Alternativ Endo techniques for the Arch

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VASCULAR CENTER MALMÖ

Avalaible endo techniques for the arch

- Chimneys, periscopes, sandwich techniqes
- Fenstrated and branched stent-grafts
- Hybrid procedures
- In situ fenestrations

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Is the in situ fenestration technique needed?

- **Arch?**
- **Left subclavian artery?**

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In situ fenestration for total arch

Completion angiography

6 year follow-up

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In situ fenestration for total arch?

- Brain perfusion during fenestration procedure
- Temporary by-pass from infrarenal aorta (femorals) to the carotids with or without pump
- Introducer shunts
- Elective- branch graft
- Emergent/ semi emergent-in situ fenestration.

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Is the in situ fenestration technique needed?

- Arch?
- **Left subclavian artery?**

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Surgical revascularization of left subclavian artery

Subclavian revascularization in the age of thoracic endovascular aortic repair and comparison of outcomes in patients with occlusive disease

Salvatore T. Scali, MD, Catherine K. Chang, MD, Stephen G. Pape, BS, Robert J. Feezor, MD, Scott A. Berceli, MD, PhD, Thomas S. Huber, MD, PhD, and Adam W. Beck

Objective: Open surgical revascularization for subclavian artery occlusive disease (OD) endovascular treatment despite the excellent long-term patency of bypass. The indicatio (C-SBP) and subclavian transposition (ST) have been recently expanded with the wid endovascular aortic repair (TEVAR), primarily to augment proximal landing zones or t study was performed to determine the outcomes of patients undergoing C-SBP/ST i endovascular therapies and evolving indications.
Methods: A prospective database including all procedures performed at a single instit retrospectively queried for patients who underwent subclavian revascularization for TE demographics and perioperative outcomes were recorded. Patency was determined by con in the TEVAR group. Noninvasive studies were used for the OD patients. Life-table patency, reintervention, and survival.
Results: Of 139 procedures identified, 101 were performed for TEVAR and 38 for OD. C-SBP/ST to augment landing zones (49% preoperative; 41% intraoperative), treat arm for internal mammary artery salvage (2%). OD patients had a variety of indications, inc 49%; asymptomatic >80% internal carotid stenosis with concurrent subclavian occlusion cular OD, 13%; redo bypass, 8%; and coronary-subclavian steal, 5%. Differences in p primary patency, or freedom from reintervention were not significant. The 30-day p combined stroke/death rates were, respectively, 10.8%, 5.8%, and 13.7% for the entire c TEVAR patients; and 15.8%, 2.6%, and 15.8% in OD patients. The 1- and 3-year prim 94% and 94% for TEVAR and 93% and 73% for OD patients. Survival was similar betwe survival rate of 88% at 1 year and 76% at 5 years.
Conclusions: Stroke risk in this contemporary series of C-SBP/ST performed for TEV higher than previously reported in historical series. In TEVAR patients, this may be attr of the TEVAR in patients requiring subclavian revascularization. In OD patients, this is li population that requires more frequent concomitant carotid interventions. Despite the bypass durability and equivalent long-term patient survival can be anticipated. (J Vasc S

Carotid-subclavian bypass and subclavian-carotid transposition in the thoracic endovascular aortic repair era

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Ann Arbor, Mich; and Boston, Mass

