CONTROVERSES ET ACTUALITES EN CHIRURGIE VASCULAIRE CONTROVERSIES & UPDATES IN VASCULAR SURGERY JANUARY 23-25 2020

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How I manage thoracic tumors incorporating the supra aortic trunks *Elie FADEL*







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Disclosure

Speaker name: Elie FADEL

I do not have any potential conflict of interest

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Thoracic tumors that may invade the SAT requiring surgical resection



From the Lung:

NSCLC: Upper lobes +++ Metastasis to the upper lobes

From the mediastinum:

Thymoma

Primary Mediastinal germ cell tumors Sarcoma / Pseudoinflammatory tumors



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Surgical challenges due to the SAT invasion

Surgical approach:

- Combined cervicothoracic approach
- Vessels control and replacement
- Enbloc resection of the tumor and the involved vessels

SAT-cross clamping:

- Should be as short as possible
- As tumor resection time may be long (complexity of the procedure) all the other involved structures should be resected first and the specimen pedicled around the involved vessel
- If the vessel is a carotid artery, think about shunting

SAT replacement:

- Always necessary because the collateral network is ligated
- Most of the time end to end anastomosis (rib resection / short vessel length)
- Avoid synthetic graft when potentially contamineted operative field
- Think about postoperative radiation therapy (vein/pericardial patch...)
- Protective pedicled flap

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Preoperative workup

•Evaluation of the tumor

•Histological confirmation obtained +++
•Local tumor spread: Neck and chest angio CT, flexible bronchoscopy, EBUS, duplex scanning, angiography and phlebography, MRI (spine+++)
•Distant tumor spread: PET scan, cerebral MRI or CT

•Evaluation of the patient's functional status

- •Standard laboratory and respiratory functional tests
- •Ventilation/perfusion scanning
- •VO2 max
- •Echocardiography
- •Coronary angiography
- •Right heart catheterization





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Contra-indication to surgery

•Predictive inability to achieve complete resection

cN2,N3 disease Distant metastasis

•Severe co-morbidities jeopardizing survival



Procedures should be performed only with curative intent according to the well-established principles of oncologic surgery (en-bloc surgery with microscopically tumor-free margins)

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The multimodal treatment of locally extended thoracic tumors







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Surgical approaches

Mediastinal Tumors \rightarrow Cervico-sternotomy









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The Superior Sulcus



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The anterior cervicothoracic approach (Dartevelle et al JTCVS1993)





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Transmanubrial Transclavicular Manubrium and clavicle lifted Omohyoid Anterior scalene muscle muscle divided Subclavian artery Subclavian vein Tumor Costo clavicular space



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under **CPB**



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Mediastinal Tumors





Mostly invade the venous trunks





22 23 24 **25** 26 27 28 29 **30** 31 32 33 3



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Mediastinal tumors

Contraindications to surgery

- Involvement of both phrenic nerves
- Involvement of both innominate vein confluences









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Germ cell tumor



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85%

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Subclavian artery resection and reconstruction for thoracic inlet cancers

Elie Fadel, MD, Alain Chapelier, MD, PHD, Emile Bacha, MD, Francois Leroy-Ladurie, MD, Jacques Cerrina, MD, Paolo Macchiarini, MD, PHD, and Philippe Dartevelle, MD, Le Plessis Robinson, France, and Boston, Mass

J Vasc Surg 1999;29:581-8.



Table II. Results of preoperative studies in predicting subclavian artery involvement with tumor

Preoperative test	No. of patients	No. of arteries involved	Sensitivity (%)
Arteriography	34	20	59
Duplex scanning	34	5	15
CT scanning	34	28	82
MRI	23	19	83

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Subclavian Artery Resection and Reconstruction for Thoracic Inlet Cancer: 25 Years of Experience

Benoit Lahon, MD, Olaf Mercier, MD, PhD, Elie Fadel, MD, PhD, Sacha Mussot, MD, Dominique Fabre, MD, Sarah Hamdi, MD, Thierry Le Chevalier, MD, and Philippe Dartevelle, MD

Department of Thoracic and Vascular Surgery and Heart-Lung Transplantation, Thoracic Oncology Institute, Marie Lannelongue Hospital, Le Plessis Robinson, France

Synovial sarcoma

Malignant schwannoma

Ann Thorac Surg 2013;96:983–9

1 (1%)

1 (1%)

Inlet Syndrome and Subclavian Artery Involvement			
Pathology	Number of Patients		
Carcinomas	62 (86%)		
Non-small cell lung cancer	59 (82%)		
Breast carcinoma	2 (3%)		
Thyroid carcinoma	1 (1%)		
Sarcomas	10 (14%)		
Solitary fibrous tumors of the pleura	3 (5%)		
Hemangioendothelioma	2 (3%)		
Undifferentiated sarcoma	2 (3%)		
Ewing's sarcoma	1 (1%)		





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Outcomes After Resection of T4 Non-Small Cell Lung Cancer Using Cardiopulmonary Bypass

Nathaniel B. Langer, MD, Olaf Mercier, MD, PhD, Dominique Fabre, MD, PhD, James Lawton, MD, Sacha Mussot, MD, Philippe Dartevelle, MD, and Elie Fadel, MD, PhD

Department of Thoracic and Vascular Surgery and Heart-Lung Transplantation, Marie Lannelongue Hospital and University Paris-Sud, Le Plessis Robinson, France

Use of Cell saver and CPB?

Ann Thorac Surg 2016;102:902–10



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Results of Primary Surgery With T4 Non–Small Cell Lung Cancer During a 25-Year Period in a Single Center: The Benefit is Worth the Risk

Bedrettin Yıldızeli, MD, Philippe G. Dartevelle, MD, Elie Fadel, MD, Sacha Mussot, MD, and Alain Chapelier, MD

Ann Thorac Surg 2008;86:1065-75

Survival curves of patients with and without subclavian arterial invasion



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Radiation induced sarcoma





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The contribution of reconstructive surgery: tight free flap



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Journal of Plastic, Reconstructive & Aesthetic Surgery Volume 66, Issue 6, June 2013, Pages 855-858



Case report

Cervicothoracic reconstruction with an anteromedial thigh flap: A novel flap concept *

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Conclusions

- Surgical resection of locally extended thoracic tumors to the supraortic trunks is feasible with good longterm outcome provided:
 - Extended preoperative workup ruling out surgical contraindications: distant metastasis, inabitity to R0 resection, functional compromise (phrenic nerves...)
 - Respect of oncological principles: enbloc resection with R0 margins
 - Vascular reconstruction with the shortest clamping time
- These demanding procedures should be performed by skilled team in thoracic and vascular surgeries