Value of Fusion Imaging To Facilitate Treatment Of Complex Aorto-Iliac Occlusions – a new horizon?

Klaus Overbeck MD MPhil

Sunderland Hybrid OR with GE Discovery 730

The answer is obviously ....

Aorto-bi-femoral graft surgery
- Cardiovascular risk patients
- Significant mortality
- Graft infections and Pseudo-aneurysms

What about endo?

Subintimal aorto-bi-iliac re- canalisation

Financial disclosure and conflict of interest

Consulting and invited speaker:
- GE Medical
- User of GE Discovery 730
- Gore Medical
Endovascular aorto-bi-femoral graft

- But brachial access in aortic occlusions is required
- Its complex, tedious and somehow uncontrolled

Plain old angiography for AI CTO

- Fluoroscopy without contrast shows only very calcified vessels
- Road mapping is 2-D and static (no AP to Lateral switching)

Where am I going?

What can fusion add?

- Make the vessels visible in 3D
- Moves in real time synchronous with the gantry
- May not need brachial access?

Concept of vascular fusion

Fusion = 3D mask fluoroscopy + 3D roadmap

Fusion is synchronized with the gantry

Distal aorto-bi-iliac occlusion

- 72 female
- Short distance claudication 20 yards
- Ex-smoker, hypertensive and diabetic
- Obese
- Short of breath on exertion

Fusion 3D centreline with GE Vision 2 workstation
Aorto-iliac sub occlusion

- 48 year old female
- 50 meter bilateral IC since 2 years
- Smoker 20/day since 15 year old
- Obese BMI 38
- Type II diabetic

Case 3 : Aorto-bi-iliac occlusion

- Manual centerline fusion using a bridge function
- Way points
  - renal arteries
  - entry and exit points
  - aortic bifurcation

Case 3 : Aorto-bi-iliac occlusion

Mask registration with DSA

Fusion guided wire passage
55 yr male with a left CIA stent and aortic occlusion treated with a left axillo-fem graft elsewhere

Presented with an infected bypass graft 2 month later

Treatment: Fusion guided right aorto-iliac stent and SFV crossover

Atrium V12 Stentgrafts

Crossing using volume with way points

Fusion guided wire passage

Flush aorto-iliac CTO

Stent deployment with renal protection balloons
Final result with superficial femoral vein cross over graft

Retrograde subintimal re-entry
- 59 yo female
- 50 yards bilateral IC
- Ex-smoker
- COPD
- Heavy calcified
  Aorto-bi-CIA CTO

No re entry

Outback LTD™ J &J catheter

Fusion guided Outback re-entry

GE Discovery 730 with Vision 2
Analysis of aorto–iliac CTO’s treated with fusion

15 consecutive TASC C and D patients

- 7 Aorta-iliac CTO with 3 flush aortic occlusions
- 22 common iliac occlusions (CIA)
- 7 bilateral CIA occlusions
- 8 full length iliac occlusions

Outcome:
- Technical success: 100%
- 13/15 retrograde 86%
- 2/15 antegrade flush aortic CTO’s 14%
- 8 luminal
- 8 subintimal
- 7 Outback re-entry in the aorta (2 bilateral) 100%

Complications:
- 1 Stent occlusion after 3 months
- 1 Limited re-entry dissection with Outback LTD

Conclusions

- Fusion may facilitate luminal retrograde crossing of complex AI occlusions
- With fusion brachial or contralateral femoral access may not be required to treat AI CTO’s safely
- Can provide precise guidance for safe and successful Outback™ assisted re-entry in the infrarenal aorta