The aim of the study is the examination of the relative portal blood flow, by assessment of the hepatic perfusion index (HPI) in different degrees of hepatic cirrhosis related to liver cirrhosis and some focal liver lesions. Hepatic radionuclide angiography (HRA) was performed with bolus injection of 740 MBq 99m-Tc-pertechnetate, during one minute (1 frame), using ROTA scintillation camera and Micro Delta computer (Siemens). HPI was estimated using Sarper’s method of slope analysis.

In 10 controls, HPI was 0.68 ± 0.06; it was significantly decreased (p < 0.01) in 5 patients with chronic active hepatitis (HAI, 0.57 ± 0.03), with liver cirrhosis without (LC, X = 0.49 ± 0.13) and 18 with esophageal varices (LCVE, X = 0.32 ± 0.19), as well as in 4 patients with LC and sclerosated esophageal varices (LCSEV, X = 0.16 ± 0.11). Comparing to HAI and LC (HAI-LC, p > 0.05), HPI values were significantly lower in LCVE (p < 0.01) and LCSEV (p < 0.05), while the values between the last two groups didn’t differ (p > 0.05).

In 22 patients with liver hemangiomas (LH, X = 0.64 ± 0.08) HPI values were physiological (C-LH, p > 0.05). However, in 4 patients with hepatocellular carcinoma (HCC) (LC, X = 0.26 ± 0.20), and 8 with liver metastases (LM, X = 0.40 ± 0.28), HPI values were significantly decreased (p < 0.01), but they didn’t differ between themselves (H-LM, p = 0.05).

Portal liver perfusion decreases in respect to the portal hypertension and collateral circulation development. Thus, significant difference is proved between HPI values in cirrhotic patients with and without esophageal varices, while after sclerotherapy, HPI remains very low. Considering that in patients with hemangiomas, HPI values are normal, which is not the case in those with primary carcinomas and metastases, HRA is a useful method for the differential diagnosis of hemangiomas and primary liver carcinomas, together with ultrasonography and blood pool scintigraphy.

**Endoscopic Aspects in Portal Hypertensive Gastroscopy**

Chr. Banciu, Tr. Banciu, D. Tuculesu, S. Cotul, Lelia Şuşan, Elena Potenz. IVth Dept. of Internal Medicine, University of Medicine and Pharmacy Timisoara, Romania

The object of the study is an assessment of the endoscopic aspects of the gastric mucosa in patients with portal hypertension (PHT) and hepatic cirrhosis (HC), together with an estimation of the underlying histological changes leading to these modifications, and also a comparison with the ultrasonographic, laparoscopic and splenorenalportographic modifications.

**Material and Methods:** The study was carried out on 60 patients with PHT and HC in different evolutive stages. Eso-gastro-duodenoscopy was performed in all patients, and the modifications of the gastric mucosa were determined. In some patients antral and fundic biopsies were taken. The endoscopic aspects were correlated with the Child-Pugh stages of HC and compared with the ultrasonographic, laparoscopic and splenorenalportographic signs of PHT.

**Results:** Four types of endoscopic gastric mucosa modifications were noted: (1) A scarring rash and superficial erythema in 10 cases (16.6%), with no significant histological changes. An inflammatory infiltration of the gastric mucosa was seen in six cases with alcoholic cirrhoses. (2) The mosaic pattern (snake skin), in 15 cases (25%), seen as a fine reticular pattern separating areas of atrophic atrophic endematous and normal mucosa, localized mostly in the antrum, but also in the fundic area of the stomach, and even on the duode num; histologically, there were no significant changes, but electron microscopic findings revealed eccustic submucosal capillaries. (3) Cherry red spots and diffuse hemorrhagic gastritis in 12 cases (20%). Five of these patients had upper gastrointestinal bleedings. Histology revealed submucosal venous and capillary dilatation and submucosal inflammatory changes in eight cases. (4) Gastric cardial varices (stages I–3) in 14 cases (23.3%), often associated with esophageal ones. Three of the patients were bleeding from these varices. None of the patients (15%) had normal gastric mucosa, without any modifications.

The ultrasonography, laparoscopy and isotopic splenorenalportography (with 119 In, and the determination of the spleno-porto-cardiac circulation time) confirmed the presence of elements of PHT in all patients with erythema and varices at the gastric level. A good correlation with the evolutive stages of HC has been noted.

