE ERA OF LAPAROSCOPIC LIVER SURGERY

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Introduction: The rapid expansion of laparoscopy for the surgical treatment of benign liver lesions has raised concerns regarding the risk of widening surgical indications and compromising safety, particularly when major hepatectomy are required. Large single-centre series focusing on laparoscopic management of benign liver lesions are still sporadic.

Methods: We reviewed a prospectively collected database of patients undergoing laparoscopic liver resection (LLR) for benign liver lesions. Prior to surgery, all cases were discussed at an open multidisciplinary team meeting with surgeons, pathologists, oncologists, gastroenterologists and radiologists.

Results: Forty-six patients underwent 50 LLRs for benign disease. Indications for surgery were: symptomatic benign lesions, preoperative diagnosis of adenoma or cystadenoma, and lesions with an indeterminate diagnosis. The preoperative diagnosis was uncertain in 11 cases. Of these, histological diagnosis was hepatocellular carcinoma in one (9%) and benign lesion in 10 patients (91%). Thirteen patients (28%) required major hepatectomies, including 7 right hemi-hepatectomies and 6 left hemi-hepatectomies. One (2%) conversion occurred due to bleeding. Three patients (7%) developed postoperative complications. Mortality was nil. The median postoperative hospital stay following major and minor hepatectomy was 4 and 3 days respectively.

Conclusion: The laparoscopic approach represents a feasible and safe option for the management of benign and indeterminate liver lesions, even when major hepatectomy is required. This surgery should be only performed in specialized centres to ensure safety and strict adherence to orthodox surgical indication.

Key statement: The laparoscopic approach represents a feasible and safe option for the management of benign and indeterminate liver lesions, even when major hepatectomy is required.
THE ROLE OF LAPAROSCOPIC SURGERY IN TWO-STAGE HEPATECTOMY FOR BILOBAR COLORECTAL LIVER METASTASES


Southampton University Hospitals NHS Trust, Southampton, Hampshire, United Kingdom

Introduction: The role of laparoscopy in two-stage hepatectomy for bilobar colorectal liver metastases (CRLMs) has not yet been extensively investigated.

Methods: We reviewed a prospectively collected database of all patients undergoing two-stage hepatectomy at our institution between April 2007 and November 2009.

Results: Seven patients underwent two-stage hepatectomy for bilobar CRLMs (male n=5, median age 64). The first stage consisted of laparoscopic clearance of the left lobe with no postoperative morbidity and mortality. Six patients underwent portal vein embolization. The median interval between first and second stage hepatic resections was 89 days (range 36 – 123 days). Second-stage hepatectomy with right lobar clearance (open n=5, laparoscopic n=2) was associated with no mortality and an operative morbidity rate of 43%. Complications included intra-abdominal collection (n=2), and bleeding requiring re-operation (n=1). Two patients (29%) died for disease recurrence. The first death occurred 16.5 months from diagnosis (12 months from second stage surgery) and was due to widespread extrahepatic metastases. The second fatal case survived for 30.5 months from diagnosis (22 months from second stage surgery) until death from intrahepatic recurrence. Of the remaining five patients, four are disease-free at a median follow-up of 11.5 months (range 8.5 – 15 months).

Conclusion: The well recognized advantages of laparoscopy (e.g.: less intrabdominal adhesions and faster recovery) may play a favourable role in the management of patients with bilobar CRLMs who are candidates for a two-stage resection. The first-stage laparoscopic clearance of the left lobe should progressively become the “gold standard”.

Key statement: The well recognized advantages of laparoscopy may play a favourable role in the management of patients with bilobar colorectal liver metastases candidate for a two-stage resection. The first-stage laparoscopic clearance of the left lobe should progressively become the “gold standard”.
CHANGING TRENDS IN THE MANAGEMENT OF CBD STONES: A 13 YEAR FOLLOW UP STUDY

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Introduction: The management of choledocholithiasis varies between a single session approach to those preferring a staged procedure utilising laparoscopic cholecystectomy (LC) and ERCP. Recent evidence favours laparoscopic bile duct exploration (LCBDE) as the index procedure. We aimed to establish if this has permeated into a change of practice amongst surgeons.

Methods: We canvassed the opinion of all general surgeons working in Scotland during 1997 and 2010 with a standardised questionnaire looking at the caseload, investigations and opinions on treatment of CBD stones. Analysis was with Microsoft Access and SPSS. 120/157 respondents treated gallstone disease in 1997. In 2010 67/79 treated gallstones.

Results: Currently 35% personally offer LCBDE (19% in 1997). 41% have LCBDE provision in their own hospital (33% in 1997). Only 10% perform LCBDE universally (2% in 1997). Regarding their 1st choice; 66% still prefer ERCP+LC (82% in 1997). 38% feel LCBDE is the future first choice (21% in 1997).

Conclusion: LCBDE has become a more accepted form of management but lacks universal uptake. This may reflect both an expertise and resource vacuum. A more subspecialist approach to managing CBD stones can overcome these obstacles and allow management to take place in a single session for the vast majority of patients.

Key statement: The benefit of laparoscopic bile duct exploration (LCBDE) is now compelling. Our Scotland wide questionnaire follow up study has shown that although uptake of LCBDE has increased over the last 13 years; it is still not a first choice procedure for the majority. A subspecialist approach may allow more patients to benefit.
POSTER 05

Training in laparoscopic colorectal surgery using Thiel fixed cadavers

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Introduction: Training in laparoscopic colorectal surgery continues to present challenges. Available animal models are insufficiently accurate. Virtual reality simulators remain insufficiently developed. Conventional fixation of human cadavers precludes a realistic dissection. Fresh frozen cadaver currently represents the gold standard training model. However, there are considerable logistical challenges. Thiel fixation involving a glycol salt solution is claimed to preserve a cadaver while retaining tissue elasticity and compliance. A pilot study was undertaken to assess the use of Thiel fixed cadavers in laparoscopic colorectal training.

Methods: Four cadavers were used in an intensive 2 day training programme for 8 senior colorectal trainees. Four experienced theatre nurses and 7 expert faculty and observers were involved. Right hemicolectomy (RH), sigmoid colectomy (SC) and anterior resection (AR) were carried out. All were asked to rate generic elements of the model as well as the overall experience by procedure. Comparison was made to real life using a Likert scale (1= strongly disagree, 2= disagree, 3= neither agree or disagree, 4= agree, 5= strongly agree).

Results: The median (range) Likert scale (n=19) for pneumoperitoneum, handling of bowel, landmark identification, vascular pedicle dissection and opening of tissue planes were 4 (3-5), 5(3-5), 4(3-5), 4(3-5), 4(4-5) respectively. Overall experience for RH, SC and AR were 5 (4-5), 4(4-5) and 4(3-5) respectively. Faculty and trainee ratings did not differ.

Conclusion: This experience suggests that Thiel fixed human cadavers can provide a highly realistic training model for laparoscopic colorectal surgery. It may provide an alternative to the fresh frozen model while retaining the convenience of fixation.

Key statement: This study demonstrates that Thiel fixed cadavers can provide a highly realistic training model for laparoscopic colorectal surgery. There are considerable potential advantages in comparison to fresh frozen cadavers.
POSTER 06

PAIN, WELL BEING, BODY IMAGE AND COSMESIS: A COMPARISON OF SINGLE-PORT AND FOUR-PORT LAPAROSCOPIC CHOLECYSTECTOMY

Alec Aslanyan, Mikael Sodergren, Colleen McGregor, Andre Chow, Sanjay Purkayastha, Geoffrey Knox, Surbhi Malhotra, Ara Darzi, Paraskevas Paraskeva

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Introduction: Attempts to decrease operative trauma of laparoscopic cholecystectomy have led to the development of Single-Incision Laparoscopic Surgery (SILS). There is a lack of data comparing SILS to the gold standard four-port technique. This study compares post-operative pain, well-being, body image and cosmesis in SILS and Four-Port Laparoscopic Cholecystectomy (FPLC).

Methods: 42 consecutive patients (15 SILS, 27 FPLC), undergoing elective cholecystectomy at St. Mary’s Hospital London participated in the study. Using validated assessment tools (PI-NRS, SF8/12, BIQ, PSQ) data was collected peri-operatively (pre-op, 1h, 4h, 6h, 1d, 3d, 5d, 1w, 2w, 1m).

Results: Reduced pain scores were reported 1 week post-operatively in SILS patients (5.6 v 8.3; p=0.035). No significant differences in analgesic requirements, physical or mental well-being were reported. Significantly higher (favourable) body image questionnaire scores were reported in the SILS group 1 week (5.4 v 4.5; p<0.01), 2 week (5.6 v 4.8; p<0.01) and 1 month (5.7 v 5.0; p<0.01) post-operatively.

Conclusion: SILS significantly reduced 1 week pain scores when compared to laparoscopic cholecystectomy. Patients who underwent SILS had improved body image and cosmesis. If both techniques are found to be equivalent concerning safety, cost, learning curve and availability, SILS may play a key role in the future, in the new era of patient choice.

Key statement: Patients who underwent SILS (Single-Incision Laparoscopic Surgery) cholecystectomy have reduced 1 week post-operative pain, improved body image and cosmesis when compared to traditional four-port laparoscopy. If both techniques are equivalent concerning safety, cost, learning curve and availability, SILS may play a key role in the new era of patient choice.
POSTER 07

TRANSANAL ENDOSCOPIC OPERATION (TEO): A TECHNIQUE WITH POTENTIAL PROMISE.

Anil Bagul, John Richardson, Mark Watson

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Introduction: Transanal endoscopic operation is an adaptation of the recognised Transanal endoscopic Microsurgery (TEM). This method could be suitable for excision of benign disease and lesion deemed unsuitable for colonoscopic excision avoiding major surgery along with its associated morbidity. At TEM’s a magnifying binocular operating scope give a 3-dimensional operating field which requires expensive infrastructure and an extended learning curve where as for a TEO the kit uses laparoscopic equipment used routinely by colorectal surgeons.

This study aims to document the efficacy of the technique in a District Hospital setting.

Methods: This study reviewed consecutive patients undergoing a TEO between the period January 2009 to July 2010. Demographics, details of surgery, distance and size of rectal lesion, incidence of post-operative complications were listed along with hospital stay. All patients had a 6 month follow up. Data are presented as medians (range).

Results: Eighteen patients underwent TEO of those 9(50%) were male with median age of 68(59-91) years. The procedure required approximately 77.5(30-135) minutes. In our series the polyps resected varied from 20(8-50) mm in size and were situated at distance of 7.5(4-15) centimetres from anal verge. Histology confirmed 15 (83.3 %) as TVA and 3(17.6%) with adenocarcinoma. Clear resected margins were achieved in 17(94.4%) cases. The median inpatient stay was 2.5(2-7) days. Early complications in 1(5.5%) and late complications in 4(22%) were noted.

Conclusion: TEO is an effective way in the treatment of rectal tumours not accessible endoscopic or by submucosal dissection. Overall it is cost effective as the operative kit is inexpensive and the procedure is associated high precision and low morbidity.

POSTER 08

THE USE OF PORCINE COLLAGEN MESH TO PREVENT PERINEAL HERNIATION AFTER EXTRALEVATOR LAPAROSCOPIC ABDOMINOPERINEAL RESECTION OF THE RECTUM (ELAPR)

Anil Bagul, Peter Vaughan-Shaw, Mark Lewis, Michael Lamparelli

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Introduction: Postoperative perineal hernias have been reported as a rare complication after conventional Abdominoperineal resection. Multiple factors including female gender, pelvic irradiation, coccygectomy, hysterectomy, small bowel length and perineal infection have been associated. The combination of fewer adhesions after laparoscopic surgery and a more radical extralevator or cylindrical approach results in a large perineal defect which potentially could predispose to a perineal hernia.