Objective: Beyond traditional indications, subclavian revascularization is increasingly performed to allow for aortic arch debranching in the setting of thoracic endovascular aortic repair (TEVAR). Endovascular treatment options for subclavian disease have emerged, perhaps altering the patient population undergoing open revascularization. We leveraged prospectively collected American College of Surgeons (ACS)-National Surgical Quality Improvement Program (NSQIP) data to delineate evolving stroke and mortality rates after carotid-subclavian bypass (CSB) and subclavian-carotid transposition (SCT) in this dynamic context.
Methods: The ACS-NSQIP database (2005 to 2010) was queried for patients who underwent CSB or SCT. Patients admitted for emergency cases were excluded. Factors associated with 30-day postoperative cerebrovascular accident (CVA) or death (CVA/D) were defined using univariable and multivariable analyses.
Results: CSB comprised 41% of revascularizations associated with TEVAR and 59% of isolated revascularizations. A greater proportion of TEVARs were performed in the SCT group (67% vs 12%; P < .01). The groups were similar in demographic characteristics and prevalence of comorbidities. Overall stroke, mortality, and combined CVA/D rates were 3.5% (n = 7), 3.3% (n = 29), and 5.8% (n = 51), respectively. Surgical approach did not affect outcome. The CVA/D rate was 10.2% (n = 9) for revascularization in conjunction with TEVAR and 5.3% (n = 42) for isolated reconstruction (P = .06). For patients undergoing isolated revascularization, increasing age (adjusted odds ratio, 1.06; 95% confidence interval, 1.03–1.10; P < .01), and nonindependent functional status (odds ratio, 3.49; 95% confidence interval, 1.41-8.68; P < .01) were significantly associated with CVA/D.
Conclusions: In this contemporary data set, there was no significant difference in CVA/D by surgical approach. TEVAR trended toward an association with CVA/D compared with isolated subclavian reconstruction. CVA/D continues to complicate contemporary CSB and SCT, especially among nonindependent patient subsets. (J Vasc Surg 2013;57:1275-82.)