**Conclusions:** The presence of a congestive gastroopathy in patients with PHT and HC has been demonstrated. The gastric inflammatory infiltrate was present in 28% of the cases, in correlation with the alcoholic etiology of HC.

**Doppler Ultrasoundography (US) Examination of Portal Circulation After Transjugular Intrahepatic Portosystemic Shunt (TIPS)**

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TIPS is a radiological method for treating upper gastrointestinal bleeding in cirrhotic patients. TIPS has been shown to decrease the portosystemic gradient by about 40%. Little is known of the effects of TIPS on portal hemodynamics. We examined 15 patients (9 M, 6 F, age range 53–72 yrs) who underwent TIPS for variceal bleeding (13 pts) or intractable ascites (2 pts). A doppler US was performed before and after 48 hrs, 7 days, 1, 3 and 6 months after TIPS. The following parameters were measured: maximum (VMax) and average (Vmean) velocity of blood flow (cm/sec) in the portal (PV), splenic (SV) superior mesenteric (SMV) veins and stent.

**Results:**

<table>
<thead>
<tr>
<th>PV</th>
<th>SV</th>
<th>SMV</th>
<th>Stent</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMax</td>
<td>Vmean</td>
<td>Vmean</td>
<td>x</td>
</tr>
<tr>
<td>basal</td>
<td>22 ± 9</td>
<td>19 ± 5</td>
<td>12 ± 5</td>
</tr>
<tr>
<td>48 hr</td>
<td>32 ± 14</td>
<td>28 ± 11</td>
<td>15 ± 5</td>
</tr>
<tr>
<td>1 wk</td>
<td>40 ± 24</td>
<td>36 ± 15*</td>
<td>18 ± 8</td>
</tr>
<tr>
<td>4 mos</td>
<td>52 ± 27</td>
<td>35 ± 15*</td>
<td>22 ± 10</td>
</tr>
<tr>
<td>6 mos</td>
<td>47 ± 20*</td>
<td>26 ± 4</td>
<td>21 ± 12</td>
</tr>
</tbody>
</table>

*p < 0.05 least vs basal (pare T test)

The stent mean diameter was 6.9 ± 0.6 mm. After 3 months the VMax in the PV, SV and SMV increased by 104%, 86% and 90% respectively. In 4 patients (26%), after 48 hrs, a thrombosis of the left branch of the PV occurred which later disappeared. Conclusion: TIPS causes a major increase in blood flow velocity in portal vessels. The VMax maximum increase in the stent was reached at 3 months, while a decrease is observed at 6 months. After TIPS a transient thrombosis of the intrahepatic portal branch was observed in some cases.

**Complications and Risks of Transjugular Intrahepatic Portosystemic Shunts in 28 Consecutive Patients**

P. Hulek, A. Krajina, P. Elias, A. Michi, V. Safka, J. Erben, M. Volfova. Charles University Hospital, Hradec Kralove, Czech Republic

**Purpose:** Transjugular intrahepatic portosystemic shunt (TIPS) is used as a safe and effective method for shunt treatment in symptomatic portal hypertension. However, there are significant risks of hepatic encephalopathy and the shunt stenosis. These risks and technical complications were reviewed.

**Material and Methods:** Twenty eight consecutive most cirrhotic patients were treated with TIPS for variceal bleeding (78%) and intractable ascites (22%). In follow-up ranging from 6 to 21 months (mean 8 months). Shunt patency was evaluated by doppler sonography. Shunt velocities below 25 cm/s indicated stenosis. Results: Technical success was achieved in 100%. 30-day mortality was 11%. Early (within 48 hours) thrombosis of the shunt occurred in 3 patients (11%). All these shunts were recanalized. Significant stenosis of the shunt was found in 3 (11%) shunts and shunt occlusion occurred in 1 patient within 3 to 14 months after TIPS. The stenotic shunts responded well to angioplasty and parallel shunt was performed in the patient with shunt occlusion. Progression of hepatic encephalopathy occurred in 4 patients (15%). The thrombus formation in portal vein during the procedure was observed in 2 cases and was aspirated or lysed by local streptokinase infusion. The mediastinal hematoma caused by the brachiocephalic vein injury occurred in 1 patient. Conclusion: (1) Early shunt thrombosis or chronic shunt stenosis are amenable to recanalisation or balloon dilatation. (2) Doppler ultrasonography is accurate in noninvasively assessing shunt stenosis following TIPS. 3) At this time, TIPS placement without careful follow-up cannot be considered as a long term treatment for symptomatic portal hypertension.