Evaluation of the use of a porcine collagen mesh (Permacol-Coviden UK) as adjuvant to primary closure in preventing perineal herniation post ELAPR.

Methods: Patients undergoing elapr resection for rectal cancer by two surgeons at a single DGH were included. Twenty five patients undergoing an ELAPR between January 2005 and June 2010 were identified. A further eight patients who did not have mesh reconstruction were excluded. Data was collected on demographics, hospital stay, early and late complications, staging and preoperative radiation, resection margins on specimens and mortality.

Results: The median age was 67(42-87) years and included 10(62.5%) females. Seventeen patients underwent ELAPR with primary reconstruction with Permacol. Sixteen (94.1%) patients had preoperative radiotherapy. The median hospital stay was 9(5-68) days. Perineal complications were seen in 9(54.6%) patients; 4 patients had superficial wound break down with consequent delayed wound healing and a persistent perineal discharge was seen in a 5(29.4%) patients. Perineal hernia occurrence rate was 1(5.8%).

Conclusion: We saw no increase in post operative perineal hernia after the more radical ELAPR following the use of Permacol as primary repair. We advocate a use of a mesh like permacol for primary repair of perineal defect in such cases.

Key statement: Pelvic floor reconstruction after eLAPR is recommended, we think a porcine collagen mesh like Permacol is justifiable and safe.
EARLY EXPERIENCE OF LAPAROSCOPIC COLORECTAL SURGERY & ERAS FOLLOWING LAPCO TRAINING

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\textit{Princess Royal University Hospital, Farnborough Common, Kent, United Kingdom}\textsuperscript{1}, \textit{LAPCO & Basingstoke and North Hampshire NHS Foundation Trust, Basingstoke, Hampshire, United Kingdom}\textsuperscript{2}

\textbf{Introduction:} NICE guidance on Laparoscopic resection for Colorectal cancers (2006) called for every colorectal multi-disciplinary team to provide Laparoscopic Surgery by October 2010. Our Colorectal Unit provides an average of a 100 colorectal resections annually but lacked a Laparoscopic service.

The aim is an assessment of early results of a new laparoscopic colorectal service.

\textbf{Methods:} A Consultant Gastro-intestinal surgeon with previous colorectal experience was asked to train with LAPCO allowing the Colorectal Unit to offer a laparoscopic service over the last 6 months. Principles of Enhanced recovery after surgery (ERAS) were applied. Bowel preparation was used selectively for low rectal resections and we aimed for discharge at 4 days post-op.

\textbf{Results:} Laparoscopic resection was offered to 42 patients (35 cancers and 7 benign lesions). These included 14 right colectomies, 10 left colectomies, 2 Hartmann’s, 8 anterior and 3 AP resections, 3 colostomies and 2 conversions to open surgery. The median age was 67 (24 – 96) for 24 male and 18 female patients. Median stay was 5 days (3-22). 23 patients stayed 5 days or less. There was no mortality but morbidity in 6 cases included one visceral injury repaired intra-operatively, one self-limited rectal bleed, one laparotomy for small bowel perforation, 2 bowel obstructions (1 requiring laparoscopic revision of anastomosis and 1 open adhesiolysis) and one case of prolonged ileus.

\textbf{Conclusion:} Good patient outcomes can be obtained in the early phase of Laparoscopic Colorectal Surgery with minimal morbidity. Laparoscopic skills can successfully be transferred to Laparoscopic colorectal surgery with focused training from LAPCO.

\textbf{Key statement:} The experience gained by our team in providing a Laparoscopic Colorectal service in keeping with NICE guidelines, supported by focused training from LAPCO, provides an illustrative model in transferring existing laparoscopic skills to Colorectal surgery in combination with the enhanced recovery principles towards good patient outcomes.
POSTER 10

TRANS-ANAL ENDOSCOPIC OPERATION IS AN ALTERNATIVE TO MAJOR RESECTION FOR SELECTED PATIENTS WITH LARGE RECTAL LESIONS

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University Hospital of North Tees, Stockton on Tees, United Kingdom

Introduction: Treatment of rectal lesions unsuitable for EMR can be a challenge and trans-anal endoscopic operation (TEO) can be a valuable alternative for some patients. We would like to report our results of TEO for large rectal lesions.

Methods: A prospective descriptive study of patients who had a TEO for symptomatic large rectal polyps or tumours over the last two years. A rectoscope with standard laparoscopic imaging system and carbon dioxide insufflation (KARL STORZ) was used. All patients had pre-operative MRI and intra-operative endo-anal ultrasound prior to the procedure. A dedicated pathology team analysed the specimens.

Results: Twenty nine patients underwent TEO for early rectal cancer or large benign tumours. Common presenting symptoms were rectal bleeding, mucous discharge and tenesmus. Twelve of the fourteen cancer patients had a pre-operative histology for malignancy. The mean operating time was 94 minutes (70-120). The median distance from the anal verge was 7cms (2-12cms). The mean size of the tumour was 59mm (15-120). The median length of hospital stay was 1 day. All patients had complete excision except 2 patients where margin was <1 mm and were considered as R1 resections. Four patients had anterior resections due to T1 Sm3 or T2 disease. There were no major peri-operative complications.

Conclusion: TEO achieved the therapeutic outcomes and good relief of symptoms for patients with benign rectal tumours and a majority of the early rectal cancers. There was no limitation to pursue resection surgery in fit patients. Unfit patients can achieve good relief of symptoms without major surgical resection.

Key statement: Transanal Endoscopic Operation is a better therapeutic option for patients with large benign rectal tumours and also for majority of patients with early rectal cancers. Full thickness rectal wall excision by this procedure is very safe and a major surgical resection can be avoided in selected patients.
DA VINCI SURGICAL SYSTEM VERSUS STANDARD LAPAROSCOPIC TRAINING BOX: A PERFORMANCE COMPARISON OF NOVICES COMPLETING A SIMPLE TASK

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Introduction: The introduction of the da Vinci Surgical System (dVSS) generates exciting new prospects in surgical training. The aim of the study is to compare the performance of novices using the da Vinci System with a conventional laparoscopic training box (CLTB) to perform a standardised task.

Methods: Randomised controlled trial. 28 junior doctors with minimal laparoscopic experience were randomly allocated to perform a standardised task using the dVSS or CLTB. Task completion time was recorded. Candidates then completed the task on the alternative apparatus. Participants completed a questionnaire regarding ease of use and enjoyment for each device.

Results: On average novices performed the task faster using the dVSS (mean 75.5 secs) compared with the CLTB (mean 205.5 secs) (p=<0.00001.)

The dVSS was rated ‘very easy’ or ‘easy to use’ (86% of candidates) and ‘very enjoyable’ or ‘enjoyable’ (75%). Results for the CLTB were 18% and 14% respectively.

Conclusion: The dVSS enables novice trainees to perform simple simulated tasks faster compared with the CLTB. Novices perceive the dVSS to be easier and more enjoyable. The ease of skill acquisition by novices could impact on the future of surgical training and gold standard modality selection for minimally invasive surgical procedures.

Key statement: The da Vinci Surgical System generates exciting new prospects in surgical training. This RCT shows that novices can perform a simple simulated task faster using the da Vinci System than with the conventional laparoscopic training box. Candidates found the da Vinci System significantly easier to use and more enjoyable.
POSTER 12

LAPAROSCOPIC CHOLECYSTECTOMY: A REVIEW OF PORT-SITE HERNIAS

David Bunting

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Introduction: Port-site hernia is a rare but potentially serious complication of laparoscopic cholecystectomy, which has been reported to cause bowel obstruction, strangulation and perforation. This study aims to review current literature, calculate the incidence and identify the causes of port site hernias, to highlight methods for reducing the risk.

Methods: A systematic search of the literature published between 1995 and 2010 was conducted to identify all reports of port-site hernia following laparoscopic cholecystectomy. Studies containing at least 100 patients were identified before application of defined exclusion criteria. The overall incidence of port-site hernia was calculated and predisposing factors reviewed.

Results: Seven studies met the criteria, with a total of 99 port-site hernias in 5984 patients. The overall incidence was 1.7% (range 0.38%-5.4%). Most important factors were older age, higher body mass index, pre-existing hernia, trocar design, trocar diameter, increased duration of surgery and extension of the port-site for gallbladder extraction.

Conclusion: The incidence of port-site hernia depends on multiple variables. Awareness of the predisposing factors and modification of techniques can minimise the risk. Suggestions for reducing the incidence are described. In subsequent multivariate analyses, factors such as fascial closure and whether port incisions were extended need to be included.

Key statement: Port site hernia is a rare but potentially serious complication of laparoscopic cholecystectomy. A systematic literature search was conducted with application of specific inclusion and exclusion criteria. Seven studies included a total of 99 hernias in 5984 patients. Predisposing factors were identified and suggestions for reducing the risk are described.
A REVIEW OF ANALGESIC REQUIREMENTS OF PATIENTS UNDERGOING LAPAROSCOPIC AND ROBOTIC COLORECTAL CASES IN A DISTRICT GENERAL HOSPITAL

Rachael Carnell, Kenneth Keogh, Jane Watson, Stephen Mitchell, Nicholas Kenefick

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Introduction: In 2009 an Intuitive Da Vinci™ robot was purchased by the hospital league of friends. There has been a change in analgesic practice and requirements since it has been in operation. We have reviewed our practice for laparoscopic and the first Da Vinci™ robotic colorectal cases performed.

Methods: Prospective data of colorectal patients for the enhanced recovery programme has been entered since 2005. This database was used to identify conventional laparoscopic cases performed by the two surgeons undertaking robotic surgery. These patients were compared with patients from the Da Vinci™ database to assess analgesic requirements.

Results: 153 laparoscopic colorectal cases between 2005 and 2010 were identified: 74 female, 79 male with a median age of 68.7. 47 robotic cases between 2009 and 2010 were identified: 21 female, 26 male with a median age of 65.94.

<table>
<thead>
<tr>
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<th>Laparoscopic Patients</th>
<th>Robotic Patients</th>
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<tbody>
<tr>
<td>Patients given IV opiates</td>
<td>9.8 %</td>
<td>1</td>
</tr>
<tr>
<td>Mean number IV Opiate doses</td>
<td>2.8 (1-9)</td>
<td>2</td>
</tr>
<tr>
<td>Patients given Oral Opiates</td>
<td>41.83%</td>
<td>44.68%</td>
</tr>
<tr>
<td>Mean number oral opiate doses</td>
<td>4.14 (1-26)</td>
<td>3.86 (1-14)</td>
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<tr>
<td>Patients given IV Paracetamol</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Patients given NSAIDs</td>
<td>60.78%</td>
<td>46.81%</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>57.52%</td>
<td>46.81%</td>
</tr>
<tr>
<td>Diclofenac</td>
<td>3.27%</td>
<td>0</td>
</tr>
</tbody>
</table>

A two tailed fisher test was carried out on the use of epidurals, TAP blocks and PCAs.

<table>
<thead>
<tr>
<th></th>
<th>Laparoscopic Patients</th>
<th>Robotic Patients</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidurals</td>
<td>49.02%</td>
<td>12.77%</td>
<td>0.001</td>
</tr>
<tr>
<td>Mean epidural removal day</td>
<td>2.45 (0-5)</td>
<td>2.00 (1-3)</td>
<td></td>
</tr>
<tr>
<td>TAP block</td>
<td>23.53%</td>
<td>72.34%</td>
<td>0.0001</td>
</tr>
<tr>
<td>PCA</td>
<td>47.05%</td>
<td>68.09%</td>
<td>0.0127</td>
</tr>
</tbody>
</table>

Conclusion: Introduction of the Da Vinci™ robot has seen a change in post-operative analgesia, subjectively there is a decrease in pain levels experienced. We have demonstrated a statistically significant reduction in epidurals used and increase in TAP blocks and PCAs. There have been changes in the use of opiates and NSAIDs.
Key statement: A review of the first 47 Intuitive Da Vinci™ robotic colorectal cases and 153 laparoscopic colorectal cases looking at patient analgesic requirements demonstrating a statistically significant reduction in the use of epidurals, increase in TAP blocks and PCAs. There have been small changes in oral and IV drugs used post-operatively.
EXTENDED THROMBOPROPHYLAXIS IN LAPAROCOPIC COLORECTAL SURGERY: A NATIONAL SURVEY OF CURRENT PRACTICE AMONGST SURGEONS IN THE UNITED KINGDOM

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Poole Hospital NHS Trust, Poole, Dorset, United Kingdom

Introduction: To examine current practice regarding VTE prophylaxis amongst UK laparoscopic colorectal surgeons, with particular reference to the new NICE guidelines.

