

adequate number of harvested lymph nodes was registered with a small intraoperative blood loss and low complications rate. Robotic surgery actually shows very interesting aspects and promising outcomes that could offer some benefits for the treatment of gastric cancer with minimally invasive approach.

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## ROBOTICS AND NEW TECHNOLOGIES

### Abstract 59

#### Experimental study on hepatic vascular resistance

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Liver function and hepatic regeneration are strictly related to the intrahepatic hemodynamic, especially in portal overflow states as occurring after hepatic resection and partial liver transplantation. Enhanced portal flow drives the regeneration process but is also linked to the development of small for size liver syndrome in liver with reduced compliance.

In order to establish a correlation between the portal flow and the intrahepatic pressure drop, we constructed a pc-controlled, ex-vivo normothermic and oxygenated liver perfusion system.

Livers were isolated under general anesthesia from male Sprague–Dawley rats. Livers were perfused through the portal vein with oxygenated Krebs solution at 37 °C within a re-circulating system: a computer-controlled peristaltic pump allowed a given flow in time.

The portal flow was kept constant in time, starting from physiological value ( $\approx 1$  ml/min/g) and increased by successive steps up to fivefold and then decreased to normality; each flow value was kept constant for five minutes.

The pressure was continuously monitored just upstream of the liver, and the outflow pressure was kept constant and equal to the atmospheric pressure.

The size of the pressure change is proportional to the flow change, thus the curve  $p - Q$  is approximately linear. However, within each step the pressure progressively decreases during the phase of increasing flow and progressively increases during the phase of decreasing flow. Time change (decrease) in pressure is also observed in experiments in which the flow is kept constant for longer time (30 min). As a consequence we observed a hysteretic effect, such that the pressures attained during the phase of discharge increase are slightly larger than those experienced in the phase of flow decrease. The intensity of this hysteretic effect varies with the duration of each step at constant flow. Standard histology showed a slight sinusoidal dilatation in the periportal zone.

In conclusion, the livers showed a typical visco-elastic behavior that may be explained assuming that the total perfused area slowly grows as the flow is increased and vice versa. The amount of augmented perfused area related to sinusoidal dilatation or related to intraparenchymal redistribution of flow is still under investigation.

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## PANCREAS 12

### PANCREAS

#### Abstract 7

#### Electrochemotherapy with bleomycin in locally advanced pancreatic adenocarcinoma

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Electrochemotherapy is effective in treatment of various cutaneous tumors and could be translated into treatment of deep seated tumors. With

this aim, a prospective clinical phase I/II study was conducted to evaluate feasibility, safety and efficacy of intraoperative Electrochemotherapy (ECT) in locally advanced pancreatic adenocarcinoma. Secondary endpoint was to evaluate treatment response in terms of quantitative morphological and functional criteria based on Magnetic Resonance Imaging.

Twelve consecutive patients were enrolled in a clinical phase I/II study approved by the Ethical Committee of National Cancer Institute of Naples. Electrochemotherapy with bleomycin was performed during open surgery, by insertion of electrodes into and around the tumor according to the individualized treatment plan. All patients underwent MR and CT scans, before and after ECT treatment, using morphological and functional imaging. RECIST criteria were used to evaluate ECT response on TC images and quantitative parameters were used to evaluate ECT response on MR images.

No acute and/or postoperative serious adverse events related to electrochemotherapy were observed; no clinically significant electrocardiographic, hemodynamic, or serum biologic changes were noted. No clinically relevant elevation of amylase or lipase levels was observed in any patient and no bleeding or damage to surrounding viscera occurred. Functional imaging based on MR has shown more suitable to evaluate ECT response in patients with locally advanced pancreatic adenocarcinoma than TC imaging.

Electrochemotherapy of locally advanced pancreatic adenocarcinoma proved to be feasible, safe and effective treatment modality. Dynamic and diffusion MR imaging is more suitable to assess ECT treatment response than TC imaging.

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## PERITONEAL CARCINOSIS 13

### PERITONEAL CARCINOSIS

#### Abstract 26

#### Peritoneal surface malignancies computerized staging system

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Peritoneal surface malignancies (PSM) are usually staged with Sugarbaker's peritoneal cancer index (PCI) and completeness of cytoreduction score (CC-S). Even though these staging tools are essential for selecting patients and evaluating outcome after cytoreductive surgery (CRS) plus hyperthermic intraperitoneal chemotherapy (HIPEC), both scoring models lack some anatomic information thus making staging laborious and unreliable. The PCI 2-D model lacks depth, the anatomic structures contained in a specific region overlaps and similar limitations apply to the CC-S because it completely lacks an anatomic model and therefore gives no information on the sites of residual disease or their number. Maintaining Sugarbaker's original concepts, we therefore developed a computerized digital tool including a new 3-D effect anatomic scheme for calculating PCI and CC-S corresponding closely to the patients' real anatomy. Our new anatomic model belongs in a web-based application named PSM staging system containing the essential clinical and pathological data for the various PSMs currently treated.

The new digital tool for staging PSM runs on a PC or tablet and comprises male and female coloured 3D anatomic models for the 13 endoabdominal regions with borders defined according to real anatomic landmarks. A drag-and-drop tool allows users to compute PCI and CC-S making it easier to localize and quantify with greater precision the extent of peritoneal disease in diagnostic and surgical settings as well as residual disease after CRS.

Once tested by registered users online our computerized application should provide a modern, shareable, comprehensive, user-friendly PSM staging system. Its anatomic features along with the drag-and-drop tool promise to make it easier to compare preoperative and postoperative PCIs thus improving the criteria for selecting patients to undergo CRS plus HIPEC. By specifying as well as the size the site and number of