

was no significant difference among them. Time limits of these models were about 12–30 months. It seems giving better idea about liver functional state in cirrhosis within the limits. Correlating these models with Child classification, percentage of tally was 60–80%. But the effect of Child was not so good as the ones of B1 and B2. If Choosing 12, 18, 24, 30 and 36 months individually as effective limit, correctness of assessment of B1 and B2 were 68.57%, 67.86%, 88.77%, 75% and 78.26% in their given order and Child's were 51.43%, 46.53%, 50%, 45.83% and 52.17%.

In terms of the effect above, B1 and B2 seemed more strict than A1 and A2.A1 was the loosest of the four. It showed that it was better to use quantified numerical value than to use original numerical value in developing the new models for predicating prognosis of cirrhosis.

In conclusion, the developed models showed the following characters: simple, practical and more effective. The models can be recommended to General/Family Doctors. But an ideal one needs further exploration.

1589 ERCP Prior to Laparoscopic Cholecystectomy

S. Adamsen. *Danish National Registry of Laparoscopic Cholecystectomy, Department of Surgery, Hillerød Hospital, Hillerød, Denmark*

ERCP is currently used in about 10% of patients before or after laparoscopic cholecystectomy; expert endoscopists using it sparingly and only in patients known or very likely to have duct stones, while less experienced endoscopists tend to use ERCP more often.

After the introduction of laparoscopic cholecystectomy in Denmark in January 1991, the Danish National Registry of Laparoscopic Cholecystectomy was established. All laparoscopic operations are reported prospectively to the registry. For each patient, indications for cholecystectomy and preoperative radiologic investigations are stated, as well as per- and postoperative course including subsequent endoscopic investigation or treatment.

An analysis of patients operated upon during the first three years show an increase in the frequency of preoperative ERCP from 15.6% (75/481) in 1991 to 19.0% (366/1922) in 1992 and 20.6% (384/1867) in 1993 ($P < 0.05$). Not all patients operated upon in 1993 have been registered yet.

The proportion of operated patients with previous bile duct stones has increased from 3.3% to 9.5% ($P < 0.001$), while the frequency of previous gall stone pancreatitis has not changed significantly (3.7% in 1991, 6.2% in 1993, $P = 0.06$). The frequency of preoperative bile duct stones and/or gall stone pancreatitis among the patients who had ERCP increased from 44.7% to 78.2% ($P < 0.001$).

Among all patients with previous bile duct stones, therapeutic ERCP with clearance (by means of EST and/or extraction) had been performed in slightly over 50% in 1992–1993, the remainder having a diagnostic procedure only or no ERCP at all. When ERCP was performed, 66% (1992) and 60% (1993) were therapeutic.

The increased use of ERCP may reflect broadening indications for laparoscopic cholecystectomy with selection of more patients with previous bile duct stones than initially. The increasing proportion of previous bile duct stones in ERCP-patients may be due to stricter indications, even though only 60–66% of the procedures are therapeutic. Details on indications, outcome and complications of ERCP are to be included in the registry.

1590 Is Laparoscopic Cholecystectomy in Cirrhotic Liver, an Easy Job?

Mohsen El-Barbary, Mohamed Abdel Wahab, Omar Fathy, Gamal El-Ebeidy, Farouk Ezzat. *Gastro-enterology Surgery Centre, Mansoura University, Egypt*

Along the period from October 1992 to October 1993, 90 patients of gall stones with cirrhotic liver, were considered for laparoscopic cholecystectomy. All patients underwent ultrasonic abdominal examination, complete laboratory, chest and cardiac assessment. E.R.C.P., papillotomy and stone extraction was done in cases with history (or) of jaundice before the procedure. Cardiac and hypertensive patients were excluded from the study. All patients have had within normal liver and kidney functions. Laparoscopic cholecystectomy was successful in 74 out of the 90 cases (82.2%). 16 cases failed to be completed laparoscopically (17.8%). 6 cases due to uncontrollable bleeding, 3 from injured cystic artery and 3 from bleeding hepatic gall bladder bed. The other failures were due to marked dense adhesions with acutely inflamed gall bladder in 6 cases, injury of common bile duct in 2 cases, injury of gall bladder with escape of multiple small stones intrabdominally in 2 cases, and presence of cholecystoduodenal fistula in one case. There were no deaths, but post operative major complications occurred in 2 cases one due to biliary peritonitis and one due to internal haemorrhage, and exploration was needed to control both cases. The shortest time of the procedure was one hour and the longest was 3 hours. The median post operative stay was 2 days and all patients could start oral diet in the morning of the second post operative day. In conclusion, from our experience and results we suggest that, with good experience and patience, cholecystectomy in cirrhotic livers is easier to be done laparoscopically rather than open surgery.