**Nutritional Status, Energy Expenditure and Portal Hypertension**

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Estimation of energy expenditure and nutritional assessment may define energy requirements that are of importance in chronic disorder when energy expenditure from normal metabolic requirements and some portal liver diseases (DuBois equation) were used to construct the standard diagram of newly developed age and sex-dependent anthropometric coefficient (AC) for the population 4–18 years on the basis of the equation: AC = W/H^2 × BSA. AC enabled to express nutritional status in a single number that was within the normal range (AC ± 0.5 s.d. standard deviation beyond, indicating nutritional problems). Statistical analysis was performed using unpaired t-test and Yates corrected chi-square test when appropriate; p < 0.05 was considered significant. Patients and controls did not differ with respect to age, body mass (b.m.) and BSA. Resting energy expenditure (REE); after overnight fast, indirect calorim-
Aims: To relate portal pressure with the incidence of esophageal varices obliteration (9 with portal vein occlusion, age 12.56 y ± 3.10; with liver cirrhosis, age 14.00 y ± 3.26) and history of varical bleeding. Under nutrition was diagnosed in 3 controls and in 12 patients (p < 0.05). REE (per kg b.m.) in controls and patients were: 121.87 ± 21.50 kJ and 142.50 ± 32.91 kJ respectively (p < 0.043). REE (per 1.73 m²) were: 6643.97 kJ and 7456.01 kJ resp. (p<0.003). Substrate utilization rate for controls and patients were: glycogen: 1.90 g/kg b.m. and 2.23 g/kg b.m. resp. (n.s.); fat: 1.55 and 2.01 g/kg b.m. resp. (p<0.04); protein: 1.51 g/kg b.m. and 1.23 g/kg b.m. resp. (n.s.). Conclusions: Portal variceous varices are prone to be malnourished as revealed by REE. Increased REE with increased fat utilisation rate can explain that finding.

1651 A Prospective, Randomized Trial of Injection Sclerotherapy vs. Banding Ligation in the Management of Bleeding Esophageal Varices


Aims: To compare the efficacy and complications between sclerotherapy and ligation in the management of bleeding esophageal varices. Methods: 120 patients admitted to our hospital with acute esophageal variceal bleeding were randomized to receive sclerotherapy (EIS group) or band ligation (EVL group). All of them received treatment within 24 hrs of index bleeding. Sclerosant 1.5% Sotradecol and Steigmann-Goff ligator were used, respectively. Endoscopic treatment was repeated at an interval of 2-3 weeks until varices obliterated.

Results:

<table>
<thead>
<tr>
<th>EIS group (N = 59)</th>
<th>EVL group (N = 61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-hepatic cirrhosis</td>
<td>43 (73%)</td>
</tr>
<tr>
<td>Pugh’s grade A/B/C</td>
<td>12.4%41%/47%</td>
</tr>
<tr>
<td>Control of active bleeding</td>
<td>12(20%)</td>
</tr>
<tr>
<td>Recurrent bleeding</td>
<td>26 (44%)</td>
</tr>
<tr>
<td>Ectopic varices bleeding</td>
<td>13 (3%)</td>
</tr>
<tr>
<td>Obliteration</td>
<td>37 (63%)</td>
</tr>
<tr>
<td>Sessions to obliteration</td>
<td>6.5 ± 1.2</td>
</tr>
<tr>
<td>Patients with complications</td>
<td>16 (27%)</td>
</tr>
<tr>
<td>Patients with mortality</td>
<td>19 (32%)</td>
</tr>
</tbody>
</table>

*p < 0.001

Conclusions: Endoscopic variceal ligation causes significantly fewer complications than sclerotherapy. In addition, EVL prevents rebleeding from esophageal varices more effectively than EIS does. However, higher frequency of ectopic varices bleeding may be encountered by EVL.

1652 The Impact of Endoscopic Variceal Ligation on the Pressure of the Portal System


Background: Endoscopic variceal ligation (EVL) is a viable substitute for endoscopic injection sclerotherapy. The complications of EVL have been proven to be fewer than those of sclerotherapy. It is still unknown how EVL may influence the pressure of portal venous system.

