Interactive discussion of uncomplicated Type B dissection cases in medical treatment: Case examples

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ADSORB (TAG 05-04)
European Dissection Study

Acute Dissection treatment with Stent graft OR Best medical therapy

- Randomized European study comparing endoluminal stent grafting and best medical therapy (BMT) to BMT alone in the treatment of acute uncomplicated Type B aortic dissections

- 61 subjects enrolled in this study
  - 30 stent graft and BMT
  - 31 BMT alone

Look at two(2) cases from the BMT group using literature based predictors to help identify possible patients who could benefit from early TEVAR
CASE 1: Initial Presentation

Courtesy of Professor Dittmar Böckler, University Hospital Heidelberg, Germany
Primary Entry Tear
Initial Presentation
False Lumen Measurement

Initial Presentation

Measurement at Upper Thoracic (UT) or Distal to Arch


Fusiform index (FI) = \( \frac{A}{B + C} \)

\[
42.5 \text{ mm} / (35.0+32.9) = 0.63
\]
Primary Tear Location

Initial Presentation

Can be difficult to determine outer or inner curve on Axial slices
Primary Tear Location

Initial Presentation
Primary Tear Location

Initial Presentation

Primary Tear Location

Initial Presentation

Convexity

Concavity
Vessel Considerations

Initial Presentation
Vessel Considerations

Initial Presentation
Vessel Considerations

Initial Presentation
Access Considerations

Initial Presentation
Case Planning Considerations

Initial Presentation

Illustration of Measurements

One 15 cm Device covering the LSA
Expectations based on risk predictors

• CASE 1 appears to be a “High Risk” patient based on multiple literature predictors
CASE 1: One Year follow-up
Primary Entry Tear

1 year follow-up
Primary Entry Tear

1 year follow-up

24.7 mm

(12.9 mm)
Total Aortic Diameter

1 year follow-up

43.3 mm
(40.7 mm)
False Lumen Measurement

1 year follow-up

34.3 mm
(23.5 mm)
Partial False Lumen Thrombosis

Tsai TT, Evangelista A, Nienaber CA, Myrmel T, Meinhardt G, Cooper JV et al.
Expanded False Lumen Distal Aorta

1 year follow-up

48.4 mm

57.6 mm
Vessel Considerations

1 year follow-up
Vessel Considerations

1 year follow-up
Vessel Considerations

1 year follow-up
Access Considerations

1 year follow-up
CASE 1: “Long-term” follow-up

- Total Aortic Diameter increased continuously
- TEVAR was performed @ 14 months
- 4 year follow-up showing complete false lumen thrombosis
CASE 2: Initial Presentation

Dr. Thomas Larzon, Örebro University Hospital, Sweden
Thrombosed False Lumen to LSA
Initial Presentation
Thrombosed False Lumen to LSA

P Values
Overall, 0.003
Partial thrombosis vs. patent, <0.001
Complete thrombosis vs. patent, 0.17
Partial thrombosis vs. complete thrombosis, 0.41

Mortality Rate

Days since Follow-up

L

FOV: 240.00 mm
HELIX
120 kV
448 mA
Tilt: 0.00
LAO 0: CAU 90
No: 26
Thrombosed False Lumen to LSA

P Values
- Overall, 0.003
  - Partial thrombosis vs. patent, 0.001
  - Complete thrombosis vs. patent, 0.17
- Partial thrombosis vs. complete thrombosis, 0.41

Mortality Rate vs. Days since Follow-up

- Complete thrombosis
- Partial thrombosis
- Patent

FOV: 240.00 mm
HELIX
120 kV
448 mA
Tilt: 0.00
LAO 0: CAU 90
No: 26
Initial Total Aortic Diameter

Initial Presentation

37.4 mm
Complete False Lumen Thrombosis

Initial Presentation
Total Aortic Diameter
Initial Presentation

31.7 mm
Start of Partial Thrombosis

Initial Presentation
Partial Thrombosis
Initial Presentation
Partial Thrombosis
Initial Presentation
Distal identified Entry Tear

Initial Presentation
Distal identified Entry Tear

Initial Presentation

6.08 mm
Distal identified Entry Tear

Initial Presentation

A, Cumulative survival free from sudden death and surgical/endovascular treatment by entry tear pattern (size and location).

Type IIIb Dissection

Initial Presentation
Fusiform Index

Initial Presentation


\[ \text{Fusiform index (Fl)} = \frac{A}{(B + C)} \]

Figure 1. Definition of Fl. An index that expresses the degree of fusiform dilatation of the proximal descending aorta was defined as follows: \( A/(B + C) \), \( A = \) Maximum diameter of the descending aorta, \( B = \) Diameter of the distal aortic arch, \( C = \) Diameter of the descending aorta at the level of the origin of the main pulmonary artery.

Illustration of Measurements:

\[ \frac{36.3 \text{ mm}}{34.3 + 29.3} = 0.57 \]
Case Planning Considerations

Initial Presentation

Long length coverage to include thrombosed False Lumen?
Expectations based on risk predictors

• CASE 2 is expected to be stable with BMT only
CASE 2: One year follow-up
Resolved Thrombosis

1 year follow-up
Total Aortic Diameter

1 year follow-up

32.8 mm
(37.4 mm)
Resolved Thrombosis Distal Aorta

1 year follow-up
Distal Dissection

1 year follow-up
Distal Identified Entry Tear

1 year follow-up
Distal Identified Entry Tear

1 year follow-up

10.1 mm
(6.1 mm)
Type IIIb: No Distal Extension

1 year follow-up
Stable aorta
3 year follow-up
Stable aorta

3 year follow-up
Stable dissection

3 year follow-up
CASE 2: “Long-term” follow-up

• No events after 4½ years
• BMT only
Summary of predictors

- FL diameter $\geq 22$ mm at UT: $p<0.001$ (Song 2007)
- Aortic diameter max $\geq 40$ mm: HR=3.13; $p=0.032$ (Takahashi 2008)
- Fusiform Index $\geq 0.64$: HR=2.73 (Marui 2007)
- Primary Entry Tear at inner curve: $p<0.001$ (Weiss 2011)
- Proximal Location of Entry Tear: HR=1.84 (Evangelista 2012)
- Entry Tear size $\geq 10$ mm: HR=5.8; $p<0.001$ (Evangelista 2012)
- FL Partial Thrombosis (vs. patent): $p<0.001$ (Tsai 2007)
Conclusion

• Literature based indicators/predictors may help to identify “High Risk” uncomplicated Type B dissection patients

• Can be a platform for the design of future studies were pro-active treatment can be evaluated
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