1591 Laparoscopic Therapy of Non Parasitic Liver Cysts with Omentum Transposition Flap

A. Emmermann, M. Peiper, C. Zornig. *Dep. of General Surgery, University Hospital of Hamburg*

Non parasitic liver cysts and cystic liver disease are considered to be a rare clinical entity. Surgical therapy is only necessary in case of clinical symptoms or complications, i.e. abdominal pain, bleeding, rupture, cholestasis or portal hypertension. This occurs in 5% of all cases. The treatment of choice is partial excision of the external part of the cyst and, if possible, performing a transposition of the greater omentum into the cystic cavity. This results in a low rate of recurrences combined with maximal sparing of normal liver tissue.

The development of laparoscopic surgical techniques in the last years had proven a large benefit for patients treated with minimally invasive surgery concerning postoperative pain and convalescence.

The aim is to use this advantage of reduced abdominal trauma in the treatment of patients with non parasitic liver cysts.

We would like to present ten cases of liver cysts including one with polycystic liver disease treated by partial resection and transposition of the greater omentum laparoscopically. The operative management is described; the results and complications are critically discussed.

1592 Pathophysiological Aspects of the CO₂-Pneumoperitoneum (PP) in Laparoscopic Surgery

J.H. Gebhardt, D. Loose¹, F. Fändrich, M. Ross, H. Schaub. *Dept. of Gen. Surgery, Univ. Kiel; ¹ Dept. of Anaesthesia, Univ. Kiel*

Due to further experiences more older patients with cardio-vascular risk factors will be treated by laparoscopic surgery. In order to assess the anaesthesiological feasibility of this new operative method we investigated the hemodynamic effects following instillation of a CO₂-PP at an intraabdominal pressure (IAP) of 15- or 30 mmHg. *Methods:* Laparoscopy was carried out in eight sheeps. Anaesthesia was achieved with Halothan 1% + nitrous oxide 67%. Ventilation was performed with a ventilatory volume of 700 ml and a frequency of 12/min. Stroke index (SI, ml/min.), cardiac output (CO, L/min.), transmural right atrial pressure (TAP, mmHg), peripher arterial resistance (PAR, kPamin/1) and peripher venous pressure (PVP, mmHg) were monitored.

Results:

t (min.)	SI	CO	TAP	PAR	PVP
<i>IAP 15 mmHg</i>					
0	53	3.5	11	3.1	9
10	44	2.6	7.5	4.5	16
90	54	3.6	10	2.8	17
<i>IAP 30 mmHg</i>					
10	48	3.7	9	3.95	31
90	47	4.0	10	2.96	31

Discussion: Under PP the preload decreases, the afterload increases, CO initially drops up to 40%. PVP increases, indicating a venous stasis in the periphery. During PP the organism seems to adapt. TAP, PAR and CO normalize. After desufflation PVP drops to normal, TAP and CO increases above normal. The blood volume seems to shift back from the periphery. These results demonstrate that PP causes a significant and changing cardiac load. Especially the initial drop of CO might be critical in patients resembling cardiac risk factors. PP should only be performed with substantial monitoring in the elder patient.

1593 Value of Urgent Laparoscopy in Patients with Acute Abdominal Syndrome

S. Glinkov. *Medical University, Varna, Bulgaria*

With the advent of laparoscopic surgery there is an increased interest and return to laparoscopy (L) as a diagnostic procedure.

For a 5 year period 354 pts with acute abdominal syndrome were examined via L. The mean age of the pts was 59.8. Males were 237 (66.31%) and females – 117 (33.69%). L was performed during the first 12 hours of the admission in 45.52% of the pts and in 81.24% – by the 24th hour. L diagnosis was confirmed by surgery, follow-up, CT, histology and autopsy. It was accurate in 347 pts (98%). Out of these, 107 pts (30.22%) avoided abdominal surgery, 164 (46.33%) were operated on emergency after L and 22 (6.22%) underwent planned operation.