Methods: We identified surgeons listed on a data base held with Association of Surgeons of Great Britain and Ireland and performed a cross sectional survey with regard to their current practice.

Results:

Inpatient VTE Prophylaxis

97/101 (96%) used inpatient LMWH up to the day of discharge. 1/101 (1%) used conventional Heparin. 3/101(3%) used mechanical prophylaxis alone, with pneumatic compression stockings peri-operatively and TED®s until discharge. Pneumatic compression devices were used peri-operatively by 32/101 (32%). TED®s were utilised by all the surgeons who responded, 79 (78%) below knee & 22 (22%) above knee.

Extended VTE Prophylaxis

Overall extended prophylaxis was offered either mechanically or pharmacologically by 24/101 (24%). Extended VTE prophylaxis with LMWH alone was offered by 12/101 (12%), with a median duration of 28 days (range 1-42). Extended prophylaxis using TED®s alone was offered by 11/101 (11%) with a median duration 15 days (range 5-42).

Conclusion: Our survey does highlight variation in practice amongst surgeons regarding VTE prophylaxis and that NICE guidelines are not always followed. Currently, no RCT have been performed looking specifically at laparoscopic surgery and VTE risk. If NICE guidelines are not followed, a clinician will need to have a robust clinical reason and/ or supporting evidence to justify their practice.

Key statement: The importance of VTE prophylaxis in high risk patients undergoing cancer resection is well known. There is little consensus amongst laparoscopic colorectal surgeons as to the regime offered and whether to give extended prophylaxis after patient discharge. We examine current practice regarding VTE prophylaxis amongst UK laparoscopic colorectal surgeons.
POSTER 15

Spinal analgesia in an enhanced recovery program for laparoscopic colorectal resection: how does it compare to epidural and other techniques?

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Introduction: Post-operative opiate use and epidural analgesia have both fallen from favour with enhanced recovery regimes for laparoscopic colorectal resection surgery. The use of spinal analgesia has become more common. Spinals, like epidurals, produce a central axial blockade (CAB) with subsequent physiological implications. We were interested in how the post-operative course for patients with spinals compared to those with epidurals and those with no central axial blockade.

Methods: Our prospective database of patients undergoing laparoscopic colorectal resection was analysed.

Results: The spinal group received significantly less fluid over the time period Day 0 to Day 1, than the epidural group (Median 5.6L compared with 8.0L, 2 tailed P=0.049). There was no significant difference between patients with spinals compared with those with no CAB

Significantly fewer of the spinal group received post-operative opiates, compared to the epidural group. (10/23 compared to 8/8, P=0.011, 2 tailed Fisher exact test.)

Pain scores were significantly lower in the spinal group (Median 1.7, IQR 2.9, n=22) compared to the group with no central axial blockade (Median 5.7, IQR 4.6, n=14, 2 tailed P=0.017).

Conclusion: Spinals do not appear to be associated with the increased post-operative fluid use of epidurals, but may offer lower post-operative opiate requirements. They are associated with improved pain scores compared to those with no CAB.

Key statement: Laparoscopic surgery combined with enhanced recovery for colorectal resection is now widely accepted and has significant benefit to the patient. Paramount to this success is the provision of adequate analgesia without adversely affecting outcome. We report on our experience with spinal anaesthesia and its advantage over alternative methods.
A COMPARISON OF SINGLE INCISION LAPAROSCOPIC SURGERY WITH A STANDARD LAPAROSCOPIC APPROACH TO COLORECTAL RESECTIONS

Salvatore Guarino, Ayan Banerjea, Yasser Ghanem, Mohammad Rafiz Imtiaz, Umberto Morelli, Shafi Ahmed

Royal London Hospital, London, United Kingdom

Introduction: Newer technical advances, such as multi-channel ports and articulated instruments, has allowed surgeons to carry out complex procedures via a single umbilical incision. Single incision laparoscopic surgery (SILSTM) has the potential of playing an important role in the evolution of minimally invasive surgery and we present our experience of colorectal surgery using the SILSTM port

Methods: We have performed twelve major colorectal surgical procedures between June 2009 and August 2010 including right, left colectomies, anterior resection, small bowel resection, subtotal colectomy, and restorative proctocolectomy.

These patients were compared with twelve matched cases who underwent multiple incision laparoscopic surgery (MILS) for colectomies during the same period. Short term data are available between the two groups.

Results: Twelve patients underwent successful SILSTM colectomies with no conversions nor major intra- or post-operative complications. Operating time ranged from 126 -346mins (MILS 105 – 320mins) and inpatient stay ranged from 3-12 days (MILS 3-11 days). 1 patient developed a post-operative ileus and 1 encountered minor PR bleeding in the SILSTM group. In the MILS group, one patient required post-operative blood transfusion, one developed a pelvic collection and one developed a surgical site infection. The maximum incision length in the SILSTM patients was 3.5cm and at outpatient follow-up all of them had no visible scar

Conclusion: SILS colectomies are safe surgical procedures and comparable to the standard MILS approach. The outcomes are similar but there is an improvement in cosmesis and post-op pain. SILSTM may become the standard surgical approach in patients with suitable colorectal pathology

Key statement: Single incision laparoscopic surgery (SILSTM) has the potential of playing an important role in the evolution of minimally invasive surgery and we present our experience of colorectal surgery using the SILSTM port. SILSTM may become the standard surgical approach in patients with suitable colorectal pathology
POSTER 17

LAPAROSCOPIC COLORECTAL SERVICE BY A NEW CONSULTANT IN A TERTIARY REFERRAL UNIT

Salvatore Guarino, Mohammad Rafiz Imtiaz, James Howard, Yasser Ghanem, Hana Ahmed, Umberto Morelli, Shafi Ahmed

Royal London Hospital, London, United Kingdom

Introduction: Laparoscopic colorectal surgery has now established itself as the gold standard for the treatment of both benign and malignant colorectal disease. We report on our experience in instituting a new laparoscopic colorectal service in a Tertiary Referral Unit.

Methods: A retrospective analysis was carried out on all patients undergoing laparoscopic colorectal resections by a single laparoscopic colorectal surgeon from Sept 2007 to September 2010. Ninety-three cases were carried out in total including 12 of which were performed via SILS technique. This includes 54 patients with CRC, 10 diverticular disease, 19 inflammatory bowel disease (7 UC and 12 Crohns), 4 polyps, 5 rectal prolapse, 1 sigmoid volvulus. Operations performed: small bowel resection (5), right hemicolecotomies (30), extended right hemicolectomy (8), left hemicolectomy (3), Hartmans (3), reversal of Hartmans (3), rectopexy (5), restorative proctocolectomy (2), APER (3), anterior resections (21-including 5 synchronous laparoscopic liver and rectal resections).

Results: There were no deaths and only two (2.1%) conversions. The first involving a locally advanced caecal tumour and the other was a rectal cancer in a patient who had undergone previous radical radiotherapy for prostate cancer. There were two anastomotic leaks (2.1%). The first from a right hemicolecotomy requiring a laparotomy and the other from an extended right hemicolecotomy requiring radiological drainage. 2 port site hernias: 1 large bowel obstruction (due to adhesions): 1 tight ileostomy requiring revision and 2 pelvic collections requiring radiological drainage.

Conclusion: A laparoscopic colorectal service can be successfully developed in a tertiary referral unit with a low conversion rate and low rates of mortality and morbidity.

Key statement: A laparoscopic colorectal service can be successfully developed in a tertiary referral unit with a low conversion rate and low rates of mortality and morbidity.
GO HOME! WE'RE FAILING ON DAY-CASE LAPAROSCOPIC CHOLECYSTECTOMY

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Introduction: Recent papers demonstrate day-case rates of up to 86% although Hospital Episode Statistics data reveals that less than 20% of around 60000 cholecystectomies performed nationally in 2008 were day-cases. This study assesses the performance of a district general hospital and attempts to identify causes for unplanned admissions following elective LC.

Methods: All elective LC episodes over a 4-month period were analysed. Demographic, operative and admission data were collected prospectively and retrospectively. The student t-test and χ² tests were used for analysis and identification of any significant differences.

Results: 74 patients were admitted for elective LC. There were 39 (53%) unplanned overnight admissions; 11 of which were due to drain placement. Unplanned overnight admission was not statistically associated with gender, age, ASA-score, BMI, grade of surgeon or operative duration, but was more likely with later operative start-time (p=0.0053).

Conclusion: Only 47% of the elective LC were day-case. Unplanned admission following elective LC is well multi-factorial, however, in this study drain placement was the single commonest reason, yet the BADS recommends that drains may be removed several hours post-operatively and need not preclude discharge.

Key statement: In order to increase day-case rates we must consider appropriate use and removal of drains and address operating-list design to ensure LC is started earlier in the day. The reason for any unplanned admission must be documented in 100% of the cases.
CONSENT FOR LAPAROSCOPY: WHO IS TELLING PATIENTS WHAT? SHOULD TRAINEES TAKE A FORMAL ASSESSMENT OF COMPETENCY TO CONSENT FOR LAPAROSCOPY?

Natalie Hirst, Julia Massey, Adeshina Fawole

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Introduction: To compare variation in consenting practice between surgeons for acute diagnostic laparoscopy/laparoscopic appendicetomy with specific reference to the documentation of risks of surgery.

To assess the need for a formal assessment of competency in obtaining consent for surgical trainees.

Methods: Prospective case notes review assessing the consent forms of all 51 patients over the age of 16 undergoing acute diagnostic laparoscopy or laparoscopic appendicetomy at our unit between 1st April 2010 and 31st July 2010.

Results: Consent was taken by SHOs(61%), SPRs(37%), consultants(2%).

Procedures performed by SHOs(8%), SPRs(82%), consultants(10%).

Risks of bleeding and infection were discussed with 100%.

Patients were not warned of risk of damage to intraabdominal organs in 10%, potential for conversion in 4% and possibility of transfusion in 63%.

Conclusion: A wide variation in consenting practice for laparoscopy is seen. In our study, the majority of consent was taken by junior trainees who did not subsequently perform the procedure. Omissions or inconsistencies in informed consent leave the operating surgeon vulnerable and important information may not be communicated to patients.

Key statement: Surgeons must check consent before they operate, if not done by themselves. There must be facilities for adequate training of juniors in consenting laparoscopic procedures. We propose the use of a formal assessment of competency to consent to achieve this.
A SINGLE SURGEON’S EXPERIENCE OF LAPAROSCOPIC COLORECTAL SURGERY IN DISTRICT GENERAL HOSPITAL

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Introduction: The aim of this study was to assess the outcome of Laparoscopic Colorectal Surgery for both benign and malignant disorders. The specific emphasis was to identify the impact of the learning curve on improving the outcome of LCR surgery and also to compare the results with NICE guidelines.

Methods: A prospective database was established for first 100 consecutive patients undergoing laparoscopic colorectal surgery by one surgeon. The main outcome measures assessed were operative duration, conversion rate, length of hospital stay, morbidity and mortality. Data was collected from the case notes and electronic data base.