Methods: 19 patients (18 males, one female, mean age, 60 ± 9 yrs) with history of esophageal varices bleeding and without ascites were enrolled. All were cirrhotic patients (63% were post-hepatic). EVL was performed at an interval of 2-3 weeks until varices were obliterated. Measurements of portal pressure: Portal-spleno venogram was performed before EVL and after varices obliteration to assess venographic findings. The pressures of main portal vein (PVP), splenic vein (SVP) and superior mesenteric vein (SMVP) were recorded.

Results: 16 patients completed the study. A mean of 4 sessions of EVL within the duration of 2 months was needed. 11 (69%) patients had an elevated pressure and 5 (31%) patients had a reduced pressure after EVL. Mean portal venous pressure before and after EVL was 26.0 ± 4.4 mmHg and 27.9 ± 6.5 mm Hg, respectively (p < 0.05). Among patients with an elevated pressure change, PVP increased by a mean of 24%, SVP increased 18% and SMVP increased 19%. Among patients with a reduced pressure change, PVP decreased 24%, SVP decreased 26% and SMVP decreased 22%. Three patients had rebleeding, all belonged to those with an increased portal pressure change.

Conclusions: 1. EVL induced an increased portal pressure by 24% in 70% patients and reduced portal pressure by 24% in 30% patients. 2. Increased portal pressure induced by EVL may result in the occurrence of rebleeding.

1653 Postprandial Portal Hypertension in Cirrhotic Patients as a Marker of Liver Disease and Portal Hypertension

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Previous studies have shown an increase of portal pressure in cirrhotic patients during postprandial states. This increase is caused by an increase in hepatic blood flow, a phenomenon known as postprandial hyperemia. This study was designed to determine whether postprandial hyperemia might be an indicator of severity of liver disease and portal hypertension.

Materials and Methods: Portal flow was measured in 66 patients during fasting and 30 minutes after a standardized meal with an Acuson 128 Doppler system (Mountain View, CA). The degree of portal hypertensive gastropathy and esophageal varices was evaluated by endoscopy.

Results: After the meal the increase in portal flow was significantly lower in patients with severe gastroopathy (+23%) and esophageal varices (+26%) compared to patients without gastric lesions (-39%, p < 0.03) and those without esophageal varices (+45%, p < 0.01). Postprandial portal flow increase was diminished in patients with esophageal bleeding or red spots (+24%) compared to non-bleeders (+37%, p < 0.05). Patients taking vasodilatory drugs had a smaller increase of postprandial portal flow (+21%) than patients without this medication (+37%, p < 0.05). Concerning the CHILD score there was a smaller increase in mean portal flow (PF) and volume flow (VF) in patients with higher grading (CHILD A PF +46%, VF +45%; CHILD B PF +32%, VF +33%; CHILD C PF +25%, VF +25%, p < 0.005). In contrast to postprandial flow, fasting portal venous blood flow did not correlate with bleeding risk or clinical scoring.

Conclusions: The postprandial portal hyperemia measured by doppler ultrasound is inversely correlated with the severity of liver disease and portal hypertension. Small flow velocity increases may indicate a higher risk of variceal bleeding.

1654 Clinical and Endoscopic Results in Cirrhotic Patients Submitted to the Transjugular Intra Hepatic Portosystemic Shunt (TIPS)

M. Merli, O. Riggio, R. Servi, A. De Santis, V. Rinaldi, A. Bolognese, V. Zipparo, P. Rossi, L. Capoccia. 2a Gastroenterolog., 1° Clinica Chirurgica, Radiologia Universita "La Sapienza" di Roma, Italy

This report describes clinical results in 20 cirrhotic patients (14 M and 6 F mean age 62 ± 6 yrs) undergoing TIPS for variceal bleeding (n 18) or intractable ascites (n 2). Liver disease was postviral in 85%. Child Class was A in 14 and B-C in 6 patients. At present the mean follow-up is 6.27 ± 4.7 months range 2-18 months in survivors. The mean portosystemic gradient decreased from 30 ± 5 to 11 ± 4 cm H2O. In one patient bleeding could not be stopped and the patient died after 24 hrs. Another patient died after 30 days due to hepatorenalo. Varices were evaluated by endoscopy using the NIEC score before, at 1 week and at 3 and 6 months after TIPS. A sharp decrease in the severity of esophageal varices was already observed after one week (basal score 3.88 ± 1.21 vs one week 1.36 ± 1.6 p < 0.0001) and was maintained at 6 months (score 1.5 ± 1.4). Bleeding occurred in 1 patient after 60 days from a small residual esophageal varices and was successfully treated with sclerotherapy. Congestive gastropathy (CG) was observed in 8 patients before TIPS. After 3 months CG was unmodified but at 6 months an improvement in the degree of CG was observed in 5 patients. During follow-up 4 patients manifested a stent stenosis (2, 3, 7, 8 months post TIPS), evidenced by doppler US as a reduction in blood velocity in the stent, which was treated with angioplast (2 cases) or with a second stent implantation in 2 others. In conclusion TIPS is a feasible procedure for the treatment of variceal hemorrhage in cirrhotic patients, varices almost disappeared in the majority of patients, CG was ameliorated, only 1 bleeding episode was observed within 6 months. Doppler-US is useful in monitoring stent patency.