At L the following findings were observed: acute cholecystitis-29 (8.22%), acute pancreatitis-24 (6.77%), perforated gastro-duodenal ulcer-19 (5.38%), mesenteric thrombosis-27 (7.65%), ileus-12 (3.41%), complications of colorectal cancer-21 (6.95%), complications of gastric cancer-12 (3.41%), acute appendicitis-8 (2.26%), diseases of the liver-37 (10.48%), obstructive jaundice-18 (5.10%), blunt abdominal trauma-43 (12.18%), gynaecological diseases-10 (2.6%), postoperative L-6 (1.73%), abdominal aortic aneurism-5

(1.46%). In 83 pts (23.45%) no abnormalities were found at L.

In 28.8% of the pts the initial diagnosis was confirmed by L, in 23.16% it was completed and specified and in 48.02%-completely changed.

There were 6 complications (1.7%) due to L – all at the beginning of our experience. No mortality was observed. In 3 cases L failed because of thick abdominal wall.

Conclusion: In the hands of an experienced endoscopist L is an important and useful procedure that may indicate or prevent operation in pts with acute abdominal syndrome.

1594 Changing Trends in Gallbladder Surgery

A. Gradauskas, A. Bubnys, G. Simutis. *Clinic of Abdominal Surgery, Vilnius University, Lithuania*

The first laparoscopic cholecystectomy (LC) in our clinic was performed on December 29, 1992 (it was the first LC in Lithuania too). The aim of our work was to reveal today situation in surgical treatment of gallbladder pathology.

In one year 406 cholecystectomies were done in our clinic: 266 LC (65.5%), (using "EFFNER" equipment) and 140 (34.5%) traditional ("open") operations. After LC the main mass of our patients - 243 (91.4%) - didn't need narcotic analgetics for postoperative pain relief, no intravenous fluid infusions were needed, patients began walk and drink the same or next day, they left hospital in 2-7 days (mean range - 4.7 days) postoperatively. In 12 cases we had to reverse LC to open procedure. One patient (0.37%) died, in 8 cases (3.0%) the postoperative complications took place.

We had to perform 140 "open" cholecystectomies because 8 (5.7%) patients refused from LC, 8 (5.7%) were operated earlier and adhesions in abdominal cavity were suspected, 12 (8.6%) had herniating in upper part of abdominal wall, in 16 (11.4%) cases cholecystectomy with bile ducts exploration was necessary, for 28 (20%) - simultaneous operations were done. 30 (21.4%) patients were operated on with peritonitis, for 4 (2.9%) persons with cardiac failure pneumoperitoneum was considered as contraindication, in 4 (2.9%) cases other diseases of abdominal cavity were suspected and revision was necessary, for 30 (21.4%) patients "open" operation was performed because of other reasons. All these patients needed narcotics and intravenous infusions in postoperative period and were discharged in 7-22 days (mean range - 11.4 days).

LC becomes the main operation in the treatment of "pure" gallbladder pathology because of comfort for patient and economical effect. Only in certain cases traditional cholecystectomy still should be performed.

1595 Laparoscopic Ultrasonography – A Method of Choice by Diagnostical Problems of the Visual Methods

N. Grigorov, N. Krastev. *Clinical Centre of Gastroenterology, University Hospital "Queen Joanna", Sofia, Bulgaria*

85 cases of liver (45), biliary (6), pancreatic (15), stomach (2) diseases and 4 abdominal haemorrhages (due rupture) are discussed. The indications for carrying out the method of laparoscopic ultrasonography (US) include: insufficiency of the visual methods (ultrasound, CT, scintigraphy, angiography) and/or diversity of their opinions with regard to the final diagnosis; ineffectiveness of laparoscopy; discrepancy between the information received by visual and endoscopic methods and the concept of the clinicians, regarding the diagnosis. The laparoscopic US is in fact a continuation of the endoscopic examination in depth. It requires polypositional scanning with high frequency transducers (linear 7.5 MHz probe is used); high professional training of the examiner in laparoscopy and intraoperative US. Diagnoses are corrected (55), confirmed (17) or rejected (13) in cases, like: differential diagnosis of benign and malignant processes in the liver and pancreas; liver tumors and cysts; cystadenomas and cystadenocarcinomas; evidence of small liver lesions (under 5 mm) and primary biliary malignancy; cholangitis sclerosans and etc. The staging of the tumors is fixed by their dimension and surrounding infiltration. In 8 cases ultrasound guided functions are applied with suitable needles for cytological, histological and electron-microscopical analysis.

