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Multiple Cool Tip Radio-frequency Ablation Probes and a Switching Controller Compared to Standard Clustered Radiofrequency Probes in the Porcine Model
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PURPOSE: Evaluation of the Switching Controller with multiple, combined cool tip probes for an output-based radiofrequency device
METHODS: Radiofrequency (RF) ablation was performed in three randomly selected segments of the liver in 12 pigs. Half of the ablations were performed with a Pringle maneuver

and half without. Ablations were performed with three 3.0 cm active tip, cooled LiF probes spaced 2.0 cm. apart and a 200 watt RF generator. Ablations using the standard cluster of probes were performed for 12 minutes in the non-Pringle subgroup and 6 minutes in the Pringle subgroup. Ablations using the Switching Controller with multiple, combined cool tip probes were performed for 16 minutes in the non-Pringle subgroup and 8 minutes in the Pringle subgroup. The Switching Controller delivered current that alternated among the probes, based on impedance (to 30 Ohms above baseline) and time (up to 30"). The ablation dimensions, volume, temperature, current delivery parameters and histology were evaluated. **RESULTS:** A total of 34 ablations were performed. The minimum ablation diameter (Dmin) in the standard cluster group was 40.3 ± 4.3 mm (42.5 ± 4.1 mm for the Pringle group and 38.1 ± 3.6 mm for the non-Pringle group). The maximum ablation surface area (SAm_{ax}) in this group was 16.0 ± 3.3 cm² (17.6 ± 2.2 sqcm for the Pringle group and 14.2 ± 3.5 cm² for the non-Pringle group). The ablation volume in the cluster group was 36.9 ± 9.5 cc (40.1 ± 8.1 cc for the Pringle group and 33.7 ± 10.4 cc for the non-Pringle group). In the Switching Controller Multiprobe group, the ablation Dmin was 51.4 ± 7.4 mm (54.5 ± 8.5 mm for the Pringle group and 48.2 ± 4.8 mm for the non-Pringle group). The ablation SAm_{ax} in this group was 22.4 ± 4.7 cm² (23.9 ± 4.9 cm² for the Pringle group and 20.8 ± 4.1 cm² for the non-Pringle group). The ablation volume in the multiprobe group was 66.1 ± 17.9 cc (68 ± 16.8 cc for the Pringle group and 64.3 ± 19.6 cc for the non-Pringle group). **CONCLUSIONS:** Technology to increase the size of ablated areas and shorten the procedural time evolves. The use of the Switching Controller resulted in ablation of lesions with larger Dmin, SAm_{ax} and volume than with the standard cool tip cluster. The Pringle maneuver lead to the creation of an equally sized lesion in half of the time.

Cluster	Dmin(mm)	SAm _{ax} (cm ²)	Vol(cc)
	40.3	16.0	36.9
Multi	51.4	22.4	66.1
p value	< 0.0001	0.0002	< 0.0001

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Clinical Significance of Laparoscopic Splenectomy for Hypersplenism of Liver Cirrhosis

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Background: Laparoscopic splenectomy (LS) is widely accepted as a treatment for hematological disorders such as ITP. However, it remains controversial that LS could be safely performed in liver cirrhosis, because of its bleeding tendency and development of collateral vessels. In this study, we aimed to evaluate the safety and clinical significance of the procedure for Hypersplenism due to liver cirrhosis.

Patients & Methods: From June1994 to September 2004, 110 cirrhotic patients with Hypersplenism underwent LS. First, to determine the safety and efficacy of LS, we compared the results of LS in cirrhotic patients (n= 110; LS group) with those of conventional open splenectomy in cirrhotic patients at the same period (n = 20; OS group). Next, we evaluated the clinical significance of LS in liver cirrhosis. The indications for LS were bleeding tendency due to thrombocytopenia (n = 57), difficulty in receiving treatment for hepatocellular carcinoma (HCC) due to thrombocytopenia (n = 38), and sclerotherapy-resistant esophagogastric varices (n = 32).

Results: (1) There was no death related to the operation in both groups. The average operation time was 258 and 276 min in LS and OS group, respectively (p=0.61). The average blood loss was as low as 352mL in LS group, compared with 1600mL in OS group (p < 0.01). The average hospital stay was shortened to 15.7 days in LS group, compared to 24.0 in OS group (p< 0.01). The ingestion started 1.5 days and 3.0 days after the operation, in LS and OS group, respectively (p < 0.05). (2) Although the average preoperative platelet count was 4.7x10⁴mm³ it had been maintained at over 10.0x10⁴ mm³ for over three years. After the operation, total bilirubin level was significantly improved from 1.4mg/dL to 1.1 mg/dL and prothrombin time was significantly increased from 56% to 68%.

Thirty-two patients with HCC successfully underwent treatment for HCC such as chemotherapy, PEIT and ablation therapy by the increase in the platelet count. Six patients could receive the interferon therapy for hepatitis C after the operation. So far, there has been no recurrence of esophagogastric varices.

Conclusions: A laparoscopic splenectomy is likely to be a safe and effective procedure even in liver cirrhosis and it also impacts on the strategy for treatment of disorders related to liver cirrhosis.

M2043

Gastric Reduction Duodenal Switch Operation Has No Detrimental Effects on Hepatic Function and Improves Hepatic Steatosis
 Ara Keshishian

Gastric Reduction Duodenal Switch operation has no detrimental effects on hepatic function and Improves Hepatic Steatosis

Objective:

To evaluate the changes in the hepatic function and architecture, after Gastric Reduction Duodenal Switch operation (GR-DS) for treatment of morbid obesity.

