Fusion Imaging, 3D Rotational Angiography or CO₂ for complex aortic endografting

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Pre-op MCTA







Fusion between pre-op MCTA and fluoroscopy



Spine visible on fluoroscopy



Spine from pre-op MCTA

Fusion between pre-op MCTA and fluoroscopy



Fusion between pre-op MCTA and intra-op C-arm CT



Coronal

Sagittal

Fusion between pre-op MCTA and intra-op C-arm CT



Fusion between pre-op MCTA and intra-op C-arm CT



Oblique reformatted cross-section orthogonal to the stent graft main axis







Pre-op MCTA



Fusion between intra-operative C-arm CTA and fluoroscopy



Fusion between intra-operative C-arm CTA and fluoroscopy



Limitations with current fusion imaging:

- Limited accessibility
- For complex EVAR, precision orientation is crucial. Fusion imaging does not yet provide the necessary accuracy

Distortion of anatomy due to device rigidity

Solution

- Mark the target vessels with catheters
- Use either CO₂ or diluted iodinated contrast medium for confirming land marks
- Use AP and lateral views
- This approach always provides precise orientation













Limitations of CO2

- Increased radiation dose
- CO₂ does not visualise posterior vessels
- May result in "vapour lock" when used excessively



Conclusion

- Fusion imaging is promising but needs further development
- CO₂ "vapour lock" can be avoided by limiting the dose to 100cc/10min
- The combination of CO₂ and diluted iodinated contrast provides adequate intra-operative imaging