

Invasive Angiography For Limbs CTA vs MRA

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Objectives of Imaging

- Evaluation for Non-medical management of the patient with claudication
 - mapping of sites of stenosis or occlusion
 - analyzing best management plan
 - Surgical
 - Endovascular
- Providing comprehensible data to aid patient understanding

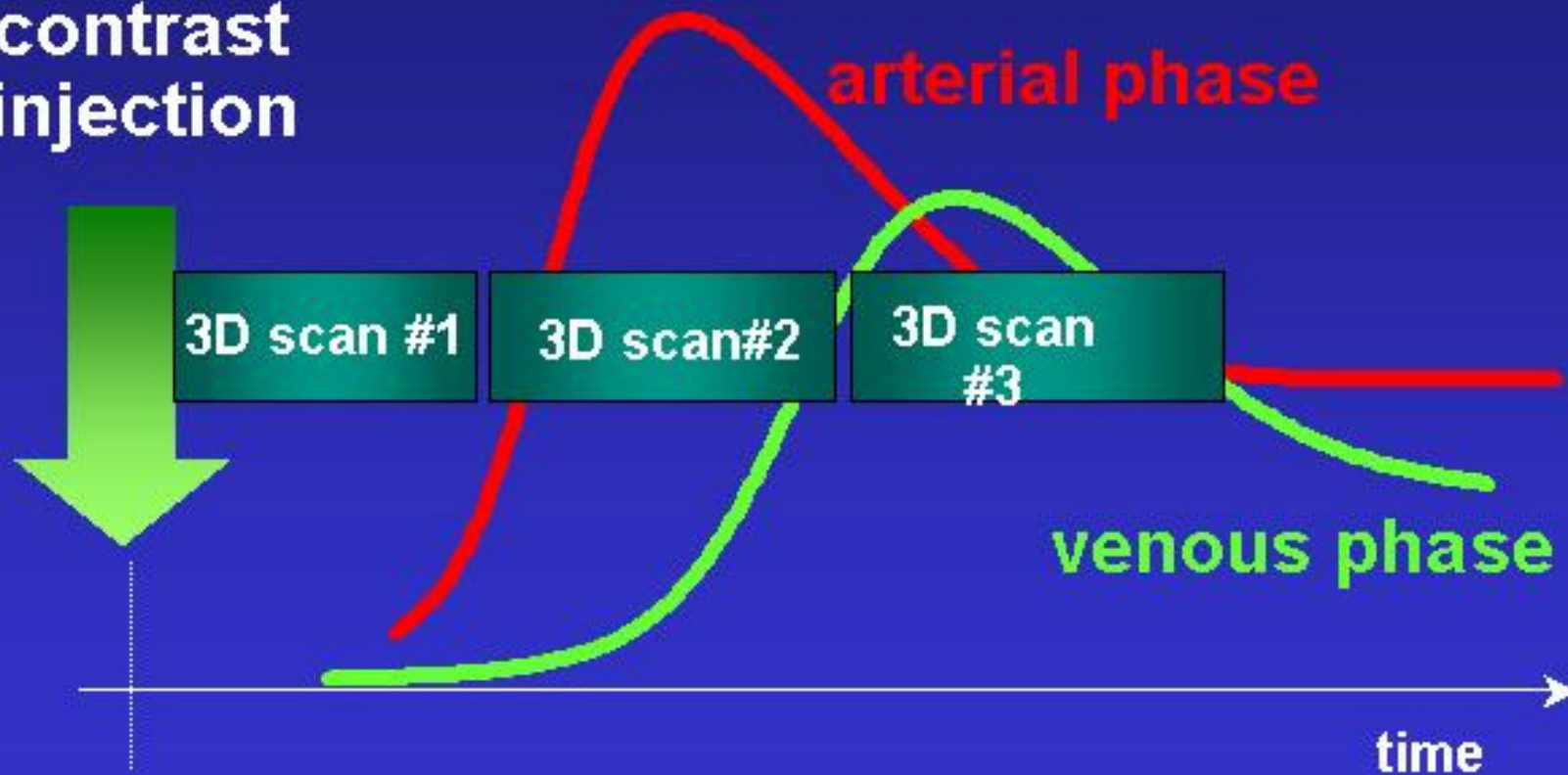
What is MRA?

- Currently offers a reliable alternative to conventional angiography to diagnose pathology in all major vascular territories
- Safer, cheaper, and more convenient for patients than conventional arteriography
- No radiation
- Non-nephrotoxic contrast agents
- Multiphase imaging including arterial venous and delayed venous
- Minimally invasive

- But, cannot visualize calcium!!!!

Dynamic Contrast-Enhanced MR Angiography

contrast
injection



Peripheral MRA

Diagnostic Accuracy:

Authors	Year	# of Patients	Sensitivity	Specificity
Prince et al.	1995	43	94	98
Snidow et al.	1996	32	100	98
Hany et al	1997	39	93	96
Ho et al.	1998	28	93	98
Meany et al.	1998	20	95	98

