AORTIC DISSECTIONS
Current Management

TOMAS D. MARTIN, MD, LAT
Professor, TCV Surgery
Director UF Health Aortic Disease Center
University of Florida
DISCLOSURES

• Terumo
• Medtronic
• Cook
• Edwards
• Cryolife
AORTIC DISSECTIONS

ETIOLOGY

MEDIAL DEGENERATIVE DISEASE

GENETIC (MARFANS)

HYPERTENSION

ASSOCIATED PATHOLOGY
  (AORTIC STENOSIS, COARCTATION)

PREGNANCY

IATROGENIC (CATH, CANNULATION, CROSS-CLAMP)

COCAINE
AORTIC DISSECTIONS

PRESENTATION

SEVERE CHEST / BACK PAIN ( TEARING )
SYNCOPE / COLLAPSE
TIA / STROKE
PARALYSIS
PULSE / PRESSURE DIFFERENTIAL
MURMUR
AORTIC DISSECTIONS

PRESENTATION

RIPPING, TEARING, 12/10 CHEST PAIN

AGE ... 50 – 65 YEARS

SEX ... 3 : 1 MALE : FEMALE

RACE ... BLACK > WHITE > ASIAN
AORTIC DISSECTIONS

DIAGNOSIS

- CHEST X-RAY
- ECHOCARDIOGRAPHY
- CT SCAN
- MRI
- AORTOGRAPHY
- IVUS
CHEST X-RAY
ECHOCARDIOGRAPHY
INTRAVASCULAR ULTRASOUND - IVUS
AORTOGRAHY
GOLD STANDARD OF THE PAST
CT SCAN

GOLD STANDARD OF TODAY
CT SCAN
GOLD STANDARD OF TODAY
CT SCAN

3D RECONSTRUCTION
AORTIC DISSECTION CLASSIFICATION

DEBAKEY

TYPE I  TYPE II

DEBAKEY

TYPE III

Stanford A

Stanford B
Classification Schemes

Classification Methods

Aortic Segment Involvement
- Type 1,2,A: Ascending aorta involvement
- Type 3,B: Ascending not involved

Duration from Clinical Onset
- Acute: Within first 14 days
- SubAcute: Between 14 days and 3 months
- Chronic: Greater than 3 months

Complications (yes/no)
- Uncomplicated
- Complicated
ACUTE AORTIC DISSECTION

NATURAL HISTORY

ASCENDING INVOLVEMENT

MORTALITY

1st 24 Hours – 33%

48 Hours -- 45%

(1% per hour)

14 Days – 48%

30 Days - 52%
ACUTE AORTIC DISSECTION
TREATMENT

ASCENDING AORTIC INVOLVEMENT
(DEBAKEY I, II/STANFORD A)

SURGICAL EMERGENCY
DEBAKEY I, II / STANFORD A
CAUSE OF DEATH

RUPTURE / TAMPONADE

CORONARY ISCHEMIA / MI

ACUTE AORTIC INSUFFICIENCY

CHF / ARRYTHMIA
ACUTE AORTIC DISSECTION
MEDICAL MANAGEMENT

TYPE B

MORTALITY

1st 24 Hours – 3%

48 Hour – 5%

14 Days – 8%

30 Days – 9%
Clinical Complications related to dissection

- Rupture
- Branch vessel malperfusion (cerebral, spinal, visceral, renal, lower extremity)
- Progression of aortic involvement with proximal or distal extension

Other:
- Uncontrollable hypertension
- Uncontrollable symptoms
- Rapid false lumen dilation
- Trans-aortic enlargement of > 10mm within the first 2 weeks
SURGICAL TREATMENT
(DISSECTIONS)

➢ “ALL” ACUTE TYPE I OR II /A
➢ TYPE III/B LEAK OR RUPTURE
➢ COMPROMISE OF VISCERAL OR PERIPHERAL VESSELS, i.e., MALPERFUSION
ASCENDING DISSECTION

PREOP SURGICAL CONSIDERATIONS

- ANESTHESIA / ANESTHESIOLOGIST
- CANNULATION / PERFUSION
- VALVULAR INVOLVEMENT
- CORONARY ARTERY DISEASE / ISCHEMIA
- PERIPHERAL OR VISCERAL ISCHEMIA
ASCENDING DISSECTION
PREOP ANESTHESIA CONSIDERATIONS

HEMODYNAMIC INSTABILITY

TAMPONADE PHYSIOLOGY

SURGEON IN THE ROOM
DURING INDUCTION
ASCENDING DISSECTION
ANESTHESIA MONITORING
CONSIDERATIONS

TRANSESOPHAGEAL ECHO (TEE)