Combined stroke/death rate 6-14%

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Fenestration technique

- Needle
- RF (radio-frequency)
- Laser

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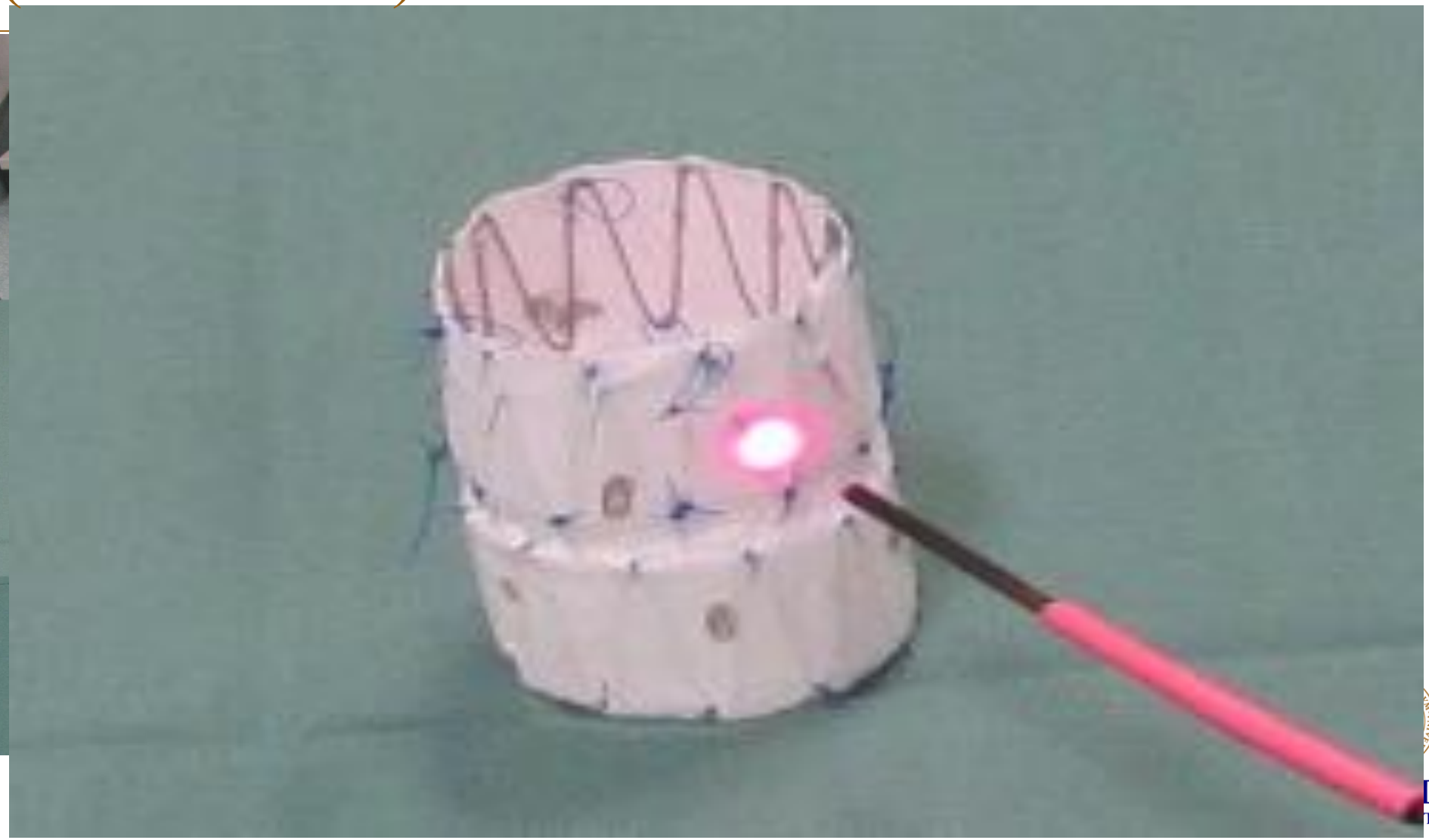
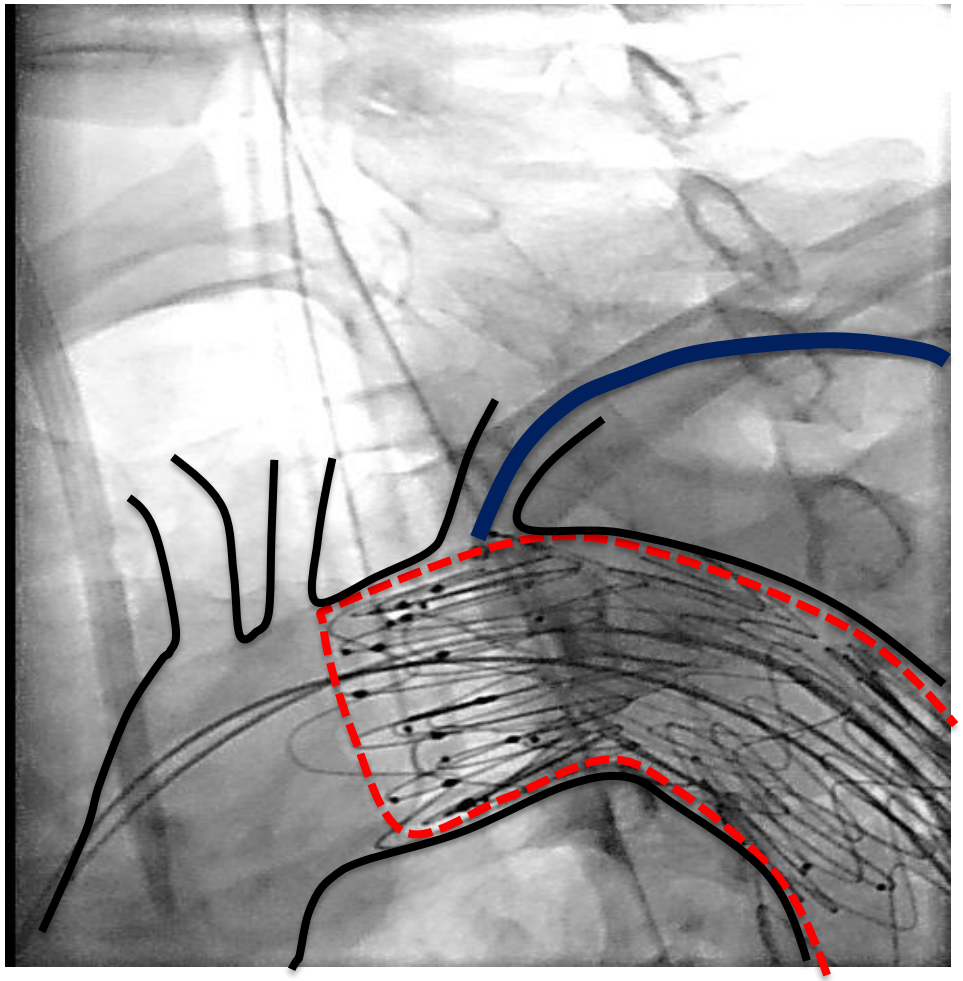
Excimer (blue “cold”) laser