Results: Patients were consented according to NICE Guidelines. Selection criteria and pre-operative staging were as per protocol. Average Hospital stay was 8 days. Median operative duration was 226mins. Post operative morbidity and mortality rates were 7% and 1% respectively. Conversion rate has reduced from 26% to 20% with increased expertise.

Conclusion:

It is safe and feasible for an experienced open surgeon to learn laparoscopic surgery with preceptorship. Also expect long operating time and high conversion rate in the beginning.

Key statement: Laparoscopic colorectal surgery could be performed safely by surgeons during learning curve.
INITIAL RESULTS OF THE FIRST FIFTY PATIENTS UNDERGOING ROBOTIC COLORECTAL SURGERY IN A DISTRICT GENERAL HOSPITAL

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Introduction: Robotic surgery offers potential technical advantages over conventional laparoscopic surgery. We believe that this advantage may improve patient outcome. We present the early results of our first 50 robotic colorectal procedures.

Methods: From October 2009 to September 2010 two consultants performed 50 robotic procedures. Median age was 67 years (range 49 – 78 years), 22F:28 M, ASA grade (2, 1 - 3). These included 4 abdomino-perineal resections, 19 anterior resections, 6 left hemicolecotomies, 2 transverse colectomies, 17 right hemicolecotomies, and 2 sacro-colpopexies.

Results: Median surgical time was 200(129–405) minutes with 10.2%(5 patients) open conversions. 70% had an intra-operative TAP block with 6 patients (12%) requiring epidural analgesia. 35(71%) patients required a PCA and 9 (17%) oral analgesia only. Median hospital stay was 5(2-21) days. Major complications occurred in 6%(3), minor in 24%(12).

Conclusion: Initial results for our first 50 cases suggest that Robotic surgery is applicable to colorectal surgery. Time to discharge appears early with an apparent trend for less postoperative analgesia. Operative times are not increased once the early learning curve is overcome. Morbidity appears to be similar to conventional surgery.

Key statement: Robotic colorectal surgery has potential technical advantages over conventional laparoscopic surgery. We aim to show that the adoption of robotic colorectal surgery results in early discharge times with less analgesic requirement than laparoscopic surgery with no increase in morbidity.
POSTER 22

LAPAROSCOPIC RESECTION OF RECTAL TUMOURS RESULTS IN IMPROVED FUNCTIONAL OUTCOMES AS COMPARED WITH OPEN SURGERY IN MEN

Omar Khan, Emma McGlone, Karen Flashman, Jim Khan, Daniel O’Leary, Asha Senapati, Amjad Parvaiz

Queen Alexandra Hospital, Portsmouth, United Kingdom

Introduction: Previous studies have suggested that laparoscopic resection of rectal tumours in men is associated with poorer post-operative urinary and sexual function as compared with open surgery. We compared the functional outcomes of open and laparoscopic resections in our high-volume unit.

Methods: Between 2006 and 2009, all male patients who underwent either a laparoscopic or open elective procedure for rectal cancer were identified from a prospectively collated database. All 109 surviving patients were sent a postal questionnaire with standardised questions about their urinary and sexual function before and after surgery. This functional data were then quantified using previously validated indices of urinary and sexual function. The changes in functional status following open and laparoscopic surgery were then compared.

Results: Of the 91 responders, 53 had laparoscopic procedures and 38 open surgery. Both open and laparoscopic surgeries were associated with significant deteriorations in both urinary and sexual function. With reference to urinary symptoms, overall functional status was similar in the two groups. However with reference to male sexual function, the incidence of successful penetration was higher in the laparoscopic group (p=0.04) and there was also a trend towards improved overall sexual function (p=0.08) in the laparoscopic group.

Conclusion: Laparoscopic resection of rectal tumours results in improved preservation of post-operative sexual function as compared with open surgery.

Key statement: Laparoscopic resection of rectal tumours results in improved preservation of post-operative sexual function as compared with open surgery.
POSTER 23

LAPAROSCOPIC RESECTIONS FOR BENIGN INFLAMMATORY DISEASES OF THE COLON- REALLY A CONSULTANT CASE?

Omar Khan, Frances Howse, Karen Flashman, Jim Khan, Amjad Parvaiz

Queen Alexandra Hospital, Portsmouth, United Kingdom

Introduction: Although a number of studies have examined the outcomes of laparoscopic colonic resections for benign inflammatory diseases, the impact of training on outcomes in these patients has not yet been investigated. The purpose of this study was to assess the feasibility and quantify the effect of training on peri-operative outcomes in laparoscopic colonic resections for benign inflammatory diseases.

Methods: Between 2006 and 2010, all patients who underwent elective laparoscopic colorectal resection for benign inflammatory disease by two surgeons were identified from a prospectively collated database. Cases were performed either by consultant surgeons or trainees operating under direct supervision. The proportion of cases performed by trainees was recorded and the seniority of the operating surgeon related to peri- and post-operative outcomes.

Results: Of the 104 cases, 66 were performed by consultants and 38 by trainees. Consultants were more likely to perform technically demanding cases as compared with trainees as evidenced by the higher proportion of patients who had undergone previous surgery (38% vs. 21%) and the higher proportion of patients requiring proctectomy (23% vs. 3%) in the consultant group. However the incidence of anastomotic leak (3% vs 5%); in-patient mortality (0% vs 0%); need for re-operation (6% vs 8%) and emergency readmission rate (14% vs 16%) were similar in both groups.

Conclusion: Supervised trainees can successfully undertake appropriately selected laparoscopic colorectal resections for benign inflammatory disease with no detrimental effects on overall hospital costs and post-operative morbidity.

Key statement: Supervised trainees can successfully undertake appropriately selected laparoscopic colorectal resections for benign inflammatory disease with no detrimental effects on overall hospital costs and post-operative morbidity.
POSTER 24

A SIMPLE TECHNIQUE FOR CANNULATION OF THE JEJUNUM DURING LAPAROSCOPIC FEEDING JEJUNOSTOMY

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Introduction: Laparoscopic insertion of a feeding jejunostomy is a common but technically demanding operation. One of the most difficult aspects is the percutaneous cannulation of the jejunum. Whilst previous authors have described techniques involving laparoscopic insertion of a purse string suture around the entry site of the jejunum, this can be technically challenging and time consuming. We describe our experience of a simple technique for this step in the procedure.

Methods: A 2.0 polyglactin suture on a straight needle is inserted through a 2mm skin incision into the peritoneal cavity and two separate bites are made on the antimesentric border of the proximal loop of bowel. A suture passer is then used to pull the needle out through the skin incision. This technique is repeated on a distal segment of bowel. The two sutures are pulled up towards the abdominal wall and the metal introducer for the feeding catheter inserted through the abdominal wall. The jejunum is then cannulated under vision with the two sutures held under tension to prevent the bowel from falling away from the anterior abdominal wall. The feeding catheter is inserted under vision to ensure the catheter is advanced distally and the sutures are then tightened and tied trans-fascially allowing the feeding tube to lie in snug tunnel.

Results: Between April 2010 and August 2010 this technique has been performed on 19 consecutive patients with no tube-related complications or blockages.

Conclusion: Our technique obviates the need for laparoscopic suturing and is quick, simple and effective.

Key statement: We describe our experience of a simple technique for laparoscopic insertion of feeding jejunostomies which obviates the need for laparoscopic suturing and is quick, simple and effective.
POSTER 25

LAPAROSCOPIC ANTERIOR GASTROPEXY FOR THE TREATMENT OF GASTRIC VOLVULUS - A CASE SERIES

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Darlington Memorial Hospital, Darlington, County Durham, United Kingdom

Introduction: Gastric volvulus is an uncommon condition first managed by laparoscopic anterior gastropexy in 1992. There is limited published data recording routine use of this procedure. We present our experience to demonstrate laparoscopic anterior gastropexy as a safe and effective treatment for gastric volvulus.

Methods: Retrospective and prospective data was gathered for patients who underwent a laparoscopic gastropexy in a 24 month period (August 2008 – August 2010). Case notes were scrutinised for admission data, ITU stay, operative details, and complications.

Results: Twenty patients (aged 63-96) were identified with a median ASA of 3. The average operative time was 70 minutes (range 35-90) and all were immediately extubated. The median hospital stay was 3 days (range 1-39). Complications included two chest infections and one partial recurrence. At 8 weeks all were symptom-free.

Conclusion: Gastric volvulus causes significant morbidity with repeated admissions. Laparoscopic anterior gastropexy is a safe and effective method of managing this condition even in patients of advanced age with significant co-morbidities.

Key statement: There is limited published data on the surgical treatment of gastric volvulus in adults. These patients are often elderly with multiple co-morbidities. Our experience shows that laparoscopic anterior gastropexy is a safe and effective way of managing this condition.
POSTER 26

MANAGEMENT OF BILE DUCT CALCULI IN PATIENTS POST LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS SURGERY

John Loy, Dimitrios Pournaras, Ahmed Hamouda, David Mahon, Richard Welbourn

Dept of Bariatric Surgery, Musgrove Park Hospital, Taunton, United Kingdom

Introduction: Rapid weight loss following laparoscopic Roux-en-Y gastric bypass (LRYGB) for obesity can lead to the formation of gallstones. Current evidence does not support prophylactic simultaneous cholecystectomy in this patient group. Those who develop gallstones complicated by calculi in the common bile duct pose a particular problem for surgeons as the transoral route for ERCP is no longer available. Alternative methods and routes of access for bile duct cannulation are now utilised, the most popular of which is laparoscopic transgastric ERCP. We review the literature assessing laparoscopic transgastric ERCP.

Methods: A Pubmed search was performed and all case reports, case series and reviews examined. Complication rates, successful duct cannulation and bile duct clearance rates were recorded.

Results: 17 papers were reviewed consisting of 82 patients who had undergone laparoscopic transgastric ERCP post LRYGB. Complication rates were low <5% and consisted of complications associated with laparoscopic surgery in general. Successful cannulation of the common bile duct was high at 94%.

Conclusion: This method of accessing the extrahepatic biliary system in this group of patients is safe, successful and associated with few complications. As bariatric surgery grows in popularity and with an increasing volume of patients choosing LRYGB the ability to perform trans gastric ERCP is a useful skill.

Key statement: Rapid weight loss following gastric bypass surgery for obesity can lead to the formation of gallstones. Those who develop stones in the common bile duct pose a particular problem as transoral ERCP is not now an option. Laparoscopic transgastric ERCP is increasingly utilised and we aim to assess its value.
POSTER 27

LAPAROSCOPIC ADJUSTABLE GASTRIC BAND PLACEMENT IN A PATIENT WITH SITUS INVERSUS

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Introduction: As surgery for morbid obesity becomes more commonplace, the chance of bariatric surgeons encountering patients with anatomical anomalies increases. We describe the operative laparoscopic approach employed to perform laparoscopic gastric band placement in a patient with situs inversus totalis.

Methods: An obese lady underwent laparoscopic gastric band placement electively. Ports were placed in mirror image to routine procedure and dissection carried out using the pars flaccida technique. The gastric band was placed around the upper stomach.

Results: There are two reports in the literature of laparoscopic adjustable gastric band placement\(^1\), one of a sleeve gastrectomy\(^2\) and one of a Roux-en-Y gastric bypass\(^3\) performed on patients with situs inversus totalis. This case publishes the intraoperative photographs showing the anatomical variation and the steps taken to deal with this.

Conclusion: With a prevalence of 1:8000 and rising numbers of bariatric operations being performed, a knowledge of situs inversus totalis and the ability to adapt the laparoscopic approach to suit these cases is invaluable.

Key statement: As surgery for morbid obesity continues to grow in popularity, bariatric surgeons will encounter patients with anatomical anomalies. Situs inversus totalis is one such condition and we present a case with photographs of laparoscopic adjustable gastric banding carried out in an obese lady.
Introduction: Gastrograffin swallows (GGS) are often used to detect anastamotic leaks following Laparoscopic Roux-en-Y Gastric Bypass surgery (LRYGB). The routine use of such studies has been debatable. We propose that a well placed surgical drain and careful clinical follow-up eliminates the need for routine GGS post surgery.

