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Abstracts' Service

Single Running Suture Technique is Associated with Low Rate of Bronchial Complications after Lung Transplantation

Thomas Schweiger, Ioannis Nenekidis, Jakob Elias Stadler, Stefan Schwarz, Alberto Benazzo, Peter Jaksch, Konrad Hoetzenecker, Walter Klepetko, Vienna Lung Transplant Program

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Background. Lung transplantation has evolved to a routinely performed surgical procedure in patients with end-stage pulmonary disease. Bronchial healing problems are rare but represent a potential life-threatening complication. Herein, we aimed to define the incidence, classification, and treatment of bronchial complications after lung transplantation.

Material and methods. All patients receiving lung transplantation between January 1999 and December 2017 were included in this retrospective study. All bronchial anastomoses were performed in a standardized technique using a single, polydioxanone running suture. The rate of anastomotic complications requiring an intervention, type of complication according the 2018 International Society for Heart and Lung Transplantation classification, and the clinical management were retrospectively analyzed.

Results. A total of 2941 anastomoses were performed in 1555 patients. The overall incidence of relevant anastomotic complications was 1.56%, 0.68% for left anastomoses, and 2.44% for right anastomoses. In 6 patients, a surgical revision or retransplantation was performed, whereas endoscopic treatment alone was sufficient in 39 patients. One patient underwent right-sided retransplantation 6 months after the first lung transplantation after failed endoscopic treatment attempts. International Society for Heart and Lung Transplantation grade "S Lc Ec" was the most common type of anastomotic complication. The overall incidence decreased within the study period from 2.4% in the era 1999 to 2003 to 0.8% in the era 2014 to 2017. We found no significant difference in overall survival of patients with and without anastomotic complications (P = 0.995; hazard ratio, 0.99; 95% confidence interval, 0.63-1.58).

Conclusions. The single running suture technique is associated with a very low rate of true anastomotic complications. Close follow-up and early endoscopic treatment of patients with anastomotic complications result in excellent long-term outcomes.

Routine Surveillance for Diagnosis of Venous Thromboembolism After Pleurectomy For Malignant Pleural Mesothelioma

Luis E De León, Carlos E Bravo-Iñiguez, Sam Fox, Jeffrey Tarascio, Samuel Freyaldenhoven, Moshe Lapidot, Michael T Jaklitsch, Raphael Bueno

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Objective. The purpose of this study was to determine the incidence of venous thromboembolism and utility of a routine surveillance program in patients undergoing surgery for mesothelioma.

Methods. Patients undergoing pleurectomy from May 2016 to August 2018 were included. A standardized surveillance program to look for venous thromboembolism in this group included noninvasive studies every 7 days postoperatively or earlier if symptomatic. All patients received external pneumatic compression sleeves in addition to prophylactic heparin. If deep vein thrombosis or pulmonary embolus was discovered, heparin drip was initiated until conversion to therapeutic anticoagulation.

Results. A total of 100 patients underwent pleurectomy for mesothelioma. Seven patients were found to have preoperative deep vein thrombosis, and as such only 93 patients were included for analysis. The median age of patients at surgery was 71 years (30-85 years). During the study, 30 patients (32%) developed evidence of thrombosis; 20 patients (22%) developed only deep vein thrombosis without embolism, 3 patients (3%) developed only pulmonary embolism, and 7 patients (7%) developed both deep vein thrombosis and pulmonary embolus. Of the 27 patients who developed deep vein thrombosis, 9 (33%) were asymptomatic at

the time of diagnosis, and none of these developed a pulmonary embolus or other bleeding complications. There were 2 (2%) events of major postoperative bleeding related to therapeutic anticoagulation.

Conclusions. The incidence of venous thromboembolism is high (32%) among patients undergoing surveillance after pleurectomy for mesothelioma. Up to 33% of patients with deep vein thrombosis are asymptomatic at the time of diagnosis, and the incidence of complications related to anticoagulation is low. Routine surveillance may be useful to diagnose and treat deep vein thrombosis before it progresses to symptomatic or fatal pulmonary embolus.