In situ fenestration LSA



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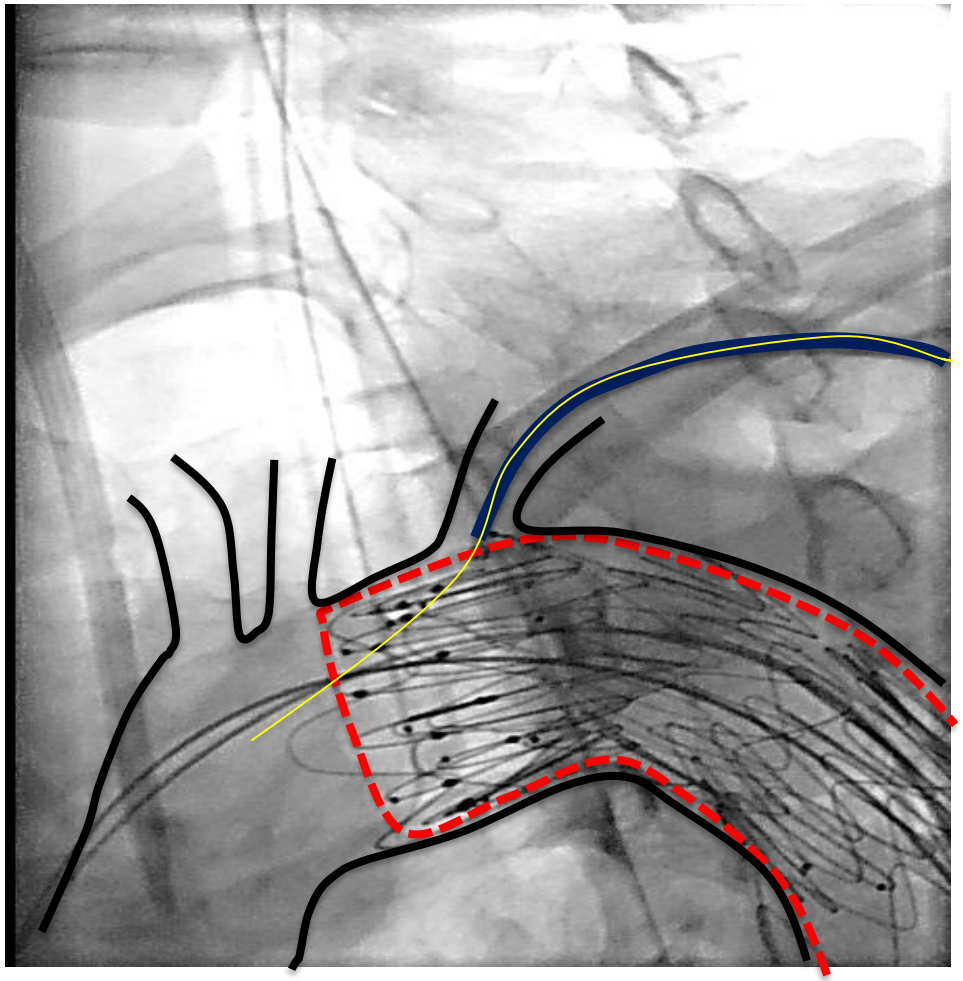
In situ fenestration LSA