Methods: Case notes and imaging for 68 patients who underwent consecutive LRYGB surgery for obesity in a district general hospital between April 2005 and December 2009 were retrospectively reviewed. All LRYGB patients in our unit have drains placed at the Gastro Jejunal anastamosis and are tested for leaks intraoperatively with Methylene Blue coloured solution.

Results: Four patients were found to have anastamotic leaks, despite negative intraoperative methylene blue leak test. Routine post-operative GGS failed to detect anastamotic leaks in 3 patients. In all cases where there was radiological evidence of a leak, there was already an index clinical suspicion of a leak (Gastric contents/oral fluids in the drain). All anastamotic leaks were managed conservatively with a well positioned drain, parenteral nutrition, allowing the leaks to heal spontaneously. None of them needed surgical or radiological intervention.

Conclusion: Routine GGS post LRYGB does not detect all anastamotic leaks and can be falsely reassuring. A well placed surgical drain kept in place for 12 hrs after oral fluids have commenced and careful clinical review remove the need for routine GGS.

Key statement: Gastric bypass. Gastrograffin swallow. Unnecessary test.
Introduction: Laparoscopic insertion of Peritoneal Dialysis (PD) Catheter is a safe and efficacious method for end stage renal failure. PD is also notorious for high rates of infections and other complications. We audited the results over 2 years to identify the problems associated and how they could be overcome.

Methods: Retrospective case notes study done for 30 procedures over 2 years. Results collected for eGFR at referral, time to insertion of PD, infections – early and late, other complications, final outcomes and catheter patency rates. These were then compared to NICE guidelines 2007 for comparison.

Results: 25 new and 5 repeat laparoscopic placement done. PD placed within mean 7.7 weeks of referrals. Complications were early wound infections (<4 weeks) 3, late PD peritonitis 14, Leakage 6, Blocked 10, Overgranulation 2, fluid overload 2, hernia 3, poor dialysis 2, diarrhoea 1, recurrent cystitis 1. 14 PD catheters needed removal.

Conclusion: Laparoscopically placed PD have low early infection rates (<4 weeks). Issues with poor PD uptake are related to proper patient selection, compliance, home management, and management of secondary infections. Advantage is that being a minimally invasive procedure repeated placements can easily be offered.

Key statement: Laparoscopic placement of Peritoneal Dialysis catheters is an attractive alternative to haemodialysis. The laparoscopic procedure itself has low infections and complications, the problems are mostly delayed and related to the management of tube by the renal team. If a tube has to be removed than another can be easily replaced laparoscopically.
POSTER 30
EVALUATING SYSTEMIC STRESS RESPONSE IN SINGLE PORT VS. MULTI-PORT LAPAROSCOPIC CHOLECYSTECTOMY

Colleen McGregor¹, Mikael Sodergren¹, Alec Aslanyan¹, Victoria Wright², Sanjay Purkayastha¹, Ara Darzi¹, Paraskevas Paraskeva¹

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Introduction: Acute-phase proteins and inflammatory cytokines mediate measurable responses to surgical trauma, which are proportional to the extent of tissue injury and correlate with post-operative outcome. By comparing systemic stress following multi-port (LC) and single-incision laparoscopic cholecystectomy (SILC) we aim to determine whether reduced incision size induces a reduced stress response.

Methods: Thirty-five consecutive patients were included, 11 underwent SILC (mean ±SEM; age 44.8±3.88 yrs; BMI 27±1.44 kg/m²) and 24 underwent LC (56.17±2.80 yrs; 31.72±1.07 kg/m², p<0.05). Primary endpoint measures included interleukin-6, tumour necrosis factor-α, C-reactive protein and white cell count measured pre- and post-operatively. Length-of-stay (LOS) and postoperative morbidity were secondary endpoints.

Results: No significant difference was found between SILC and LC in interleukin-6, tumour necrosis factor-α, C-reactive protein, white cell count, LOS and duration of surgery. There was no correlation between systemic stress response and operative parameters. There were no intra-operative complications.

Conclusion: SILC appears to be a safe, feasible technique with potential advantages of cosmesis, reduced incisional pain and well-being recommending its use. These data indicate no difference in systemic stress and morbidity between SILC and LC. A larger, multi-centred, randomised prospective trial is warranted to further investigate and confirm this finding.

Key statement: Single incision laparoscopic surgery (SILS) is technically more challenging than conventional laparoscopic surgery and the true benefits of limiting laparoscopic incisions is yet to be determined. The results of this study indicate that there is no difference between SILC and laparoscopic cholecystectomy in terms of systemic stress response.
POSTER 31

REPAIR OF RECURRENT INGUINAL HERNIA; IS IT THE TIME FOR A CHANGE?

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Introduction: Open repair of recurrent inguinal hernia is challenging and technically demanding due to loss of anatomical planes and adhesions formation from previous surgery. Laparoscopic recurrent inguinal hernia repair avoids these obstacles by dissecting through virgin planes and performing the repair via different anatomical layers and with different anatomical considerations.

Methods: Retrospective study of 53 patients (52 males and 1 female) who had laparoscopic recurrent inguinal hernia repair performed as day-case/short-stay cases by two surgeons over a period of 5 years. Patients with follow-up less than 6 months have been excluded from the study. Data obtained from hospital and theatre database.

Results: Age range (32-80). Cases varied between single previous repair and four previous repairs. Operating time range (22-55 minutes). 6 patients developed post-operative urinary retention, 6 patients had seroma treated with needle aspiration and one patient had haematoma treated conservatively. No hernia recurrence or readmission been recorded.

Conclusion: Laparoscopic surgery was blamed to be difficult and time consuming but our study showed that laparoscopic repair of recurrent inguinal hernia is fast, easy and with better outcome. We strongly recommend any attempt of repairing recurrent inguinal hernia to be performed laparoscopically provided that the laparoscopic expertise is available.

Key statement: Repair of recurrent inguinal hernia is challenging and technically demanding due to loss of anatomical planes and adhesions formation from previous surgery. Our study showed that laparoscopic repair of recurrent inguinal hernia is fast, easy and with better outcome.
POSTER 32
EMERGENCY CHOLECYSTECTOMY SERVICE – PATHWAYS TO CHANGE

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Introduction: “Acute calculus cholecystitis should be optimally managed by laparoscopic cholecystectomy with 96 hours of admission, in order to prevent recurrence and to settle symptoms.”

The aim of this audit was to look at the current practice for the management of acute cholecystitis in Gloucestershire Royal Hospital, compare to the above standard and to put in progress major procedural and mechanical changes to develop an optimal service.

Methods: Notes and computer records of 130 patients who underwent cholecystectomy at Gloucestershire Royal Hospital between the 1st September 2009 and 18th December 2009 were retrospectively reviewed.

Results: 66 out of 130 patients had acute admissions with cholecystitis. 23% had multiple admissions to hospital within the 3 month study period. 72% were sent home to wait for elective surgery. 478 bed days used for acute admissions. Mean wait for surgery for the acute patients remaining in hospital was 2.8 days (60.6 days for all acute patients (including those sent home)). Mean length of stay for operation was 3.3 days. Conversion rate for operation was 2.3%.

Conclusion: This audit showed that patients were waiting too long for surgery, were at risk of multiple admissions and that only 28% were being operated on during their index admission.

Armed with this information, I set up a committee to address the problem and invited the NHS Institute for Innovation to attend. Following this, we streamlined radiology, liaised with emergency departments and bed managers and re-designed the CEPOD list. The new service is being re-audited as data is prospectively captured.

Key statement: This audit highlights a sub-optimal practice for the management of acute gallbladders in a district general. These results stimulated a drive for change and major procedural changes were implemented to optimise the service. New systems are now in place resulting in a more efficient and economical service.
POSTER 33

LAPAROSCOPY AND COMPUTED TOMOGRAPHY IN MANAGEMENT OF EPIPOLOC APPENDAGITIS.

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Introduction: To study the role of laparoscopy and CT scan (Computed Tomography) in managing epiploic appendagitis (EA).

Methods and Results: To our knowledge this is the first case series of EA in the UK.

Case 1: A 24 year old male presented with right sided abdominal pain (AP) with signs suggestive of appendicitis. Laparoscopic appendicectomy was performed but EA was noted and left un-excised. Patient recovered well.

Case 2: A 54 year old female presented with lower AP. She had laparoscopic excision of an inflamed elongated structure in right iliac fossa. Histology showed EA. Three months later patient presented with acute appendicitis confirmed on CT scan. Appendicectomy was performed. Good postoperative recovery.

Case 3: A 42 year old male presented with left renal colic. CT scan clearly demonstrated EA with no other abnormality. He was managed conservatively. Patient recovered well with no further repercussions.

Conclusion: Laparoscopy is an intervention of choice for EA. CT still plays an important role in diagnosis of EA. Surgical excision of EA is controversial.

Epiploic appendagitis is a rare cause of focal abdominal pain in otherwise healthy patients. It can mimic appendicitis, diverticulitis or renal colic on clinical examination. The diagnosis of EA is very infrequent, due in part to low awareness amongst general surgeons. CT is a good non-invasive investigative technique but laparoscopy by an experienced surgeon is replacing all other modalities, especially in cases of uncertain diagnosis.

Key statement: Epiploic appendagitis (EA) is a rare cause of focal abdominal pain. It can mimic diverticulitis, cholecystitis, pancreatitis, urinary tract infections or appendicitis on clinical exam. CT is a good non-invasive investigative technique but laparoscopy is replacing all other modalities.
**POSTER 34**

**LAPAROSCOPIC COLORECTAL SURGERY IS EXPENSIVE FOR HOSPITALS; FACT OR FICTION?**

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**Introduction:** To compare the cost of laparoscopic (LCS) versus open (OCS) colorectal surgery, using figures from the trust finance department considering the following variables: hospital stay (£486/day), critical care (£1426/day), theatre time (£1,131.75/list), disposable instruments, cost of re-operation & general theatre cost.

**Methods:** Analysis of prospective database of patients who had consecutive major elective LCS & OCS (2001-2010). 149 patients had LCS (48% males, median age= 70[17-92] years) & 213 patients had OCS (63% males, median age= 67[20-92] years). Co-morbidities were comparable in both groups. Fisher's exact & student "t" tests were used for statistical analysis.

**Results:**

<table>
<thead>
<tr>
<th></th>
<th>LCS</th>
<th>OCS</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>2.4%(3/126)</td>
<td>6.3%(13/207)</td>
<td>0.18</td>
</tr>
<tr>
<td>Significant Surgical Morbidity</td>
<td>3/126(2.4%)</td>
<td>8/207(3.9%)</td>
<td>0.75</td>
</tr>
<tr>
<td>Wound Infection</td>
<td>10%</td>
<td>15%</td>
<td>0.086</td>
</tr>
<tr>
<td>Mean Operative Time</td>
<td>212 minutes (60-544)</td>
<td>163 minutes (38-354)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HDU/ITU Admissions</td>
<td>31 days</td>
<td>131 days</td>
<td></td>
</tr>
<tr>
<td>Median post operative stay</td>
<td>5(1-44) 46%≤4days</td>
<td>10(2–104) 5%≤4days</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Re-operation for complications</td>
<td>4.76%(6/126)</td>
<td>4.83%(10/207)</td>
<td></td>
</tr>
</tbody>
</table>

**Conclusion:**

<table>
<thead>
<tr>
<th></th>
<th>LCS</th>
<th>OCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>General theatre utilities</td>
<td>Similar</td>
<td></td>
</tr>
<tr>
<td>Critical Care</td>
<td>£421.1</td>
<td>£903.80</td>
</tr>
<tr>
<td>Theatre time</td>
<td>+£226.35 (51min=20% of theatre list)</td>
<td>-</td>
</tr>
<tr>
<td>Lap. Instruments</td>
<td>+£957.23</td>
<td>-</td>
</tr>
<tr>
<td>Reoperation rate</td>
<td>Almost similar</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>£1,604.68</td>
<td>£903.80</td>
</tr>
</tbody>
</table>

With a difference of £700.88, Laparoscopic Colorectal Surgery is cost-effective once a reduction in hospital stay of 1.4 days is achieved.