1596 Results of Laparoscopic Rosetti Fundoplikation

Bengt Hallerbäck, Hans Glise, Bo Johansson. *Department of Surgery, NÄL, 461 85 Trollhättan, Sweden*

Fundoplication for reflux disease is a new and interesting application for laparoscopic surgery. The 360° floppy fundoplication is performed thru five to six cannulas. The distal esophagus is dissected free and a posterior raphi of the hiatus performed. The gastric vessels are left intact. During operation a 36 CH gastric tube is used. After operation the patients take oral fluid the first postoperative day.

Between may '92 and sept 93 we have performed 55 consecutive cases. Operating time ranges from 80 to 240 minutes. Mean postoperative hospital

stay is 2.6 days. Conversion to open surgery was done in 6 cases. Complications were very few, the only major one was a postoperative thrombosis and pneumonia in one patient converted to open surgery. Other complications were minor such as irritation and superficial infection in cannula incisions.

Symptomatic follow up has so far been performed in 41 patients with a follow up time of 3-8 months. Regurgitation and heartburn have disappeared in all patients but relapsed in one. Mild substernal pain was still noticed in 13 patients, 15 had mild belching difficulties and 23 disturbing flatulence. Pre and postoperative manometry and 24 hrs pH monitoring have hitherto been performed in 19 patients (at least 6 months postoperative). Mean LES pressure enhanced from 5-14 cm H₂O. Mean 24 h pH was lowered from 14 % to 1 %. The follow up results do not differ from results achieved in patients operated with conventional open Nissen (n = 42) or Rosetti (n = 36) technique.

The Rosetti fundoplication can be performed safely, with a short hospital stay and primary postoperative results at least as good as with conventional open surgery.

1597 Laparoscopic Resection of Sigmoid Cancer in Slovakia – Report of the First Case

P. Holečzy, M. Brix. *Surgical, Internal Department Railway Hospital, Bratislava, Slovakia*

After introduction of laparoscopic cholecystectomy, appendectomy and hernia repair we made another step in laparoscopic surgery as a pioneers in our country.

In a 47 year old male with history of hematochesia the colonoscopy examination revealed an adenocarcinoma gr.II.WHO. Ultrasound of the liver was negative for metastasis, the level of CEA was mild elevated.

25 degree laparoscope was used, access through five trokars. The ligation of the vessels as the first step was done, then the colon was cut using ENDOGIA. Mobilisation and resection of the mesocolon was performed. The specimen through five cm incision in the scar after previous hernia repair was removed. The anastomosis, hand sewn, was created and the wound was closed. Reconstruction of mesocolon was completed laparoscopically.

In the follow up the chemotherapy according our schema was administered. Seven month after resection is patient well, disease free.

In spite of only the first case we believe, that laparoscopic resection could be treatment of choice also in the colon cancer.

1598 Evaluation of Laparoscopic Ultrasound for Tumor Staging

M. Hünerbein, B.S. Rau, P.M. Schlag. *University Hospital Rudolf Virchow, Berlin, Germany; Robert-Rössle-Hospital, Berlin, Germany; Tumor Institute, Berlin, Germany*

Accurate staging of malignant disease is one of the major goals of preoperative patient investigation in surgical oncology. Laparoscopic ultrasound attracts by high resolution ultrasound examination of intraabdominal organs with a minimum of risk and inconvenience for the patient. In this study a flexible echoendoscope was evaluated for laparoscopic ultrasound. **Methods:** 20 patients received laparoscopy for suspected intraabdominal malignant disease. For laparoscopic ultrasound a flexible echoendoscope (Pentax, 7.5 MHz curved array) was introduced into the abdomen via a 15 mm trocar. The liver as well as abdominal lymph nodes were examined by contact ultrasonography. Biopsies of suspicious lesions were taken for histologic analysis. The results were compared with standard staging procedures (CT, US). **Results:** In 4 of 20 patients laparoscopic ultrasound revealed additional liver lesions not detected in preoperative imaging studies (2 benign, 2 malignant). The diameter of the lesions was ranging from 0.5 to 1.5 cm. In one patient with carcinoma of the cardia laparoscopic ultrasound indicated infiltration of the left lobe of the liver. Suspicious lymph nodes were localized by laparoscopic ultrasound in 6 of the 20 patients (30%). Four of these were exclusively detected by endosonography. After diagnosis of advanced malignancy 5 patients (25%) with esophageal cancer received definitive palliative treatment (PEG) laparoscopically. No major complications were observed related to laparoscopy. The mean postoperative hospital stay of patients without further surgery was 5 days. In summary by laparoscopic ultrasound additional informations with respect to staging, diagnosis and resectability of malignancy were obtained in 12 of 20 patients (60%). Consequently the therapeutic strategy was changed in 7 patients, while in 5 patients the initial concept was confirmed. **Conclusions:** Laparoscopic ultrasound proved to be a sensitive method for the detection of small liver lesions and intraabdominal lymph node metastases. Due to the lack of tactile sensitivity it is a valuable tool for guidance of laparoscopic surgery. The flexible instrument used warranted access to all regions of the abdominal cavity and can improve staging of intraabdominal malignancy in the future thus reducing unnecessary surgery and hospitalisation in incurable patients.

