ablation than RFA. Histopathological examination of microwave ablated tissue has identified an area of ultrastructurally normal but non-viable tissue within the ablation zone. It has been suggested that this tissue may have undergone a novel type of microwave cell death caused by protein cross-linking. This study aimed to characterize the relationship between ablation time, applied power and size of ablation produced by a novel high-frequency 14.5 GHz microwave applicator in ex vivo human hepatic parenchyma and colorectal liver metastases, and investigate the mechanism of microwave cell death.
Material and Methods: Multiple ablations were performed in 8 ex vivo human hepatic resections and colorectal liver metastases at a variety of time (10–180 seconds) and power (10−50 watt) settings. Histological, enzyme histochemical and transmission electron microscopic analysis was performed, as well as preliminary proteomic analysis using 2-D SDS-PAGE.
Results: Increasing time and power settings led to a predictable and reproducible increase in size of ablation. At 50 watts and 180 seconds application, a maximum ablation diameter of 38.8 mm (±1.3) was produced. Ablations were produced rapidly, and at all time and power settings ablations remained spherical (longest:shortest diameter <1.2). Routine histological analysis using H&E confirmed well preserved cellular ultrastructure after ablation. Transmission electron microscopy demonstrated marked subcellular damage. Enzyme histochemical showed complete absence of viability in ablated tissue. 2-D gel electrophoresis showed no difference in protein expression between ablated and non-ablated tissue, irrespective of reducing or non-reducing conditions, suggesting consistent cross-linking is unlikely.
Conclusions: Large spherical ablation zones can be rapidly and reproducibly achieved in ex vivo human hepatic parenchyma and colorectal liver metastases using a 14.5 Ghz microwave generator. Despite well preserved cellular ultrastructure, ablated tissue is non-viable. Consistent cross-linking of proteins does not occur following ablation.

2503 POSTER

Immediate Breast Reconstruction of Segmentectomy Defects Using Extended Lattisimus Dorsi Flap via Single Axillary Incision

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Background: Aim of this study is to describe the technique of extended autologous latissimus dorsi flap to reconstruct segmentectomy defects via single axillary incision; and to assess the outcomes of this procedure.
Methods: Between December 2008 and December 2009, 20 patients with early breast carcinoma, underwent extended latissimus dorsi flap for reconstruction of segmentectomy defects (reaching about 20−3-% of breast volume). Measured outcomes included: surgical complications, cosmetic outcome, and functional disability.
Results: Acceptable results were noticed with this technique as regard: postoperative complications (4 patients) with no further surgical intervention, sensory loss (nipple-areola complex; 2 patients, quadrant; 8 patients), restricted activities in 2 patients. Considering aesthetic evaluation, very much acceptable results were noticed as regard panel assessment and patient satisfaction.
Conclusion: This technique is associated with few adverse surgical and physical sequalae, without compromising cosmetic outcome, representing good alternative to mastectomy (if similar), avoiding additional scars and use of prosthesis.

2504 POSTER

Oncoplastic S-shaped or Reverse S-shaped Rotation Flap Reconstruction After Quadrantectomy as a New Option for Lower Half Located Breast Cancer − a Technical Report

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Background: When performing breast conserving operations, inferior cosmetic outcome has been reported in lower half breast tumours. We report here about the use of S-shaped or reverse S-shaped rotation flap reconstruction to improve cosmetic outcome in patients with lower half-located breast cancer.
Patients and Methods: Twenty three patients with invasive breast cancer located in the lower half of the breasts, which were more than two centimeter apart from the nipple, were included. After completing quadrantectomy, single S-shaped or reverse S-shaped incision was made from axilla to breast including two triangular skin islands on axilla and breast. Once the fibroglandular tissues and the additional fatty tissue of the flank were appropriately mobilized, the breast defect was closed at the mid-point of the parenchymal thickness in order to keep the natural position of the inframammary fold.
Results: Median tumour size was 2.3 cm, ranging from 0.7 to 3.5 cm. With a median follow up of 18.5 months, ranging from 3 to 27.5 months, cosmetic outcome were good (91.3%) to fair (8.7%) after the radiation therapy and there was no local or systemic recurrence.
Conclusion: Clearly, this type of rotation flap reconstruction is an oncologically safe and a cosmetically sound procedure. Hopefully this rotation flap reconstruction will become more widely available and perhaps a standard procedure for lower half located breast tumours, especially in the small to medium sized breasts.

2505 POSTER

Towards More Efficacy in HIPEC − Optimization of Fluid Mechanics

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Background: ‘HIPEC’ (Hyperthermic IntraPeritoneal Chemotherapy) is a loco-regional treatment and was first described by Spratt in 1980 [1]. He described the procedure in the closed method and it took him 1.5 hours to reach intraperitoneal 42ºC before he started the chemoperfusion. But little is known about fluid mechanics and its influence on the procedure until today. As a new HIPEC-center in Germany we have developed special interest in fluid mechanics during the procedure.
We started using placement of catheters for HIPEC as described by many authors (e.g. Roviello [2], Dahlke [3]) with inflow in the right upper quadrant and deep pelvis and outflow in the high pelvis and left subphrenic space or paracolic gutters. In contrast to the widely used technique we placed our temperature probes far away from the catheters. The results were disappointing! So we modified our HIPEC protocol step by step.
Material and Method: HIPEC was performed using the equipment of RanD (Performer LRT − 1 procedure and Performer HT all other procedures) together with the perfusion sets consisting of a set of catheters for in- and outflow with 2 catheters for inflow and 3 catheters for outflow. 2 temperature probes are integrated and 3 probes can be used separately from the catheters.
We modified the equipment by introducing a third catheter for inflow. In a second step we introduced polyurethane sponges and wrapped 2 outflow catheters to increase the surface and to open up recessus and spaces around the liver and in the left upper quadrant. We could demonstrate in a very small patient population (11 procedures; 3 without modification and 8 with our modification) the efficacy of this approach by measuring the temperature far away from the catheters.
Results: The homogenicity of distribution of the heated chemoperfusate highly improved as demonstrated by the temperature values.
An additional beneficial effect on the turnover of the chemoperfusate was noticed resulting in increased flow rates up to 1500 ml/min with only minor variations. With this high turnover it seems possible to overcome the intra-abdominal cooling effects of the well-perfused organs like the liver or great vessels. It is also possible to shorten the ‘warming-up’ period from 1.5.hours (Spratt?) to only 10−15 min.
Conclusions: With our modified placement of the in- and outflow catheters combined with using perfused spacers of polyurethane-sponges we could significantly increase the flow rate/turnover of the chemoperfusate, abbreviate the warming-up phase of the procedure and demonstrate a more homogenous distribution of heat and chemoperfusate.
Outlook: Further investigations are necessary to study the intra-abdominal processes and fluid mechanics during HIPEC procedures in order to increase efficacy to control peritoneal surface malignancies. The next step will be to evaluate the design and the placement of the catheters and to develop fluid dynamic models of the HIPEC-procedure to overcome preferential flow and cooling effects of large organs and vessels.

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