**Key statement:** NICE Guidelines 2006 state that the cost of Laparoscopic Colorectal Surgery (LCS) should be similar to or lower than that of Open Colorectal Surgery (OCS) with the control of a conversion rate less than 10%, and if laparoscopic surgery decreases the average length of hospital stay by 4 days.
POSTER 35

RAPID RECOVERY PROGRAMME AND LAPAROSCOPIC APPROACH AS A COST-EFFECTIVE ALTERNATIVE TO THE ENHANCED RECOVERY PROGRAMME

Nader Naguib, Avanish Saklani, Meilyr Dafydd, Peter Mekhail, Nicola Tanner, Mustafa Elshiekh, Ashraf Masoud

Prince Charles Hospital, Merthyr Tydfil, United Kingdom

Introduction: To assess the effect of a basic RRP on the median ward stay following LCR and OCR. Unlike the Enhanced recovery programme (ERP), there is no extra funding, no high caloric drinks and only traditional anaesthetic techniques are used.

Methods: Retrospective analysis of prospectively collected data for patients undergoing LCR and OCR over a 9-year period (2001-2010). 353 resections were performed (151 LCR & 202 OCR). Age, sex, co-morbidities & previous surgery were comparable in both groups. Student’s” test was used for statistical analysis.

Results: In the first 18 months of RRP, median ward stay fell from 11 to 8 days for OCR, but remained static for LCR (6 days). Over the next 36 months, as the number of LCR increased from 37% to 80%, median ward stay decreased for LCR (3 days), but remained static for OCR (9 days).

Conclusion: Considering the time lag for the uptake of the RRP, median ward stay is significantly decreased for LCR but not for OCR (p = 0.00096). The volume of LCR and a simplified RRP may be more important in recovery than a fully funded ERP.

Key statement: In August 2006, we established a rapid recovery programme (RRP) for laparoscopic (LCR) and Open (OCR) colorectal resections irrespective of age, co-morbidities and social circumstances. This programme encompasses education of patients and staff with regards to early mobilisation, feeding and discharge. Drains/tubes & bowel preparation are avoided in most cases.
POSTER 36

THE LEARNING CURVE FOR TEMS

Kathryn Oakland, Nikhil Pawa, Gemma Conn, Rohan Ariyaratnam, Matthew Tutton

Colchester General Hospital, Colchester, Essex, United Kingdom

Introduction: Trans-anal endoluminal microsurgery (TEMS) is a minimally invasive technique, that is increasingly utilised in the UK. TEMS is considered a difficult procedure, associated with a steep learning curve. We aimed to determine the learning curve for TEMS in conjunction with purported benefits such as reduced admission time and operative morbidity.

Methods: A retrospective analysis of prospectively collated, single surgeon database of TEMS procedures between May 2008 and July 2010. Age, sex, procedure time, specimen area, fragmentation, excision speed, distance from dentate line, complications and length of stay were analysed. The learning curve was determined using excision speed (excision time/area of specimen) over the two year period.

Results: 44 cases were included. Mean operating time was 117 minutes (SD-81.67), with a mean specimen size of 16.84cm² (SD-13.08) and 93% non-fragmentation rate. Mean excision rate for lesions at≤5cm was 11.1 min/cm² and 9.91 min/cm² for lesions >5cm (p=0.79). Median stay was 1 day (range-1-32). Serious complications (4%) included fistula formation and colostomy.

Conclusion: TEMS is a useful technique for anal and rectal lesions and is associated with a low fragmentation rate. After fifteen cases there is a decrease in operative time which demonstrates that the learning curve is achievable. Length of stay and complication rates compare favourably with standard colorectal resections.

Key statement: TEMS is a relatively new technique for the resection of low rectal lesions. We examined the learning curve for TEMS. We demonstrate that TEMS has an acceptable learning curve with hospital stay and complication rates that compare favourably with standard colorectal resections.
INTRODUCTION: The aim of this study was to assess the outcome for 84 patients undergoing SPLS TEP inguinal hernia repair at the Royal Surrey County Hospital in Guildford (RSCH). We previously published a series of 16 patients (Agrawal et al 2009), demonstrating the safety and feasibility of SPLS in our cohort.

METHODS: Between 18 October 2008 and 2nd June 2010, we performed 118 hernia repairs on 84 patients (80 male, 4 female) aged between 21 and 89 years (median 61).

Patient demographics, type of hernia, incision length, operating time, complications, postoperative hospital stay and recurrence were recorded retrospectively.

RESULTS: 56 patients had unilateral and 28 bilateral hernias. Operating time was 15-120 minutes (median 35 for unilateral; 45 for bilateral).

Median incision length was 25mm (range 15-40mm).

At follow up (18months-7days) the following were recorded: no mortalities or recurrences; 1 intraoperative complication (major peritoneal excursion) and 9 postoperative complications.

CONCLUSION: The authors’ experience has shown that SPLS TEP inguinal hernia repair is a safe and feasible procedure with minimal post operative complications and short operative time. Further studies are required to assess the long term outcome of SPLS hernia repairs, including postoperative patient satisfaction and quality of life.

KEY STATEMENT: Single port laparoscopic surgery (SPLS) totally extraperitoneal (TEP) inguinal hernia repair is a safe and feasible novel procedure, allowing for effective repairs with minimal complications.
POSTER 38

EARLY LAPAROSCOPIC CHOLECYSTECTOMY IN THE DISTRICT GENERAL HOSPITAL SETTING. IS IT SAFE AND FEASIBLE?

Ioanna Panagiotopoulou, Nicholas C. Carter, Mark C. Lewis, Sudhindra Rao

Dorset County Hospital, Dorchester, Dorset, United Kingdom

Introduction: Early Laparoscopic Cholecystectomy (ELC) is becoming the accepted treatment for the management of acute gallstone disease in specialist centres. It has also been achieved safely in the District General Hospital (DGH) setting. We audited the management of acute gallstone disease in our DGH and set about to see if we could implement ELC safely and effectively.

Methods: A retrospective audit of two years of practice was performed using our hospital computerised systems. Following this, departmental and management guidelines were altered to promote and consider ELC for all suitable patients. A prospective audit of practice was then performed for 6 months.

Results: The first cycle revealed that only 10% of emergency patients admitted with gallstone related disease had ELC. In the second cycle, 63 patients were admitted with acute gallstone disease. 3 died from acute pancreatitis. Only 21 (58%) out of the 36 patients who were deemed suitable, had ELC. 15 (42%) patients had planned delayed laparoscopic cholecystectomy (DLC), with 6 (40%) being readmitted whilst waiting for their elective surgery (all undergoing ELC during their readmission). Conversion rates were similar between all groups. One of the patients having DLC had a bile leak, which settled following Endoscopic Retrograde Cholangiopancreatography (ERCP) and stent insertion.

Conclusion: We were able to significantly increase ELC rates following the implementation of necessary changes. There did not appear to be any difference in conversion or morbidity rates between ELC and DLC. We conclude ELC is safe and feasible in the DGH setting.

Key statement: This audit shows that Early Laparoscopic Cholecystectomy is feasible and safe in the DGH setting. To our experience there was no difference in conversion or morbidity rates between Early and Delayed Laparoscopic Cholecystectomy.
POSTER 39

CHRONIC PAIN POST LAPAROSCOPIC VENTRAL HERNIA REPAIR - A DISTRICT GENERAL HOSPITAL PERSPECTIVE

Adam Peckham-Cooper, James Joel, Simon Graham, Mike Pellen, Clive White

Dewsbury District General, Dewsbury, United Kingdom

Introduction: Laparoscopic ventral hernia repair (LVHR) was first described in 2003 and has become an established procedure to repair ventral abdominal wall hernias. LVHR is widely reported to have superior outcomes when compared with the open technique despite evidence that it is associated with significant post-operative pain particularly in the first month. Limited evidence exists however with regard to ‘chronic’ pain as a result of LVHR, which is not uncommon in our clinical experience.

Methods: All patients who underwent LVHR before January 2010 at one DGH were included. Retrospective data was collected from notes using a standard proforma and further data gathered regarding patient experience and pain-related problems via a telephone questionnaire using standardised questions based on the McGill Pain Questionnaire and VAS(O-100) rating of pain.

Results: 30 of 40 (6 notes unavailable; 4 no LVHR performed) patients identified were included incorporating 12 women and 18 men. Mean age was 65 (range 29-89). All underwent LVHR for incisional hernias arising from a variety of initial operations. 15 patients were repaired using Bard® Sepramesh® and 15 using Bard® Composix® of varying sizes. All meshes were secured using the ProTack™ fixation device. 7(23%) patients reported long standing pain of greater than 1 month. 2 patients required referral to the chronic pain team and 1 patient underwent removal of tacks. Further outcomes are reported.

Conclusion: Chronic pain following LVHR is not uncommon and possibly underreported. Further studies are required to elucidate incidence/prevalence data, causes and management options for patients suffering chronic pain post-LVHR.

Key statement: Incisional hernias are common. Surgery is the treatment of choice and is now increasingly performed using a laparoscopic approach. In our experience chronic pain (lasting greater than 6 months), requiring further intervention/management post-LVHR is more common than reported and poorly understood. We present our experience from a District General Hospital.
**POSTER 40**  
**LAPAROSCOPIC VS. OPEN LIVER RESECTION FOR MALIGNANT LIVER DISEASE. A SYSTEMATIC REVIEW**  
Ahsan Rao, Irfan Ahmed  
Aberdeen Royal Infirmary, Aberdeen, United Kingdom  

**Introduction:** Introduction of minimally invasive techniques in surgery has brought a change in existing surgical practices including liver surgery. There is little agreement about use of laparoscopic surgery for malignant liver lesions as compared to open resection. We aim to analyse all available data comparing both these groups.

**Methods:** All the studies that compared laparoscopic and open liver resections for malignant lesions were searched on various database that included Medline, Ovid, Embase, and Pubmed. All the articles were hand searched and cross referenced. Data was collected and analysed in Review Manager (RevMan) Version 5.0

**Results:** There were total of 10 studies that compared laparoscopic(296/700) and open(404/700) hepatic resections for malignant lesions. Laparoscopic group was associated with reduced number of patients requiring blood transfusion by 0.35[CI 0.20, 0.60], decreased positive resection margin by 0.34[CI 0.16, 0.73] and decreased overall complication rate by 0.43[CI 0.26, 0.73].

**Conclusion:** The laparoscopic group was associated with decreased number of patients requiring blood transfusion, reduced positive resection margins and less overall complication rate than open group. There is still need for level I and II data to compare laparoscopic versus open hepatic resection in malignant lesions.

**Key statement:** The laparoscopic group was associated with decreased number of patients requiring blood transfusion, reduced positive resection margins and less overall complication rate than open group. There is still need for level I and II data to compare laparoscopic versus open hepatic resection in malignant lesions.
LAPAROSCOPIC LEFT LATERAL LIVER RESECTION (LLL) SHOULD BE A STANDARD OPERATION

Ahsan Rao, Ghaus Rao, Irfan Ahmed

Aberdeen Royal Infirmary, Aberdeen, United Kingdom

Introduction: Laparoscopic left lateral liver resection has rapidly gained interest of hepatobiliary surgeons due to the easy accessibility of the left lateral segment. The aim of our study is to gather and analyse available data from the observational studies that have compared laparoscopic versus open left lateral hepatic resection.