1599 The Importance of the Real-Time Fluoroscopic Intraoperative Direct Cholangiogram in the Laparoscopic Cholecystectomy Using a New Instrument

T. Ichihara, N. Suzuki, M. Horisawa, J. Sakamoto¹, M. Kataoka, Y. Uchida, M. Sekiya, T. Matsui, K. Chen, H. Miyagawa, A. Koide. *Department of Surgery, Nagoya National Hospital; ¹ Department of Gastroenterological Surgery, Aichi Cancer Center, Nagoya, Japan*

Laparoscopic cholecystectomy (LC) has become an accepted standard operation for gallstone in the world. On the other hand, complications accompanied by bile duct injuries were recently reported with expansion of the indication of LC. Intraoperative cholangiogram is essential for safe LC to minimize the risk of bile duct injury. The disadvantages of intraoperative cholangiogram include increased operating time and the possibility of bile duct injury by its use, because of the difficulty of maneuver.

We have achieved a method for real-time fluoroscopic cholangiogram by using a new instrument which was made by us. It is a kind of sheath by which firstly a round-tip stylet is inserted to coax gently through the spiral valves of the cystic duct. Secondly, this stylet is removed and the cholangiogram catheter is smoothly inserted. Digital C-arm fluoroscopy provides "real-time" imaging of the biliary tree. As a result, we can now get a clear cholangiogram easily in a short time. In the first 86 patients, direct cholangiogram were attempted in 59 cases and were successfully completed in 55 cases (93.2%).

Now, we are able to cope with bile duct injuries and anomalies, and unsuspected bile duct stone, owing to our method of real-time fluoroscopic intraoperative direct cholangiogram.

1600 Complications in Laparoscopic Cholecystectomy-Experience from 300 Procedures

B. Johansson, B. Hallerback, H. Glise. *Dept of Surgery, Norra Älvsborgs Länsjukhus, Trollhättan, Sweden*

Complication analysis is of great importance in assessing new surgical techniques. Since the start of laparoscopic cholecystectomy at our department 1991 all procedures and complications have been registered by the surgeons and an independent nurse. The results of 300 cases until May 1993 are presented with emphasis on the complications.

Methods: All patients had symptomatic gallstone disease. Preoperative ERCP was done if history of jaundice, dark urine, pancreatitis or pathologic liver function tests. Common bile duct stones (CBDS) were if possible treated endoscopically. Intraoperative cholangiography (IOC) was performed selectively. All patient records and the complication register were thoroughly searched for complications.

Results: Primary open cholecystectomy was done in 23 cases, most of them in the beginning of the laparoscopic era. Of 277 laparoscopy cases 18 (6%) were converted to open surgery. Preoperative ERCP was performed in 76 patients (25%). CBDS was found in 17 of these (22%). IOC was done in 35 of the laparoscopic procedures (13%) and in 13 of laparotomy cases (57%). Complications were noted in 36 cases (12%). 18 of these were infectious complications, mainly wound infections. Bile duct complications were found in 9 cases (3%). Of these, 4 had residual CBDS (2 open procedures), 4 had bile leakage (2 open procedures) and 1 had jaundice (open procedure). There was no case of bile duct injury. Additional 9 cases had miscellaneous complications, e.g. thrombosis, postoperative bleeding, duodenal perforation and ulnar palsy.

Discussion: Most of the infectious complications were a superficial infection of the umbilical wound. Some of these can probably be prevented by meticulous preoperative disinfection and by extracting the gallbladder through another wound. Preoperative ERCP was done in one fourth of the patients, CBDS were found in 22%. The indications for ERCP should probably be more restrictive. The analysis of bile duct complications is of great importance, especially as IOC was performed on a selective basis. In 4 of the 9 cases IOC was performed. In a retrospective analysis we conclude that routinely performed IOC would possibly in one case have lead to peroperative diagnosis of a small CBDS which got stuck in the papilla and caused a blow-out syndrome with bile leakage. In the other cases routinely performed IOC would probably not have changed the course.