1655 Somatostatin as an Adjuvant to Emergency Sclerotherapy of Bleeding Esophageal Varices

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Introduction: - Acute sclerotherapy (AS) is considered to be an useful and difficult technique because of the critical situation of the patient and the un-optimal viewing condition. Somatostatin reduces splanchic blood flow and portal pressure. Our aim was to evaluate in a double-blind way the usefulness of the simultaneous injection of a bolus of somatostatin as an adjuvant to AS.

Material and Methods: - 63 patients with bleeding esophageal varices were admitted to the trial. 33 received a bolus of 250 mcg of somatostatin. The remaining 30 received a placebo. All of them were actively bleeding. AE was carried out by injecting ethanolamine oleate near to the bleeding point.
The following variables were recorded: liver function, amount of scolostatis, hemodynamic condition, hernorrhagic activity, duration of the procedure, units of transfused blood, hemorrhagic recurrence and mortality. An overall index of technical efficacy (ITE) was defined as the product: (number of injections required × viewing condition (1–3) × subjective feeling of technical difficulty (1–3)). Data were compared by t-student and chi-square tests.

Results - Both groups were similar on the following parameters: age, hemodynamic condition, degree of patient’s collaboration, activity of hemorrhage and liver function. Although not significantly, more treated patients (14/33) had bled from gastric subcardiac varices than placebo patients did (7/30) (p = 0.1). Once the drug was administered, more treated patients ceased to bleed during the injection (21/33) than control patients (11/30) (p = 0.03). The amount of administered sclerosant was superior in the control group (3.2 ± 0.5 mL vs 2 mL vs 9.4 ± 3 mL, p = 0.004). The ITE was significantly better in the treated group (3.5 vs 6.4, p = 0.03). On the contrary, no differences were registered in: units of transfused blood, recurrence of hemorrhage, mortality or time spent in the procedure.

Conclusion - The administration of a bolus of 250 mg of scolostatin results in an amelioration of the technical easiness of AS even though it does not seem to substantially change the final result of the procedure in skilled hands. This therapeutic complement could allow AS to be undertaken not only by highly skilled endoscopists, but also by gastroenterologists with a moderate expertise on therapeutic endoscopy.

1658 | Congestive Gastropathy with Liver Cirrhosis

Norio Nakayama, Teunen Ozeki, 1 Shigiyuki Kono, Shinich Sugano, Yoshihiko Motojima, Tametsune Ohkawai, Yosuo Shimizu. The Department of Gastroenterology, Ohtsuhiri Hospital, Kitakyushu, Japan.