Methods: All the studies comparing laparoscopic vs. open left lateral liver resections were searched on the available databases. The studies comparing left lateral liver resections were included in the meta-analysis. Data was analysed using Review Manager software version 5.0.

Results: A total of 7 studies were included in the meta-analysis. There were 245 patients (laparoscopic group n=134, open group n=111). Laparoscopic group was shown to have reduced overall complication rate and operative time of (0.36, (CI [0.20 0.68]) and 48.07 minutes (CI [30.93, 65.21]) than open group (p 0.001). Laparoscopic group had 4.52 days (CI [-8.03, -1.02]) shorter hospital stay than open group (p0.01) but associated with significant heterogeneity between the studies.

Conclusion: Although there are no randomized controlled trials comparing open and laparoscopic LLR, this meta-analysis demonstrates that laparoscopic left lateral sectionectomy is a safe and feasible option. We conclude that it should be conducted routinely in liver centres.

Key statement: Although there are no randomized controlled trials comparing open and laparoscopic LLR, this meta-analysis demonstrates that laparoscopic left lateral sectionectomy is a safe and feasible option. It is associated with reduced overall complication rate. We conclude that it should be conducted routinely in liver centres.
POSTER 42

RIGHT ILIAC FOSSA PAIN IN YOUNG WOMEN – STILL A CHALLENGE FOR THE SURGEON?

Aleksandrs Ribakovs, Nilajana Tewari, Francesca Rumbelow, Megan MacDiarmid, Noman Mahmood, Shantanu Battacharjya

Nottingham City Hospital, Nottingham, United Kingdom

Introduction: Recent evidence suggests that laparoscopy is useful in the diagnosis and management of young women with right iliac fossa pain. We aimed to review the findings in young women presenting to our institution with right iliac fossa pain who underwent diagnostic laparoscopy.

Methods: We performed a retrospective review of 83 adult female patients with right iliac fossa pain who underwent diagnostic laparoscopy. Patient demographics, length of hospital stay, use of preoperative abdominal and pelvic ultrasound scans, complication rate and histology findings were analysed.

Results: 24 patients in this group underwent preoperative pelvic or transvaginal ultrasound scan. Ultrasound identified pathology in 16 (66.7%) patients, while pathology was identified in 74 laparoscopies (89%). Mean hospital stay in the group having preoperative ultrasound was 110 hours and 57 hours in the group having laparoscopy only. The complication rate was 4.8%, comprising 3 superficial wound infections and 1 ileus.

Conclusions: Laparoscopy can be safely used in the investigation and management of young women with right iliac fossa pain. It is useful in the identification of abdominal and pelvic pathology and may help reduce length of hospital stay when used as a diagnostic tool.

Key statement: In young women with right iliac fossa pain routine diagnostic laparoscopy is reliable.
POSTER 43

LAPAROSCOPIC GASTRIC MOBILISATION FOR IVOR LEWIS OESOPHAGECTOMY – NO COMPROMISE IN QUALITY

James Rink¹, David Hewin¹, Martin Wadley²

Royal Gloucestershire Hospital, Gloucester, United Kingdom¹, Worcestershire Royal Hospital, Worcester, United Kingdom²

Introduction: To assess the introduction of laparoscopic gastric mobilisation in Ivor Lewis oesophagectomy by comparing lymph node yields for laparoscopic and open procedures.

Methods: An inquiry was made of all patients undergoing oesophagectomy for adenocarcinoma or squamous cell carcinoma by a single operator within a single centre. A prospective database was used to identify cases. Histology reports were reviewed to assess total and gastric lymph node yields.

Results: 52 patients were identified; 24 had open gastric mobilization and 28 laparoscopic. 20 patients had anatomical breakdown of lymph node numbers recorded in their histology reports. Median [range] total lymph node yield was 21 [8,52] and 26 [7,50] respectively for open and laparoscopic esophagectomy specimens. Median [range] gastric lymph node yields were 10 [7,15] and 14 [6,32] for open and laparoscopic procedures respectively. Wilcoxon rank sum comparison of the lymph node harvest failed to demonstrate superiority of either technique.

Conclusions: Laparoscopic gastric mobilization has produced equivalent lymph node harvest compared to an open procedure. The introduction of laparoscopic techniques to Ivor Lewis oesophagectomy has not compromised the oncological quality of surgery.

Key statement: Laparoscopic gastric mobilization has produced equivalent lymph node harvest compared to an open procedure. The introduction of laparoscopic techniques to Ivor Lewis oesophagectomy has not compromised the oncological quality of surgery.
LAPAROSCOPIC INTRAPERITONEAL ONLAY REPAIR OF INCISIONAL HERNIAS WITH POLYVINYLIDENE FLUORIDE-COATED POLYPROPYLENE MESH; RETROSPECTIVE STUDY FROM A DGH WITH SHORT TERM RESULTS

David Roberts, Suhail Anwar

Huddersfield Royal Infirmary, Huddersfield, United Kingdom

Introduction: Laparoscopic repair of incisional and ventral hernias has increases in popularity due to low recurrence, reduced pain and shorter length of hospital stay. There are a number of composite meshes available, however there are no randomised control trials providing the effectiveness of one over the other. We aim to look at our short term follow up results with one particular mesh.

Methods: We have preformed 38 laparoscopic incisional and ventral abdominal wall hernia repairs. A polyvinylidene fluoride-coated polypropylene mesh (Dynamesh IPOM) was used in all these repairs. Our follow up was limited, with the majority of patients having one follow up clinic appointment with a mean of 90 days. We are in the process of conducting telephone interviews to assess medium term results.

Results: Male to Female ratio was 20:18 with an age range of 27 to 86. Our mean length of stay was 2.5 days. Three patients were seen with seromas that were aspirated. One patient returned with symptoms suggestive of small bowel obstruction, which was successfully treated conservatively. No recurrences were seen in the short-term follow up.

Conclusion: In our series with a short follow up we have not found any major problems with the use of Dynamesh IPOM. The debate about the best composite mesh continues; only a randomised control trials between the different meshes, with long term follow up can determine the true incidence of complications.

Key statement: There are a number of different meshes available on the market for repair of incisional hernias. We have used one particular type (DYNAMESH) with no adverse short term consequences. We are in the process of evaluating our medium term results.
POSTER 45

A PROSPECTIVE AUDIT OF THE EFFICACY OF INTRATHECAL MORPHINE IN LAPAROSCOPIC COLORECTAL SURGERY

Wal Baraza, Ruth Roddison, Amanda Blackburn, Amar Joshi, Richard Slater

Rotherham General Hospital, Rotherham, United Kingdom

Introduction: One of the fundamental principles of enhanced recovery programmes (ERP) is adequate patient analgesia. Most current pathways incorporate the use of epidural anaesthesia in ERPs however there is increasing evidence that spinal anaesthesia may improve short term pain relief. Intrathecal morphine is used selectively in our unit and we aimed to prospectively audit its effectiveness.

Methods: Thirty-seven consecutive patients who received intrathecal morphine were included in the study, 24 of whom had laparoscopic colorectal surgery (LCS). The primary outcome was the need for postoperative parenteral opiate analgesia. Secondary outcomes were postoperative nausea and vomiting (PONV), itching and time to discharge.

Results: Twelve of twenty-four (50%) patients who had LCS had no need for any opiate analgesia within the first 48 hours postoperatively. Of the 12 patients who needed opiates, 5 required patient controlled opiate analgesia (PCA) for a median duration of 28 hours (range 20-78). The median total dose of morphine required in those requiring opiates was 30mg (range 9 – 66). The median time to first dose of opiate was 10 hours (range to ). Only 8 (25%) patients required parenteral opiates postoperatively. PONV occurred in 17% of patients and itching in 8%. The median length of stay in patients requiring opiates vs patients not requiring opiates was 8 (2-16) vs 3 (2-9) days.

Conclusion: Intrathecal morphine is an effective mode of analgesia in laparoscopic surgery. It reduces postoperative opiate requirement which in turn is associated with a reduced postoperative stay.

Key statement: Spinal morphine decreases postoperative parenteral morphine requirement. This is associated with a decreased length of stay.
Experience of single incision laparoscopic colorectal surgery in North Tees Hospital

Ranjit Roy, Bala Bharathan, Ahmed Osman, Talvinder Gill

University Hospital of North Tees, Stockton on Tees, United Kingdom

**Introduction:** Single incision laparoscopic surgery (SILS) is an advanced minimally invasive technique and has been used to perform various procedures including colorectal resections. Though there are some potential cosmetic benefits, no short term or cost-benefit analysis has been conclusively proved over conventional laparoscopic technique. We would like to share our limited experience with colorectal resections using single port technique and standard laparoscopic equipments.

**Methods and Results:** Twenty five patients who were deemed to be suitable for the procedure by the primary operating surgeon (TG) and who gave an informed consented were included. The primary procedure and outcomes are included in Table 1.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of procedures</th>
<th>Operative time (mts)</th>
<th>Blood loss (ml)</th>
<th>Length of hospital stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior Resection</td>
<td>2</td>
<td>160-180</td>
<td>&lt;100</td>
<td>3-4 days</td>
</tr>
<tr>
<td>Sigmoid colectomy</td>
<td>6</td>
<td>100-180</td>
<td>&lt;50</td>
<td>3 days</td>
</tr>
<tr>
<td>Right hemicolecotomy</td>
<td>5</td>
<td>80-130</td>
<td>&lt;50</td>
<td>2-3 days</td>
</tr>
<tr>
<td>Pan proctocolectomy</td>
<td>2</td>
<td>340-360</td>
<td>&lt;100</td>
<td>4 days</td>
</tr>
<tr>
<td>Reversal of hartmanns</td>
<td>4</td>
<td>30-120</td>
<td>20-100</td>
<td>2-3 days</td>
</tr>
<tr>
<td>Total colectomy</td>
<td>1</td>
<td>240</td>
<td>&lt;100</td>
<td>4 days</td>
</tr>
<tr>
<td>Ileocecal Resection</td>
<td>5</td>
<td>70-110</td>
<td>20-100</td>
<td>2-3 days</td>
</tr>
</tbody>
</table>

Table1: Summary of patients who underwent colorectal resection using SILS technique.

We achieved comparable outcomes to conventional multi-port laparoscopic procedure for blood loss and length of stay. Patients who had panproctocolectomy and total colectomy did not have any scars since the stoma was brought through port site.

**Conclusion:** SILS is a relatively new procedure and has a long learning curve. There is still a long way before these techniques are embraced universally.

**Key statement:** Single port laparoscopic colorectal surgery is an advanced minimally invasive and challenging technique. Our limited experience with colorectal resections using single port technique and standard laparoscopic equipments show that it is safe and feasible without any extra cost. The obvious advantage is better cosmesis and patient satisfaction.
POSTER 47

ORIENTATION STRATEGIES IN NATURAL ORIFICE TRANSLUMENAL ENDOSCOPIC SURGERY

Mikael Sodergren, Felipe Orihuela-Espina, Peter Mountney, James Clark, Julian Teare, Ara Darzi, Guang-Zhong Yang

Imperial College, London, United Kingdom

Introduction: Disorientation has been identified as one of the major barriers to be overcome before widespread clinical NOTES uptake. The aims of this study were to: 1) Describe the visual attention strategies employed by surgeons which are associated with high performance in orientation, and 2) Identify key structures guiding attention deployment of the surgeon in the process of orientation in common clinical NOTES scenarios.

Methods: 21 surgeons were shown a series of 8 images acquired during human NOTES operations from the flexible endoscope from different perspectives to induce disorientation. Gaze behaviour was recorded using an eye tracker as the subjects were asked to establish the image orientation. Main outcome measures were times taken to establish orientation and fixation sequences on organs & structures.