1601 Laparoscopic Ultrasonography. An Adjunct to the Staging of Gastric Cancer?

M.B. Mortensen, M.R. Madsen, C.P. Hovendal. *Department of Surgical Gastroenterology, Odense University Hospital, Denmark*

Introduction: The disappointing results of conventional ultrasonography and dynamic CT in the pretherapeutic staging of gastric cancers has accelerated the introduction of endoscopic ultrasonography (EUS). Despite the high accuracy of EUS in locoregional staging of these tumors a group of patients

still have to face the problems of a futile laparotomy because of inconclusive pretherapeutic imaging techniques. The use of laparoscopy in these cases has not solved the problem because of its inability to look beneath the surface of intraabdominal structures. Theoretically, laparoscopic ultrasonography (LUS) possesses this potential, but so far this technique has been reported on a sporadic experimental basis only. We report our experience with a commercially available LUS system, as an adjunct to laparoscopy, in the staging of a gastric cancer patient where preoperative imaging techniques were inconclusive.

Instruments: LUS was performed using a newly developed LUS-system (Brüel & Kjør, Denmark) consisting of a convex array transducer mounted on a flexible tip of a long rigid probe (40 cm) and connected to a scanner unit with B-mode as well as colour doppler facilities. The probe was sterilized, introduced through a standard port and manoeuvred according to the laparoscopic and ultrasonographic image. Working frequency varied between 5.0 and 7.5 MHz.

Results: A complete image of the tumor was obtained merely by slow movements of the head of the transducer upon the anterior part of the stomach. The luminal and intramural extent of the tumor was clearly outlined as an irregular hypoechoic mass distinguishable from the appearance of the normal stomach wall. As infiltration into the retroperitoneal space had been suspected during preoperative EUS, a small incision of the gastrocolic ligament was made. The probe was inserted through this incision and tumor infiltration of the retroperitoneal space was demonstrated by LUS.

Lymph nodes less than five millimeters in diameter could be identified and the important area around the coeliac trunk was visualized without any dissection. LUS of the liver showed no signs of liver metastases and no infiltration of the left gastric artery was demonstrated. Palliative gastrectomy was decided and intraoperative findings corresponded to the LUS findings in every aspect.

Conclusion: The newly developed convex array LUS system provides important and detailed information for locoregional assessment of gastric cancer. It seems that LUS could be an important adjunct to laparoscopy in patients where pretherapeutic imaging techniques and standard laparoscopy are inconclusive.

1602 Doppler Ultrasonography in Laparoscopic Cholecystectomy

R. Mårvik, A. Wibe, A. Kleven¹, B. Angelsen¹, B. Ystgaard, H.E. Myrvold. *Department of Surgery, Trondheim University Hospital, Trondheim, Norway; ¹ Biomedical Institute, Trondheim University Hospital, Trondheim, Norway*

The introduction of laparoscopic surgery for treatment of gall bladder disease has changed the panorama of intraoperative problems. One of the main difficulties is inadvertent severance of vessels in Calot's triangle. The subsequent haemorrhage and loss of visibility can force a conversion to open surgery. Doppler ultrasonography might reduce this problem and has thus been employed in a series of patients.

A 10 mHz doppler probe with a diameter of 5 mm has since October 1993 been used in 23 patients undergoing laparoscopic cholecystectomy in order to map the anatomy of the vessels in the area.

In all patients arteria cystica could be traced down to arteria hepatica dexter or hepatica communis, and vena porta was also identified. In 3 patients two arteries to the gall bladder were found, while 4 others had anomalies of site of the arteries. These findings were subsequently confirmed visually after dissection. In 8 patients the Doppler examination were found to be of value by the surgeon in terms of quicker and safer dissection.

The Doppler examination can give additional information of value in laparoscopic cholecystectomy and thus increase the safety of the procedure, particularly when inflammatory changes are present.

1603 Minimally Invasive Procedure in Patients with Complicated Gallstone Disease

A. Bubnys, G. Simutis, A. Gradauskas. *Clinic of Abdominal Surgery, Vilnius University, Lithuania*

Laparoscopic cholecystectomy (LC) has essentially replaced open cholecystectomy (OC) as the procedure of choice for cholecystolithiasis, however, choledocholithiasis cannot usually be managed with a laparoscopic approach in Lithuania till now due to the lack of necessary equipment. Therefore combined endoscopic sphincterotomy (ES) and LC is a potential solution to this problem. The purpose of the study is to determine the feasibility of this combined procedure in patients with complicated gallstone disease during a 11-month period. A standard set of laparoscopic instruments of the firm "EFFNER" (Germany) was used.