We have had gastrointestinal surveys of many patients with congestive gastropathy complicated to liver cirrhosis. However, redenning and edema of gastric mucosa were not found in cases with congestive gastropathy, but chronic gastropathy (CG). Therefore, the differential diagnosis as for the two diseases was considerably difficult. We tried to solve this problem and report a considerably successful diagnostic method using endoscopic toluidine blue dye-spraying technique for congestive gastropathy. [Materials and Methods] Endoscopic toluidine blue dye-spraying was carried out in 25 patients with congestive gastropathy complicated in liver cirrhosis and 30 patients with chronic gastropathis. In gastroscopy, the change metachromasia of colour after spraying the mucosa with reddening was observed and biopsy specimens of the same gastric portion were taken. Furthermore, gastric juice was collected by aspiration. Histological diagnosis was done by HE. Histological staining using toluidine blue before and after chondroitin ABC digestion was carried out. The measurement of chondroitin sulfate in gastric juice was carried out using chondroitinase digestion method. [Results] In endoscopic findings, diffuse reddening of mucosa in the greater curvatur of body was stronger in congestive gastropathy than in chronic gastritis, but the chronic gastritis, respectively, erythematous edematous reddening and edema were often found in the greater curvature of body. As for spraying pattern in body of congestive gastropathy, mucosal blue colour pattern was 35% and the mixed pattern of blue and purple pattern was 60%. Histological staining of blue in specific zone of chronic gastritis revealed staining metachromasia staining of goblet cells but after chondroitin ABC digestion, metachromasia staining pattern almost diminished. In congestive gastropathy, metachromasia of goblet cells was very weak. Furthermore the amount of chondrin sulfate A B C in gastric juice of congestive gastropathy was lower than that chronic gastritis (decrease to about 40%). [Discussion] Toluidine blue is famous for metachromasia staining for chondrin sulfate. Patients with chronic gastritis more than 50 years old, have almost histological metaplasia. Therefore, chondrin sulfate was secreted from goblet cells into gastric juice. However, in patients with congestive gastropathy the amount of chondrin sulfate in gastric juice is considerably less in congestive gastropathy than chronic gastritis, because the production of chondrin sulfate might be inhibited by congestion. [Conclusion] It was strongly suggestive that the gastric production of chondrin sulfate in congestive gastropathy might be inhibited because of congestion. The fact was also certified using endoscopic toluidine blue spraying and useful for the diagnosis.

Before TIPS Child class was C in 2, B in 4 and A in 14 and no patient had a previous history of HE. All patients received lactulose therapy in the previous week and thereafter. The PSE index according to Conn was assessed before and after TIPS and after 7, 30, 90 days and then every 3 months. All episodes of HE which occurred at any time were assessed and recorded. 3 patients died before the first month, 17 completed 3 months and 13 completed 6 months of follow up. During the first 3 months after TIPS 1/20 patients (65%) had one or more episodes of HE. HE reached grade III-V in 5 patients. PSE index was higher than 0.25 in at least 2 patients but indicative and expectantly and two patients (29%), indicating chronic HE. Several variables were tested but failed to correlate to the development of HE, these were age, etiology of liver disease, and the Child class, Conn index, ammonia levels, galactose elimination capacity and liver volume before TIPS, the stent diameter and the post-TIPS porto systemic gradient. The PSE index was significantly correlated to the mean velocity of blood flow into the stent at 4 weeks (r = 0.65; p < 0.02). Between 3 and 6 months of follow up 4/13 patients (31%) had episodes of HE. In 3 of these patients a stable impairment of PSE index was found. In conclusion the incidence of episodic HE is high after TIPS but tends to drop after the first 3 months. A stable chronic elevation in the PSE index is still present in 23% of patients at 6 months although the alteration in mental state never exceeded grade I.

1659 | Modifications in Liver Function After Transjugular Intrahepatic Portosystemic Shunt (TIPS)

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This study describes the modifications in liver function in 20 cirrhotics (14 M, 6 F age 63 ± 7) who underwent TIPS for varical bleeding (18 pts) or for intractable ascites (2 pts). Child class, liver tests, and liver and spleen diameter (US measurement) were evaluated in all patients before and 2, 7, 30, 60 and 180 days after TIPS. The galactose elimination capacity (GEC) was performed before and at 6 months. 3 patients died within the first month, 17 completed 3 months and 13 completed 6 months of follow up. Results:

<table>
<thead>
<tr>
<th>Child T score</th>
<th>GEC (mg/kg/min)</th>
<th>ALT (u/l)</th>
<th>Bil (mg%)</th>
<th>Proth Test</th>
<th>Liver Dam (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 ± 2.1</td>
<td>4.2 ± 1.1</td>
<td>50 ± 20</td>
<td>1.8 ± 1.2</td>
<td>62 ± 16</td>
<td>13 ± 2</td>
</tr>
</tbody>
</table>

*p < 0.01 vs baseline (paired T test)

In the first week jaundice developed in 6 patients (30%). In 3 patients this was due to hemolysis, with an increase in unconjugated bilirubin, a decrease in hemoglobin and the presence of schistocytes. A sharp transient increase in ALT (up to 800 u/l) and a reduction in Proth Act indicates that liver necrosis accompanied jaundice. In other 3 patients, liver function after TIPS Child score and bilirubin increased while liver diameter decreased compared to baseline. These modification were no longer evident 3 and 6 months later suggesting that liver function is not deteriorated by TIPS. Liver and spleen diameter were decreased after TIPS. These modifications are probably due to a reduced portal pressure and remained stable up to 6 months.

