Thymoma 2.0

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Surgery Grand Rounds
SUNY Downstate
Thymoma 2.0
Advanced Resection, Reconstruction, Myasthenia, Phrenic Nerve and the Future
60M referred for resection of thymoma
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Nigeria, March 2013

Face and neck swelling

Travel to New York
60M referred for resection of thymoma

CT April 2013:

5.8cm mass invading SVC & Lt Brachiocephalic
60M referred for resection of thymoma

Biopsy: B1 thymoma

Masaoka stage 3, s/p 3 cycles of chemo

Transfer of care to KCHC
Chest Clinic:

Facial and upper extremity swelling

PE: normal

PMH/PSH: hyperlipidemia
Open both Pleura

In OR

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Thyroid gland

Right common carotid artery & vagus nerve

Left internal jugular vein

Thoracic duct

Left subclavian artery & vein

Left phrenic nerve & pericardial vessels

Right phrenic nerve & pericardial vessels
Right superior pole of thymus gland

Right brachiocephalic vein
Obliteration of vascular plane
Obliteration of vascular plane

Tumor Filled
Obliteration of vascular plane

Tumor FILLED

Tumor into strap muscles
Key Steps

Wedge resection of RUL

Left Innominate vein

Extensive collaterals

Phrenic nerves spared
Wire sutures approximating halves of sternum

Closure of periosteum with continuous sutures

Closure of subcutaneous tissue with interrupted sutures

Closure of skin with subcuticular sutures
Post-op course

**Extubated** in OR

Therapeutic **anticoagulation** started

Afib- Beta blocker initiated

Normal postoperative course
Pathology:

T3N1Mx
Masaoka 3
Capsule invasion
Histology type B2
Thymoma 2.0

Advanced Resection, Myesthenia, Phrenic Nerve
Myasthenia Gravis
Causes, Symptoms and Treatments
Myasthenia Gravis
Causes, Symptoms and Treatments

- Ocular
- Bulbar
- Limb
- Respiratory
AcHr-Ab
Musk-ab
80-94% +
EMG
60-70% have thymic hyperplasia

10% have thymoma
Microenvironment

Myoid cells (AcHr)

Unfolded AcHr

Prime helper T-cells
Minimally Invasive Thymectomy
Results of transcervical thymectomy for myasthenia gravis in 100 consecutive patients

Calhoun et al.
Annals of Surgery, 1999

Non-thymomatous, MG
Is thymectomy in non-thymomatous myasthenia gravis of any benefit?

Diaz et al.

*Interactive Cardiovascular and Thoracic Surgery, 2013*
Thymectomy Trial in Non-Thymomatous Myasthenia Gravis Patients Receiving Prednisone Therapy

This study is ongoing, but not recruiting participants.

Sponsor:
University of Alabama at Birmingham

Collaborator:
National Institute of Neurological Disorders and Stroke (NINDS)

Information provided by (Responsible Party):
University of Alabama at Birmingham

ClinicalTrials.gov Identifier:
NCT00294658

First received: February 21, 2006
Last updated: December 10, 2013
Last verified: December 2013

History of Changes
Phrenic Nerve Resection

~7% require unilateral resection

Most common phrenic palsy – slush?

50% are asymptomatic (Thoracic Clinics)

Paradoxical motion
Is sacrificing the phrenic nerve during thymoma resection worthwhile?

Hamdi, et al.  
*Euro J of Cardio-Thoracic*

Post-op:

*Morbidity and Mortality*- No difference

*Recurrence*- 39.5 vs 19.5% \(p=0.02\)

*Survival*- 85 vs. 88 \(p=0.6\)
Survival

5-year survival
- Spared PN: 85%
- Resected PN: 88%

10-year survival
- Spared PN: 74.8%
- Resected PN: 88%

$P = 0.60$
Does the Patient Have a Palsy?

Vital capacity standing and supine

Sniff test

Lifestyle

MG patient?
Goal of Plication

Paradoxical motion

Fixed structure
Pericardia

Resection
SVC Syndrome / Vascular Resection
William Hunter (Brother of John)
1757
TB and Syphilus
95% malignant
Benign increasing
SVC Syndrome / Vascular Resection

First Line: chemo / RT
Temporize with stent

Benign or tumor resection

open reconstruction
Collateral circulation

azygos

internal thoracic

vertebral

external thoracic
Symptoms

laryngeal edema

brain edema

flushing swelling
When **not** to Reconstruct

Both brachiocephalic veins occluded

Stage III or IV (azygos occluded)

Competitive flow

Jugular or axillary bypass

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Intraoperative Tips

High flow line below the diaphragm

Arterial line

Cerebral oximeter

Venous pressure transducer
Arterial – Venous Gradient

Clamp SVC → Increased SVC Pressure
Arterial – Venous Gradient

Saturation Jugular Venous O2 (>50%)

$\text{SaO2} - \text{SjvO2} = \text{cerebral consumption}$

(familiar…)

Recommend: MAP of 60 + Jugular Pressure

Steroids

Hyperventilation to decr. Vol.

Levo or epi
Clamping Limits

35 minutes

<50% diameter
18-20 mm graft

12-14 mm graft
...... Pitfalls and Post-op Care

Over *dissection* (kink)

Thrombosis (anticoagulate by POD 1)

Patency: ~ 23 months
What if I can’t get it all out??

10 year survival for R0 – 75%

R1 & 2 – 39%

Bx – 33%

Only way is to try, subtotal better in the end.
Thank you!
Arterial – Venous Gradient

Ohm’s Law: $I = \frac{V}{R}$ or Flow = $\frac{\Delta P}{R}$

$R$ is more complex….

MAP – CVP is $\Delta P$