Results: High performance subjects had a more structured and focused approach to orientation. Orientation strategies associated with high performance were described using a validated algorithm for comparing visual reorientation behaviour and amount of visual attention on organs & structures in each scenario were quantified.

Conclusion: Targeted orientation strategies revealed in this study are expected to aid in decreasing the learning curve associated with NOTES and increase performance even for experienced surgeons and gastroenterologists. Crucially, this data can provide guidance for designing orientation friendly NOTES platforms.

Key statement: Disorientation has been identified as one of the major barriers to be overcome before widespread clinical NOTES uptake becomes feasible. This study uses eye tracking technology to identify high performance orientation strategies in common clinical NOTES scenarios, with important implications on surgical education and the development of NOTES-specific operating platforms.
OUTCOMES OF LAPAROSCOPIC COLORECTAL SURGERY IN RELATION TO OBESITY

Mark Swinscoe, Amar Joshi, Richard Slater

Rotherham General Hospital, Rotherham, United Kingdom

**Introduction:** Laparoscopic colorectal surgery (LCS) in the obese is technically possible but is reported to be associated with higher conversion rates. Our aim was to assess the outcomes after LCS performed by a single consultant, and assess the effect of obesity.

**Methods:** Between November 2006 and April 2010 data was prospectively entered onto a comprehensive database. Analysis was performed with regard to outcomes and correlated with BMI.

**Results:** There were 125 laparoscopic cases in a 3½ year period. Median BMI was 26.2 (range, 16-47). Overall conversion rate was 13%. Conversion rates for obese (BMI>30), overweight (BMI 25<->29.9) and non-overweight patients (BMI <25) was 23.10%, 16.67% and 6.98% respectively. Median postoperative length of stay (LOS) was longer in converted cases (7 vs 5 days). Median LOS following procedures completed laparoscopically for obese, overweight and non-overweight patients was similar; (3.5 vs 3 vs 4 days for colectomy and 4 vs 6 vs 5.5 days for anterior resection). There was no significant difference in operating time for obese, overweight and non-overweight patients for laparoscopic colectomy (123 vs 140 vs 127 mins) or anterior resection (161 vs 189 vs 166 mins).

**Conclusion:** In our experience, obesity is associated with a higher risk of conversion of laparoscopic colorectal procedures. A converted procedure is associated with increased post operative length of stay. However, BMI does not appear to be a factor which influences length of stay following a non-converted procedure, and obese patients may appear to benefit more from a laparoscopic procedure.

**Key statement:** Laparoscopic colorectal surgery in the obese is associated with a higher conversion rate, but similar length of stay in non-converted cases.
OPEN VS. LAPAROSCOPIC APPENDICECOMY: THE BATTLE IN A DISTRICT GENERAL HOSPITAL

Omar Tawfiq, Mohammed Al-Gailani

Rotherham General Hospital, Rotherham, United Kingdom

Introduction: Although laparoscopic techniques are increasingly utilised in general surgery, laparoscopic appendicectomy is not universally accepted as the standard surgical approach in the treatment of acute appendicitis in some district general hospitals in the UK. We aimed to compare the outcome of laparoscopic and open appendicectomy (performed through right iliac fossa incisions) in our district general hospital.

Methods: A prospective database was compiled over a 12 month period. A comparative analysis was carried out. 103 patients were included in the study, 60 of whom underwent laparoscopic appendicectomy (LA) with 43 undergoing open appendicectomy (OA). The primary outcome was length of stay. Secondary outcomes were conversion rate, complication rate, grade of surgeon and operative time and cost of admission.

Results: The male female ratio was 48%:52%. LA was associated with a shorter median hospital stay (2 vs 4 days, p< 0.05) and a lower incidence of wound infection (6 % vs 14%). There were fewer intra-abdominal collections after LA (1.6% vs 9%). The median operative times were comparable. A consultant performed 57% of the LA and 14% of the OA. The conversion rate was 12%. No significant difference in cost was found.

Conclusion: Laparoscopic appendicectomy is a safe and cost effective operation in district general hospitals. It is associated with a lower incidence of complications and shorter hospital stay. Its routine use should be encouraged given these advantages.

Key statement: Laparoscopic appendicectomy is preferable to open appendicectomy in a district general setting.
LAPAROSCOPIC CHOLECYSTECTOMY AND INGUINAL HERNIA REPAIR: POTENTIAL SAVINGS IN AN AGE OF BUDGET CUTS

Peter Truran, Andrew Gilliam

County Durham and Darlington Foundation Trust, Darlington, Durham, United Kingdom

Introduction: The current economic climate has focused organisations to cut their costs and the NHS is no exception. Laparoscopic cholecystectomy and inguinal hernia repair are common elective procedures in the NHS accounting for 137,000 cases annually in the UK. We investigated the varying costs of consumables involved in both procedures to explore potential savings.

Methods: The list price of consumables and equipment servicing costs were calculated for the different methods of performing a cholecystectomy and inguinal hernia repair. Additional costs including suction devices, specimen retrieval systems, meshes and fixation devices were compared. The cost of Single Incision Laparoscopic Surgery (SILS) was also considered.

Results: The consumables cost of a laparoscopic cholecystectomy ranged from £95.46 to £559.30. The cost of a laparoscopic hernia repair ranged from £126.21 to £654.27. Open hernia repair cost £30.86. SILS approach for cholecystectomy and inguinal hernia repair cost £902.75 and £973.34 respectively. The use of reusable equipment, mesh, specimen retrieval system employed made a considerable difference.

Conclusion: The cost of these two operations vary greatly depending on the equipment chosen. Awareness of these costs will become increasingly important as many surgical departments attempt to cut costs. Operating time is also a factor. This issue is likely to affect many laparoscopic surgeons in the next year.

Key statement: The cost of theatre consumables for the different techniques of performing these operations vary considerably.
How far can we go? Moving towards a complete and safe laparoscopic colorectal service

Peter G Vaughan-Shaw, Katherine L Pearson, Imogen Fecher, Alexander H Mirnezami, Nicholas E Beck, Andrew T King, Paul H Nichols, John S Knight

Southampton University Hospitals NHS Trust, Southampton, United Kingdom

Introduction: The National Institute for Clinical Excellence (NICE) has recommended laparoscopic resection as an alternative to open surgery for patients with colorectal cancer. The Department of Health’s aim is to offer all suitable patients laparoscopic colorectal resections (LCR). This study evaluates the growth of LCR within a busy teaching hospital.

Methods: Data was collected prospectively on all patients undergoing elective laparoscopic colorectal resection over a 7-year period for both benign and malignant pathology.

Results: Between 2004 and 2010, 386 LCR have been performed in our unit. Over this period the conversion rate has decreased from 43% to 8%(p<0.005) while the major complication rate has decreased from 21% to 3%(p<0.05). Case-complexity has increased significantly with 83% of all low and mid-rectal tumours being removed laparoscopically.

Conclusion: With increasing laparoscopic experience we have seen year-on-year increase in number and proportion of LCR with a concurrent decrease in conversion and complication rate. This year-to-date 120 LCR were performed, 78% of all colorectal resections. Complex procedures including ultra-low anterior resection, APER, and ileo-anal pouch are now commonly performed laparoscopically.

Key statement: Laparoscopic surgery is now well established for colorectal resections. We can now demonstrate that the vast majority of elective resections can be performed laparoscopically with a low conversion rate and a low incidence of complications.
POSTER 52

TRAINEES’ EVALUATION OF THE ENGLISH NATIONAL TRAINING PROGRAMME IN LAPAROSCOPIC COLORECTAL SURGERY

Susannah M Wyles¹, Danilo Miskovic¹, George B Hanna¹, Mark G Coleman²

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Introduction: The National Training Programme (NTP) was set up in 2008 to target established colorectal surgeons who desired to learn laparoscopic colorectal surgery. The aim of this survey study was to review the NTP trainees opinion of the training they received.

Methods: An on-line questionnaire was distributed to registered trainees who had completed more than 5 training episodes. Opinion was given using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree). Demographic data including age, sex, training region, year of specialisation were collected.

Results: Fifty-six registered trainees fulfilled the inclusion criteria, and 39 completed the questionnaire (70% response rate). The trainees’ median age was 45 (range 35-62, 33 male, 6 female). They had been specialists for between 1 and 21 years (median 9) and were from all regions of England. Teaching sessions were organised using either an inreach (22%), outreach (25%), or combination (53%) of training. Trainees felt that their trainers seldom canceled sessions (93%), that it was easy to organise (82%) and consent (100%) an appropriate patient, and that their trusts were supportive of training (94%) and were allocated adequate theatre time (94%). Trainees, overall, found their trainers to be excellent at training (4.7 (range 4-5)), used sound educational principles (4.5 (range 3-5)), and facilitated operations without taking over (4.6 (range 4-5)). Trainees received regular feedback (84%).

Conclusion: The majority of trainees were highly satisfied with the training received thus far through the NTP, irrespective of region or structure used.

Key statement: The English national training program for laparoscopic colorectal surgery delivers highly satisfactory training to consultant trainees throughout all regions.
SHOULD “TOUCHY FEELY” FEEDBACK PLAY A ROLE IN TRAINING ADVANCED LAPAROSCOPIC SURGERY?

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Introduction: Ensuring the maximum educational output is achieved by trainees from any training session is a priority for every trainer. Given that laparoscopic surgery is known to be technically challenging and difficult to learn, any potential improvement to training it should be explored. The aim of this study was to determine whether feedback should be a routine part of training advanced laparoscopic surgery.

Methods: Forty-three semi-structured interviews were carried out by two interviewers (29 surgical trainers, 10 senior surgical trainees, and 4 educationalists). Interviews were transcribed and analysed by two raters using N-VIVO software. Item lists were created, and using the Delphi method, item importance was ranked by 11 national training programme laparoscopic trainers using a 7-point Likert scale (1=very unimportant, 4=undecided, 7=very important). Items scoring <4 were removed.

Results: Consensus was reached through two rounds of the Delphi process. Twenty-seven items regarding feedback were extracted from the interviews, eight were removed. The most important points were to: 1. Discuss issues from the last case, 2. Provide positive reinforcement during the case, 3. 4. 5. After the case; discuss the trainee’s technical performance, devise learning points for the next case, and actively encourage the trainee to reflect independently on their performance.

Conclusion: The importance of feedback in training advanced laparoscopic surgery has been determined through expert consensus opinion. This will enable the development of an assessment tool to ensure it occurs during training sessions.

Key statement: An expert consensus using the Delphi method determined that feedback should be a part of training advanced laparoscopic surgery.
Introduction: Even though the importance of haptic feedback (HF) in real life surgery is well established, its role in surgical simulation training remains obscure. This study aims to evaluate the role of haptic feedback in acquiring skills from a simulation training curriculum for Laparoscopic Cholecystectomy in real training time.

Methods: 18 junior trainees, having no simulation experience were allocated into two groups. Nine followed a Laparoscopic Cholecystectomy training curriculum on Simbionix Lap Mentor (Haptic) and nine on Lap Mentor Express (Non-Haptic). Performance in basic (5 and 6), procedural tasks (3 and 4) and full procedure was compared between groups.

Results: No statistically significant difference was found between number of attempts to reach proficiency in all tasks, besides basic task 6 (mean non-haptic=8.56, mean haptic=16.22, p-value=0.026). No statistically important improvement of acquired skills was found besides total time taken to complete full procedure (mean non-haptic=608.83s, mean haptic=553.27s, p-value=0.019).

Conclusion: The effect of HF on simulation training of novices is limited. It does not reduce training time, on the contrary it may prolong it. Skills acquired are not enhanced except time to complete full procedure. This is of debatable importance as there is no effect on safety related metrics.

Key statement: This study aims to establish the optimum environment junior doctors should train in. Training is of vast importance for good clinical practice and it is therefore important for education related studies to be presented in highly esteemed conferences.