Surgical Research in Switzerland

Annals of Surgery

One Hour Hypothermic Oxygenated Perfusion (HOPE) Protects Nonviable Liver Allografts Donated After Cardiac Death

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Background: To test, in a large animal model, the efficacy of machine perfusion to rescue livers after prolonged ischemic injury. Our group previously showed in various rodent models the benefit of endischemic hypothermic oxygenated perfusion (HOPE) in protecting liver injury from donation after cardiac death (DCD). Convincing results are needed in large animal models before application in human.

Methods: A new model of DCD liver transplantation in large pigs was developed. Pig livers (1300 +/- 210 g each) were harvested 60 minutes after induction of cardiac death (respirator withdrawal). In situ flush and organ procurement were initiated without heparin pretreatment. Then, livers were preserved for 7 hours in cold Celsior (DCD-group) prior to orthotopic transplantation (OLT). Some livers were treated by 1 hour HOPE prior to implantation (HOPE-group). In a first step, animals were kept under anesthesia for 6 hours after orthotopic transplantation. Endpoints included serum (AST) and tissue (ATP, glutathione) markers of injury, bile flow, and histology. In a second step, survival experiments were performed.

Results: Livers from the DCD group displayed diffuse necrosis of hepatocytes, increased adhesion of platelets, high AST release, absence of bile flow, depletion of glutathione, and ATP. In contrast, livers treated with HOPE showed dramatic reduction of necrosis, platelet adhesion, while bile flow, ATP recovery and glutathione were improved. Importantly, untreated DCD livers caused graft failure and death of all recipients within 6 hours of reperfusion, whereas HOPE treated DCD livers remained hemodynamically stable.

Conclusions: This is the first study in a reliable large animal transplant model demonstrating the efficacy of a simple cold oxygenated machine perfusion system to rescue, otherwise lethal, ischemic injured DCD liver grafts.

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Long-term follow-up after complete resection of well-differentiated cancer confined to the thyroid gland

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Background: Papillary or follicular thyroid carcinomas exhibit a relatively benign course. Hence, long-term follow-up studies with well-defined disease stages and treatment details are needed to evaluate treatment strategies.

Methods: Patients who underwent complete resection of well-differentiated thyroid carcinoma (WDTC) confined to the thyroid gland between 1972 and 1990 identified from a prospective database were assessed. Follow-up was performed by interview, review of patient charts, and analysis of the Death Registry. Primary endpoints were overall survival (OS) and disease-specific survival (DSS). Review of histology was performed and extent of thyroid resection, postoperative therapy, and recognized prognostic factors but not lymphadenectomy were evaluated.

Results: Of 2,867 patients, 213 had complete resection of WDTC confined to the thyroid gland. Follow-up was completed in 166 patients with median age 54.2 (range, 20-85) years, and median follow-up of 27.2 (range, 15.6-34.5) years. The 10- and 20-year OS was 71 and 55%, respectively. DSS at 10 and 20 years was 81 and 69%, respectively, and correlated with age, histology, tumor size, radio-iodide ablation (RIA), and external beam irradiation (EBR) treatment. No patient died of WDTC more than 18 years after resection. Total or near-total thyroidectomy without lymphadenectomy was not superior to partial thyroidectomy. In multivariate analysis for DSS, age was the dominant factor, which correlated with histology.

Conclusions: After a median follow-up of 27 years, about one-third of patients died of WDTC. Age, histology and postoperative therapy but not extent of thyroid resection determined DSS.

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The impact of stereo-visualisation of three-dimensional CT datasets on the inter- and intraobserver reliability of the AO/OTA and Neer classifications in the assessment of fractures of the proximal humerus

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We evaluated the impact of stereo-visualisation of three-dimensional volume-rendering CT datasets on the inter- and intraobserver reliability assessed by kappa values on the AO/OTA and Neer classifications in the assessment of proximal humeral fractures. Four independent observers classified 40 fractures according to the AO/OTA and Neer classifications using plain radiographs, two-dimensional CT scans and with stereo-visualised three-dimensional volume-rendering reconstructions. Both classification systems showed moderate interobserver reliability with plain radiographs and two-dimensional CT scans. Three-dimensional volume-rendered CT scans improved the interobserver reliability of both systems to good. Intraobserver reliability was moderate for both classifications when assessed by plain radiographs. Stereo visualisation of three-dimensional volume rendering improved intraobserver reliability to good for the AO/OTA method and to excellent for the Neer classification. These data support our opinion that stereo visualisation of three-dimensional volume-rendering datasets is of value when analysing and classifying complex fractures of the proximal humerus.

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