Background:

Nonalcoholic steatohepatitis (NASH) is the most common histological finding in morbidly obese patients undergoing liver biopsy. Biliopancreatic diversion has been used for the treatment of morbid obesity and hepatic steatosis, and very few cases of liver impairment as a complication of this operation have been reported. Our experience with GR-DS operation demonstrates improvement in liver Steatosis, without any evidence of hepatic dysfunction.

Methods:

We have to date (1999-2004) performed 732 GR-DS operations for treatment of morbid obesity. As per previously published literature and our protocol, routine liver Tru-Cut needle

biopsy is performed during the GR-DS surgery. Liver function tests (LFTs) are assayed pre-operatively as well post-operatively at 6, 12, and 18 months and yearly thereafter. Repeat Tru-Cut biopsy of the liver is performed on all the patients who underwent a second intra-abdominal surgery for any indication (n = 82). To obtain blinding, the pathologist evaluated the two sets of liver biopsies independently, without comparison between the two. In particular the adipose tissue content and the degree of Piepym's "mpa"l in these patients.

Results:

	ALT-Pro	ALT-6M	ALT-12M	ALT-24M	ALT-36M	ALT-48M
Ma	26	31	26	27	27	19
STDEV	19.6	23.3	16.8	17.3	21.0	12.9

	AST-Ppro	AST-CM	AST-	AST-24M	AST-36M	AST-48M
Median	22	24	21	22	23	18
STDEV	137	13.6	147	14.0	18.7	9.6

Conclusion:

GR-DS operation improves the hepatic steatosis and the resulting inflammation. Unlike previously published data, no detrimental effects on the hepatic functions were noticed.

M2044

High Rates of Gallbladder Cancer in New Zealand Maori: An Interplay of Disease and Social Factors

Jonathan Koea, Andrew Sporle

introduction. Carcinoma of the gallbladder (GBC) is a rare cancer which has a defined geographical distribution with the highest incidence observed in South America and Asia. The indigenous population of New Zealand (NZMaori) also has an elevated rate of GBC for reasons that are unclear.

Methods. Diagnostic and procedural data for NZ Maori, Pacific Islanders and European New Zealanders was obtained from the National Cancer Registry of New Zealand for 1988 - 2001 inclusive. Data were stratified for ethnicity, admission rate with gallstone related disease (biliary colic, cholecystitis, cholelithiasis, cholangitis and pancreatitis), admissions with sepsis (cholecystitis, cholangitis and pancreatitis), and procedure (laparoscopic or open cholecystectomy). National census statistics were used to calculate age standardized incidence rates.

Results. Between 1988 and 2001 the age standardized rates for GBC in Europeans was 0.36/100,000 in men and 0.70/100,000 in women; and 0.32/100,000 in Pacific Island men, 0.76/100,000 in Pacific Island women. In the same period the age standardized rates for GBC in NZMaori were 1.49/100,000 in men and 1.59/100,000 in women with NZ Maori having 3.5 times the relative risk of non-Maori in developing GBC (95% Confidence Interval; 2.1-5.0).

	Admission Rate	% Admissions with Sepsis	Cholecystectomy Rate
NZMaori	27/100,000	62%	5/100,000
Pacific	33/100,000	68%	23/100,000
European	22/100,000	37%	31/100,000

NZMaori were nearly twice as likely to be managed with an open cholecystectomy than Pacific or European patients (relative risk 1.65; 95% confidence interval 1.41-1.89). **Conclusions.** The high rates of GBC observed in Maori reflect a high incidence of gallstone related disease and a low rate of cholecystectomy. Maori are more likely to be hospitalised with septic complications related to gallstone disease and more likely to be managed with open cholecystectomy.

Microwave Ablation with Dual Loop Probes: Results of a Phase I Clinical Trial
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INTRODUCTION: A number of options are available to patients with hepatic tumors not amenable to a curative resection. Local ablative techniques have expanded the patient population amenable to treatment, but local recurrence rates after the most common ablative technique (radio-frequency ablation) remain high particularly adjacent to blood vessels. Microwave ablation results in a larger area of active heating and may offer some theoretical advantages compared to RFA.

METHODS: We developed a dual loop probe apparatus which consists of two 13-gauge needles through which 24-gauge loop antennas (2.7 cm in diameter) are deployed. The loops are canted at 45 degrees. This orientation resulted in the most consistent lesions in prior animal models. We evaluated the ability of this device to ablate tumor inside the loop. **RESULTS:** Five patients underwent 6 ablations followed by resection of the ablated liver. There was no toxicity related to the device. All tumor and normal tissue within the loop was ablated. Ablation volume was 28.2 ± 8.4 cm³. Tumor adjacent to blood vessels within the loop was dead. No distortion of the microwave lesion was created by proximity to blood vessels.

CONCLUSIONS: Microwave ablation by the dual loop probe system is a safe alternative for patients with hepatic tumors who are not candidates for a curative resection. Ablation with the system resulted in complete tumor kill at the ablation/tumor interface as well as adjacent to surrounding blood vessels. The advantages of this configuration includes its ability to completely encircle a tumor, and deliver large amounts of precisely targeted microwave energy to the tumor with minimal damage to tissue outside the loop.