Quantitative Assessment of Technical Performance During Hands-on Surgical Training of The Arterial Switch Operation Using 3-Dimensional Printed Heart Models

Nabil Hussein, Osami Honjo, Christoph Haller, John G Coles, Zhongdong Hua, Glen Van Arsdell, Shi-Joon Yoo

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Objective. Data supporting the use of hands-on simulation in congenital heart surgery are promising but primarily qualitative. This study aimed to demonstrate if there was an objective improvement in time and technical performance of the arterial switch procedure on 3-dimensional printed heart models by surgeons using a validated assessment method.

Methods. A total of 30 surgeons of varying experience performed the arterial switch procedure twice on 3-dimensional printed models with transposition of the great arteries during the Hands-on Surgical Training courses. Surgeons' performances were recorded and retrospectively assessed for both time and performance using the Hands-on Surgical Training-Congenital Heart Surgery tool, a validated procedure-specific assessment tool for the arterial switch.

Results. A total of 60 videos were scored. Eighty percent of surgeons (24/30) had improved from their first attempt. The mean total score of the first attempt performance compared with the second was 103 and 120, respectively, with a mean difference in score of 17 (95% confidence interval, 10-24). All surgeons were statistically significantly quicker in their second attempt. The mean time for the first attempt compared with the second was 1 hour, 28 minutes, 4 seconds and 1 hour, 5 minutes, and 45 seconds, respectively, with a mean difference of 0 hours, 22 minutes, 19 seconds (95% confidence interval, 0 hours, 15 minutes, 22 seconds to 0 hours, 25 minutes, 34 seconds).

Conclusions. This is the first study to demonstrate an objective improvement in time and technical performance of the arterial switch procedure on 3-dimensional printed heart models. This supports the evidence that simulation in the form of deliberate practice with constructive, objective feedback is fundamental in the training of future congenital heart surgeons. These simulations and assessments should be incorporated to create structured, standardized training curricula within congenital heart surgery.

Low Dose of ^{31I}-F(ab')$_2$-Rituximab and ^{131}I-Rituximab Induces G1arrest and Apoptosis in Raji Cells (Burkitt's Lymphoma)

Shishu Kant Suman, Mythili Kameswaran and Ashutosh Dash

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Radiolabeled fragmented F(ab')$_2$ antibodies had shown better therapeutic efficacy than radiolabeled intact antibodies in treating cancers. In this study, we investigated the differences and similarities on the mechanism and extent of cell death in Raji cells (Burkitt's lymphoma) in response to 370 kBq of ^{131}I-F(ab')$_2$-Rituximab and ^{131}I-Rituximab up to 72 h. F(ab')$_2$ of Rituximab was prepared and characterized by SE-HPLC and SDS-PAGE. Fragmented and intact Rituximab were radioiodinated by Chloramine-T method. Toxicity and mechanism of cell death in Raji cells in response to ^{131}I-F(ab')$_2$-Rituximab and ^{131}I-Rituximab were studied by MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide), LDH (lactate

dehydrogenase), trypan blue exclusion, viability, apoptotic, caspase assays and cell cycle analysis. The cytotoxicity assays showed slow death of Raji cells up to 24 h in response to both ^{131}I-F(ab′)$_2$-Rituximab and ^{131}I-Rituximab. Cell cycle analysis at 30 h showed G1 arrest in Raji cells which led to its slow cell death up to 24 h. Elucidative assays to identify the molecular mechanism of death of G1arrested Raji cells showed apoptotic cell death at 40 h after treatment, which was validated by demonstrating caspase activation in arrested Raji cells. Toxicity studies and mechanism of cell death in Raji cells demonstrated comparable results when treated with equivalent doses (370 kBq) of radiolabeled antibodies indicating ^{131}I-F(ab′)$_2$-Rituximab as a potential radioimmunotherapeutic agent for patients with Non-Hodgkin's lymphoma.