1657 | Incidence of Hepatic Encephalopathy (HE) in Cirrhotic Patients Submitted to the Transjugular Intrahepatic Portosystemic Shunt (TIPS)


Twenty cirrhotic patients treated with TIPS were followed up prospectively to determine the incidence of hepatic encephalopathy after this procedure.

40% of the first 8B episodes in cirrhotics occur within the first 6 mths of observation [J. Hepatol. 18 (5) 510-521, 1993]. This study was aimed to identify the risk factors for early and late occurrence of hepatic encephalopathy. We studied 155 consecutive cirrhotics with varices and without previous VBU. At entry and at six months intervals the severity of liver disease and the appearance of varices were assessed according to the Child-Campbell classification and the JRSHPH endoscopic rules. During a mean 6m period of 25.0 (±17.5) mths 24% of the patients had VBU, 38% did so within 6 mths. The VBU rates were estimated at each 6 mths interval by life tables, Breslow (early differences) and Mantel-Cox test (overall differences). The table shows the incidence: variceal size (VS), cherry red spots (CRS), ascites, nutritional status were associated with the early and overall occurrence of VBU through the study period. During the VBU period in 28 of 4%, in 27% of 6 and in 6% of F3 varices. The actual overall rate of VBU for those that ultimately had F1, F2 and F3 was: 3%, 20%, 70%. The cumulative rate of early VBU (<6 mths) was 50% in F3 varices present from entry and 16% in F3 varices developed.
during f-u (P = 0.04); 8% in F2 present from entry and 0% in those developed during f-u (P ≈ ns). The figures for late (>6 mths) VB were 67% for F3 from entry and 70% for F3 during f-u (P = ns), 50% for F2 at entry and 34% for F2 during f-u (P = ns). Conclusions: (1) By univariate analysis VS seems to be the most important variable in predicting the first VB. (2) Different treatment strategies should be used for F2 and F3 varices. (3) Regular endoscopic f-u is needed to improve the prediction criteria for the first VB.

**Cumulative % of bleeding at 6 mths intervals**

<table>
<thead>
<tr>
<th>Time (mths)</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>13%</td>
<td>50%</td>
<td>84%</td>
</tr>
<tr>
<td>1-3</td>
<td>7%</td>
<td>47%</td>
<td>63%</td>
</tr>
<tr>
<td>3-12</td>
<td>4%</td>
<td>32%</td>
<td>61%</td>
</tr>
<tr>
<td>12-24</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

**1960 Non-Shunt Surgery for Bleeding Varices. 12 Years Experience**

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During the period from 1979 to 1991, 596 cases of splenectomy and devascularization were done electively for portal hypertension patients with history of moderate, massive or repeated attacks of haematemesis and or melena (elective group). 41 case of the same procedure were done for patients with acute variceal hemorrhage which failed to be controlled with emergency sclerotherapy (emergency group). All patients were Child A & B. The mean age of the patients was 34.6 ± 10.5. Male to female ratio was 9:1. Complete liver functions, kidney functions, complete blood picture and upper gastro intestinal endoscopy were done for all patients. Needle liver biopsy was done for 554 patients from the elective group. The pathology was schistosomal in 36.8%, mixed schistosomal and cirrhotic in 33.4% and non-schistosomal in 29.8%. The operation was done by the technique of Hassab (1962). Splenectomy & devascularisation gives immediate control of bleeding in 92.7% of emergency group. Hospital Mortality was 3.18% 2.2% in both groups respectively. All patients were followed up for 50 ± 31 month. Recurrent rebleeding was 15.3% in both groups respectively. Encephalopathy developed in 2.5% in both groups. Late mortality was 8.55% 9.7% in both groups respectively. We concluded that splenectomy & devascularisation was able to control bleeding both in emergency and elective cases with acceptable recurrence rate of rebleeding and low rate of encephalopathy.