A group of 25 patients who had both endoscopic retrograde cholangiography (ERC) and LC was analyzed. This group was compared with a control group of 35 patients undergoing OC combined with ERC in the year before LC was introduced. ERC has to be performed when choledocholithiasis predictors are present. 19 patients had common bile duct stones. These were

successfully removed after ES. As for the remaining 6 patients: four were found to have a bile duct stricture and another two – gallstone pancreatitis. No serious complications as a result of ERC or ES were encountered. We didn't carry out ERC due to the retained stones after LC over the studying period. Proposed decision tree for the evaluation and treatment of choledocholithiasis in a patient having LC is presented.

Both groups were comparable concerning age, weight and co-morbidity. The mean length of hospital stay was 17 days for LC group vs. 24 days in OC group ($p < 0.05$). Other significant differences include morbidity (4% vs. 8%, $p < 0.05$), mean postoperative length of stay (8 vs. 13 days; $p < 0.05$). All OC group patients required postoperative intramuscular opiates and intravenous fluids, while 16% of LC group did not require any analgesia at all.

This study concludes that combined ES and LC in patients with complicated gallstone disease led to less complications, shorter hospital length of stay, and minimal use of postoperative analgesia. The combination therapy of ES and LC will be recommended for this kind of patients as a minimally invasive procedure.

1604 An Experimental Study on Diathermy Effects on the Bile Ducts

E. Trondsen, A.R. Rosseland, A. Bakka, T.E. Ruud, T. Martinsen, A. Bergan, A.O. Aasen. *Institute for Surgical Research, University of Oslo, Oslo, Norway*

Use of diathermy may be a possible cause of strictures on the common hepatic duct reported after laparoscopic cholecystectomy. In order to further elucidate this problem, we have used a *Material and methods*: Monopolar diathermy in anesthetized pigs. The diathermy was applied at standardised locations along the cystic duct, in the angle between the cystic duct and the hepatic duct, directly on the bile ducts before and after evacuating bile, and near a clip on the cystic duct. Three to twelve repeated applications of five seconds duration were given at each location. The temperature was measured at standardised locations on the anterior wall of the bile ducts immediately after each application with a T-thermo-element giving the correct temperature within one second. A pilot series of seven pig and a standardised series of six pigs were used.

Results: Diathermy along the cystic duct did not increase the temperature above 5 degrees centigrades, and the mean temperature did not exceed 1.7 degrees in any application series. Diathermy directly on the bile ducts only induced increased temperature at the proximal part of the hepatic duct after application at its distal part (maximum 18 degrees, mean values < 4.5 degrees). Evacuation of bile did not influence temperature change. Diathermy applied directly into the common bile duct induced one event of 11 degrees temperature elevation, otherwise not above 4 degrees. Diathermy applied 0.5 cm away from the clip, induced increase of the temperature up to 11 degrees.

Conclusion: Diathermy applied directly to the bile ducts may induce unexpected distant increases in the temperature of the duct walls. Application near a clip may increase temperature in the clip. Diathermy applied along the cystic duct revealed no significant increase in the temperature.

1605 Psychiatric Assessment of Patients with Gastrointestinal Distress. Concordance with Psychiatrist's Recommendation

E. Ekblad, M. Vatn, S. Blomhoff, U.F. Malt. *Department of Psychosomatic and Behavioural Medicine, The National Hospital, University of Oslo, Norway; Department of Medicine A, The National Hospital, University of Oslo, Norway*

Clinical problem: Patients with gastrointestinal distress that cannot be explained by somatic investigations, are often referred for psychiatric assessments. Despite this very few studies have addressed to which extent the recommendations given by the psychiatrists are taken into consideration by the treating gastroenterologist.

Material and method: During 1993, all patients with gastrointestinal distress referred to the Department of Psychosomatic Medicine were identified. We compared the recommendation for treatment given by the psychiatrist with the actual treatment recommended by the gastroenterologist.

Results: Preliminary analyses suggest that there is a striking discrepancy between the recommendations given by the psychiatrists and those given by the gastroenterologists following the psychiatric consultation.

Conclusion: The lack of concordance with the recommendations reduces the benefits of psychiatric assessments. The reasons are more related to physicians than patients.