Total Patients = 162 Avg. Sensitivity = 95% Avg. Specificity = 98%

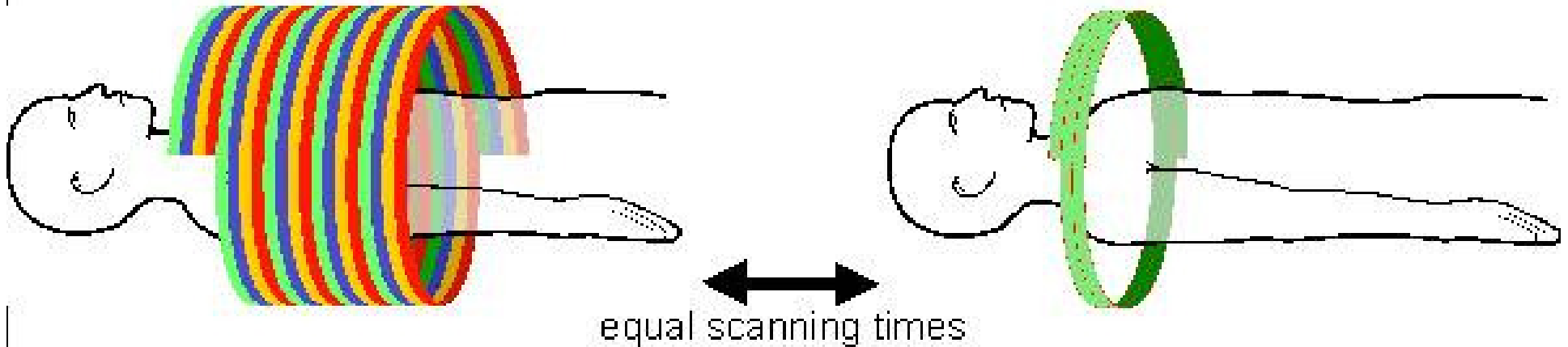
CTA of the Lower Extremities

- Prospective study of the 23 patients with lower extremity peripheral vascular disease
- Comparison of 4-channel CTA to DSA to identify significant stenosis
- Specificity 87% proximal to the trifurcation and 80% distal to the trifurcation

MSHCT is 8 times faster than SSHCT

MSHCT { Quad-channel
0.5 second gantry rotation time

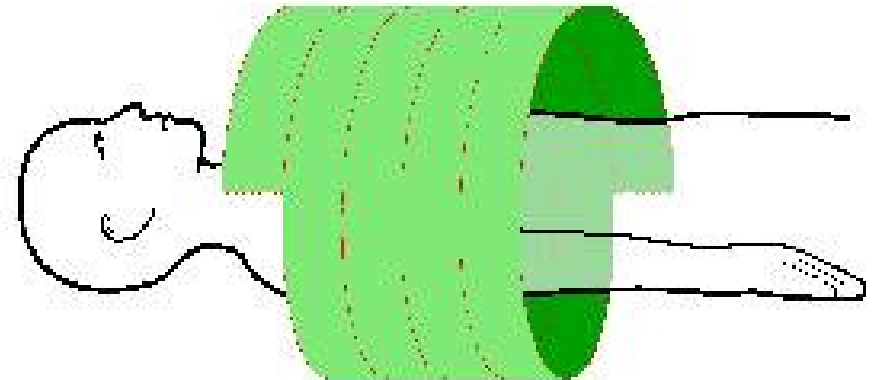
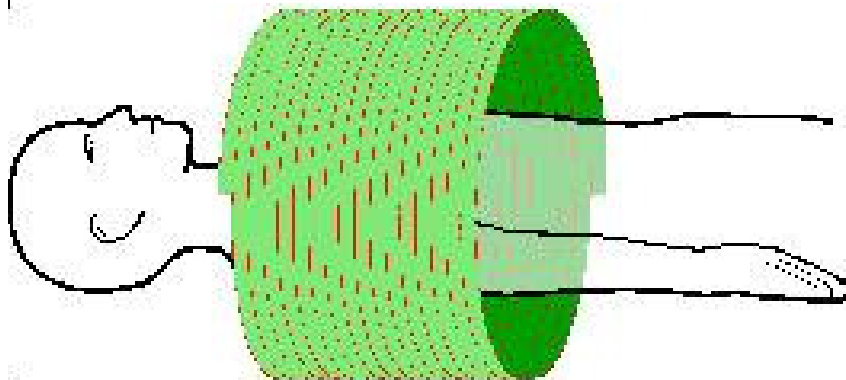
SSHCT { One-channel
1.0 second gantry rotation time



To cover the same distance with SSHCT a trade-off in time or resolution is required:

Longer scanning time

Wider collimation



C.T.A.

vs.

M.R.A.

- Radiation
- Quick
- Can visualize calcium
- Bone separation more difficult
- More accurate?
- Available and inexpensive

- No Radiation
- Time consuming
 - Patient Cooperation
- Can't see Ca⁺⁺
- TRICKS – dynamic imaging
- Lower Linear Resolution
 - Signal loss secondary to inplane flow, turbulence
- Less available and more costly
- Failure rate
 - STENTS

Recommendations

- 3D Gadolinium MRA – Coronal Plane
- Flip angle: 60 degrees
- Minimize slice thickness (2 mm good; 3 mm acceptable)
- Minimal TR/TE
- Matrix: 512 x 256
- Bandwidth 62.5

NEW TECHNIQUES IN IMAGING

- Time Resolved (Dynamic MRA)
- Whole Body Imaging (Screening)

In Summary

- CTA and MRA offer safe high-resolution imaging of all peripheral vascular beds with very high sensitivity and specificity to diagnose pathologic states
- At our institution –
 - Proximal dz → CTA
 - Evaluating stents → CTA
 - Tibial disease → MRA
- Technological advancements will only improve to results and use of this technology