**1961 Portal Haemodynamic Response to a Very Low-Dose Nitroglycerin in Cirrhosis**


A low dose of nitroglycerin (NTG) predominantly dilates the venous system. Portal haemodynamic responses to a very low dose of NTG were studied in patients with portal hypertension and cirrhosis, compared with those to an usual dose of coronary heart disease. A 0.15 mg of NTG was sublingually given to 10 patients (LDG) and a 0.3 mg to another 10 patients (UDG). Haemodynamic measurements under the hepatic and right cardiac catheterization were carried out before and 5 min after NTG administration. Wedged hepatic venous pressure (WHVP) reduced after NTG by 8%; p < 0.01 in LDG, and by 15%; p < 0.01 in UDG. Hepatic blood flow with ICG did not change in both groups. In LDG, azoxyg blood flow (AZF) did not change in contrast to a significant decrease by 11%; p < 0.05 in UDG. Mean arterial pressure fell by 4%; p < 0.05 in LDG and by 16%; p < 0.01 in UDG. Cardiac index did not change in LDG, but it decreased by 12%; p < 0.05 in UDG. In LDG as well as UDG, mean pulmonary arterial pressure and pulmonary capillary wedge pressure significantly fell and the magnitude of these falls in both groups were same. In UDG, a correlation between changes in WHVP and AZF (r = 0.7; p < 0.05) was observed. This suggested that splanchic vasodilatation mediated by high-pressure, rather than low-pressure, baroreceptor reflex mainly contributed to a decrease in portal venous blood flow, resulting in a WHVP reduction. Whereas, a slight but significant fall of WHVP induced by a very low dose of nitroglycerin might be due to venodilatation including hepatic vascular bed.

**1962 Flow and Intestinal Transport in Chronic Biliary Anastomoses**

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**Aim of the study:** Disadvantages of Roux-Y biliary anastomoses are duodenal bypass of bile and the lack of an endoscopic access to the biliary anastomosis. Recently hepato-jejuno-duodenal interposition (HJD-IP) has been propagated to overcome these problems. The aim of our study was to investigate the changes in bile flow in these procedures.

**Methods:** 15 cholecystectomized mongrel dogs were operated as follows: RY-BA using a 30 cm jejunal loop (n = 5), HJD-IP with a 15 cm jejunal segment (n = 5), no additional procedure (control-group, n = 5). Four months postoperatively all animals underwent a hepato-biliary scintigraphy using 99mTc Hepatobid® and a Picker Dyna-Camera-4.

**Results:** Rats were used for I.V. or enteric feeding. Rats with portal hypertension and/or portal obstruction were divided into various subgroups. The bile flow, percentage of bile acid, and bile acid composition were measured. The results were compared with those of normal rats.

**Conclusion:** The changes in bile flow, percentage of bile acid, and bile acid composition are significantly different in the various subgroups.

**1963 The Mechanism of Pentagastrin Related Inhibition of Small Bowel Bioelectric Activity – An Experimental Study on the Rat**

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It has been shown that large doses of Pentagastrin (PG, 0.06-0.10 mg/kg BW) brings about the inhibition of small bowel bioelectric activity (SBEA), which is suspected to be caused by a decrease in blood flow due to vasoconstriction. Our aim was to investigate the mechanism of action of PG and the correlation of its effects with the O2 balance in the bowel, which can be of value as an important prognostic sign in various surgical conditions of the intestine, especially in small bowel transplantation.

**Methods:** The study was conducted in 15 murine small bowels in vivo and in vitro. The latter in conditions of bowel perfusion in oxygenated (pO2 = 450 mm Hg) and oxygenated (pO2 = 100 mm Hg) Krebs solution (KES) at 37°C. Under Triopetal narcosis in 7 rats (control group) the native SBEA and its reaction to intravenous PG administration (0.06 mg/kg BW) were registered with silver bipolar electrodes of the clip type. Then 5 cm of the central ileum was isolated and placed in un oxygenated KES. The SBEA and the PG effect were recorded. Afterwards the bowel was transferred to oxygenated KES and the same procedure was repeated. 8 rats (test group) were saturated with an antihypoxic substance (carotene like substance, 5 mg/kg BW) and procedures were repeated as mentioned above.

**Results:** In vivo the SBEA readily vanished to a straight line on PG administration in the control group. This effect was absent in the test group. In hypoxia in vitro the control group again showed a vanishing tendency of the SBEA on PG, while the test group documented no change. In normoxia in vitro the control group showed a decrease in the amplitude and the frequency parameters of the SBEA on PG, but not to the extent of vanishing. The test group, here, recorded an increase in the SBEA values on PG.

**Conclusion:** We conclude that the reaction of the SBEA to high doses of PG is related to the direct action of PG on the smooth musculature and activation of the intramural neural elements through the decrease in the oxygen uptake by the tissue. We suppose that a "high-dose PG test" may serve as an intraoperative test of the bowel in surgical interventions and transplantation.
Portal hypertension

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