1606 Evaluation of Electroencephalographic Data in Irritable Bowel Syndrome

A. Irnius, D. Astrauskiene. *Vilnius University, Santariskes Hospital, Santariskiu 2 2600 Vilnius, Lithuania*

There are a lot of unresolved problems concerning diagnostic and treatment

of bowels diseases. One of them – relation between irritable bowel syndrome and central nervous system.

The purpose of our investigation was evaluation of functional status of brain in irritable bowel syndrome (IBS) applying electroencephalographic (EEG) data.

We studied 42 patients (6 men and 36 women) with IBS. The diagnosis was made from clinical, endoscopic and histological features. There was no evidence of malignancy and inflammatory processes. Patients mentioned above underwent EEG with functional tests (photostimulation, hyperventilation).

Normal EEG was found in 7 (16.2%) patients, in 35 (83.8%) cases – different functional disorders of brain (desin-chronisation and irritable cortex, abnormalities of neurodynamic function).

Thus, our results indicate that the majority of patients with IBS has functional disorders of brain.

In conclusion, the treatment of patients with irritable bowel syndrome must be adequate, and functional state of brain should be taken into consideration.

1607 Increased Patients' Anxiety Levels Before Endoscopic Procedures

G. Mastropaolo, M.G. Lucà, F. Galeazzi, L. Nalin, R. Naccarato. *Dpt. of Gastroenterology, University of Padova, Italy*

Endoscopic procedures are regarded as extremely invasive diagnostic means and it has been reported that subjects undergoing upper gastrointestinal endoscopy develop high anxiety levels. We evaluated whether colonoscopy has a similar stressful effect.

The anxiety status of 364 outpatients undergoing colonoscopy (COL) (134 subjects, 20–80 yrs, 78 males), gastroscopy (G) (137, 15–81 yrs, 70 males) or simple consultation (C) (91, 23–85 yrs, 51 males) was assessed by means of two self-administered questionnaires (Spielberg 1970) which assign independent scores (min 20 – max 80) to anxiety levels due both to patient personality (Trait) and to transient emotional states (State).

Results. Trait Anxiety was similar in the three groups (COL: 41.3 ± 9.2 ; G: 42.6 ± 9.4 ; C: 43.5 ± 9.7) ($M \pm SD$), being always higher in women than in men mean ($p < 0.001$, Student's t test). In women, State Anxiety levels before colonoscopy (49.4 ± 12.2) and gastroscopy (49.8 ± 10.8) were higher than before consultation (45.6 ± 10.3), but in men, a similar significantly milder psychological response was observed in the three situations (COL: 43.4 ± 11.2 ; G: 42.5 ± 9.8 ; C: 43.9 ± 8.8) ($p < 0.02$). No correlation was found between anxiety levels and age. Patients had the same anxiety levels at their first (60) or control gastroscopy, but lower state anxiety was observed at follow-up colonoscopies.

Conclusions. Patients undergoing endoscopic procedures, both gastroscopy and colonoscopy, develop a status of anxiety, particularly high in women. The memory of gastroscopy seems more unpleasant than that of colonoscopy. Adequate patient instruction and psychological assistance could be helpful in preparing patients for endoscopy.

1608 Psychoemotional Deviations and Dyspepsia

M. Mumma. *Estonian Institute of Experimental and Clinical Medicine, Tallinn, Estonia*

In the present research we have studied rural residents by a specially compiled questionnaire to detect gastrointestinal complaints. At the same time special attention has been paid to the following aspects: sleeping disorders, headache, general anxiety, longterm stress-situations in the past, contentment with family life, received treatment for neurosis in the past.

We have questioned 1316 rural residents; 500 of them had dyspeptic complaints. All these patients were investigated by endoscopy, ultrasonography e.t.c.

Analysing the results, appears, that the group of patients with dyspeptic complaints had more frequently psychoemotional deviations.

42.1% of dyspeptic persons (DP) and 26.9% non-dyspeptic persons (NDP) had long-term stress-situations in the past; 37.9% of DP and 22.0% of NDP had sleeping disorders; 60.9% of DP and 37.7% of NDP had headache; 32.5% of DP and 14.3% of NDP had general anxiety – the differences were significant ($p < 0.01$).

There were no significant differences in contentment with family life and in previous treatment for neurosis.

It is evident, that gastroenterologists should pay more attention to psychoemotional deviations in rural residents with dyspeptic complaints, consulting the psychotherapist if necessary.