SWAN GANZ PULMONARY ARTERY CATHETER
ASCENDING DISSECTION
CANNULATION OPTIONS

FEMORAL
AXILLARY
ASCENDING AORTA
LEFT VENTRICULAR APEX
ASCENDING DISSECTION
CEREBRAL PROTECTION

- PROFOUND HYPOTHERMIA
- ANTEGRADE PERFUSION
- RETROGRADE PERFUSION
- PHARMACOLOGIC PROTECTION
ASCENDING DISSECTION

BASIC INTRAOPERATIVE GOALS

RELIEF OF TAMPONADE

ALLEVIATION OF ISCHEMIA

RESECTION – ASCENDING / PROXIMAL ARCH

AORTIC VALVE SALVAGE
ASCENDING DISSECTION
INTRAOPERATIVE TECHNIQUES

➢ FELT ?
➢ GLUE ?
➢ BOTH ?
ACUTE ASCENDING DISSECTION

SPECIAL CONSIDERATION

AORTIC VALVE MANAGEMENT

VALVE RESUSPENSION

ROOT REPLACEMENT

VALVE REPLACEMENT

VALVE SALVAGE
AORTIC VALVE SALVAGE

DAVID 1

FLORIDA SLEEVE
ACUTE AORTIC DISSECTION
MANAGEMENT OF THE ARCH

Partial Replacement vs Total Replacement
ACUTE ASCENDING DISSECTION
MORTALITY

OVERALL ... 8 - 36%

STANFORD – 24%
CLEVELAND CLINIC – 14%
MT SINAi NY – 14%
U OF FLORIDA – 16%
ACUTE AORTIC DISSECTION
DEBAKEY III / STANFORD B

CONSERVATIVE MEDICAL MANAGEMENT vs OPEN SURGICAL MANAGEMENT

vs

?? ENDOVASCULAR STENT GRAFTING ??
ACUTE DEBAKEY III DISSECTION

MEDICAL MANAGEMENT

UNCOMPLICATED DISSECTIONS

NO EVIDENCE OF LEAK OR RUPTURE

NO (ACCEPTABLE) VISCERAL ISCHEMIA

NO LIMB / LEG ISCHEMIA
ACUTE DEBAKEY III DISSECTION
MEDICAL MANAGEMENT

WHAT IS MEDICAL MANAGEMENT?

AGGRESSIVE BP CONTROL

AGGRESSIVE PAIN CONTROL

AGGRESSIVE SURVEILLANCE FOR MALPERFUSION
ACUTE DEBAKEY III DISSECTION
SURGICAL MANAGEMENT

INDICATIONS

EVIDENCE OF LEAK OR RUPTURE
SIGNIFICANT VISCERAL ISCHEMIA
CONTINUOUS OR INTERMITTENT
LEG ISCHEMIA
ACUTE AORTIC EXPANSION > 6 CM
ACUTE DEBAKEY III DISSECTION
MEDICAL VS SURGICAL TREATMENT

RESULTS

MEDICAL MORTALITY 0 – 10%

SURGICAL MORTALITY 0 – 60%

? IN HOSPITAL COMPLICATIONS,
PROCEDURES FOR ISCHEMIA, EARLY
EXPANSION REQUIRING SURGERY?
## ACUTE DEBAKEY III DISSECTION

### SURGICAL VS MEDICAL

<table>
<thead>
<tr>
<th></th>
<th>HOSPITAL MORTALITY (%)</th>
<th>1 YEAR SURVIVAL (%)</th>
<th>5 YEAR SURVIVAL (%)</th>
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<tbody>
<tr>
<td>SURGICAL</td>
<td>0</td>
<td>93</td>
<td>68</td>
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<tr>
<td>MEDICAL</td>
<td>2</td>
<td>90</td>
<td>87</td>
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ACUTE DEBAKEY III DISSECTION
SURGICAL MANAGEMENT

DESCENDING REPLACEMENT

PARTIAL

UPPER DESCENDING ONLY
EXTREMELY FRAIL
SALVAGE PROCEDURE

TOTAL

TOTAL DESCENDING
YOUNGER / HEALTHIER
ACUTE DEBAKEY III DISSECTION
INTRAOPERATIVE CONSIDERATIONS

DISTAL PERFUSION

YES

NO
ACUTE DEBAKEY III DISSECTION
INTRAOPERATIVE CONSIDERATIONS

DISTAL PERFUSION

LEFT ATRIAL TO FEMORAL ARTERY BYPASS

FEMORAL ARTERY / FEMORAL VEIN
CARDIOPULMONARY BYPASS

PASSIVE DISTAL SHUNT
(AORTA TO AORTA)
ACUTE DEBAKEY III DISSECTION

INTRAOPERATIVE CONSIDERATIONS

INTERCOSTAL REIMPLANTATION

EXTREMELY DIFFICULT - CONTRAINDICATED
ENDOVASCULAR STENT GRAFTS
A NEW ERA
Endovascular Stent Grafts
A New Era
Diagnosis...

- **Chest X-ray:**
  - Wide mediastinum, cardiomegaly, pleural effusion
- **CT Scan:**
  - Identifies intimal flap rapidly, requires contrast media, identifies rupture
- **2-D ECHO/TEE:**
  - Identifies intimal flap, no contrast media, bedside
- **Cath:**
  - Used to be “Gold Standard”
- **MRI:**
  - Highly sensitive, but takes time...
Acute Dissections

- Felt?
- Glue?
- Both?