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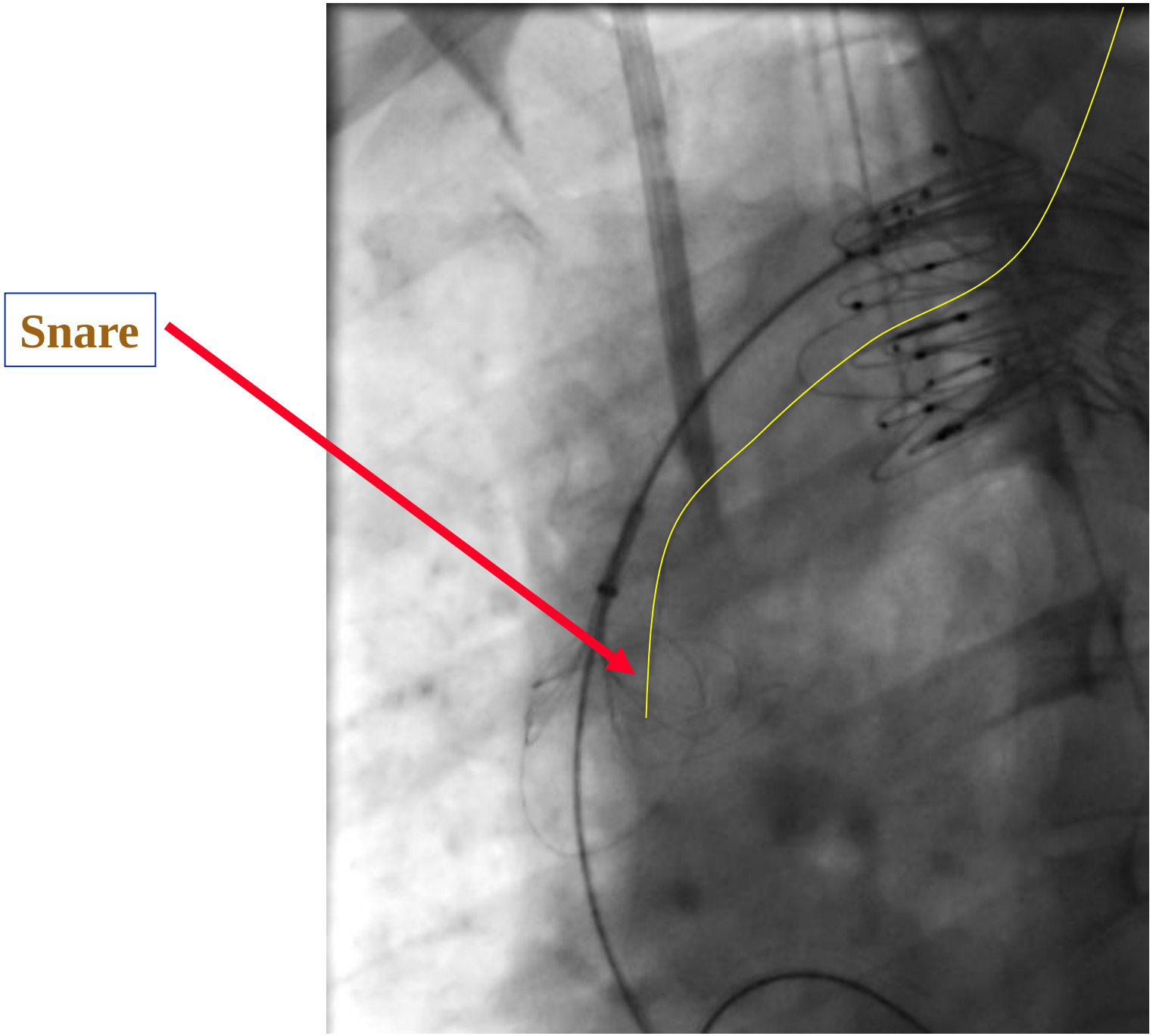
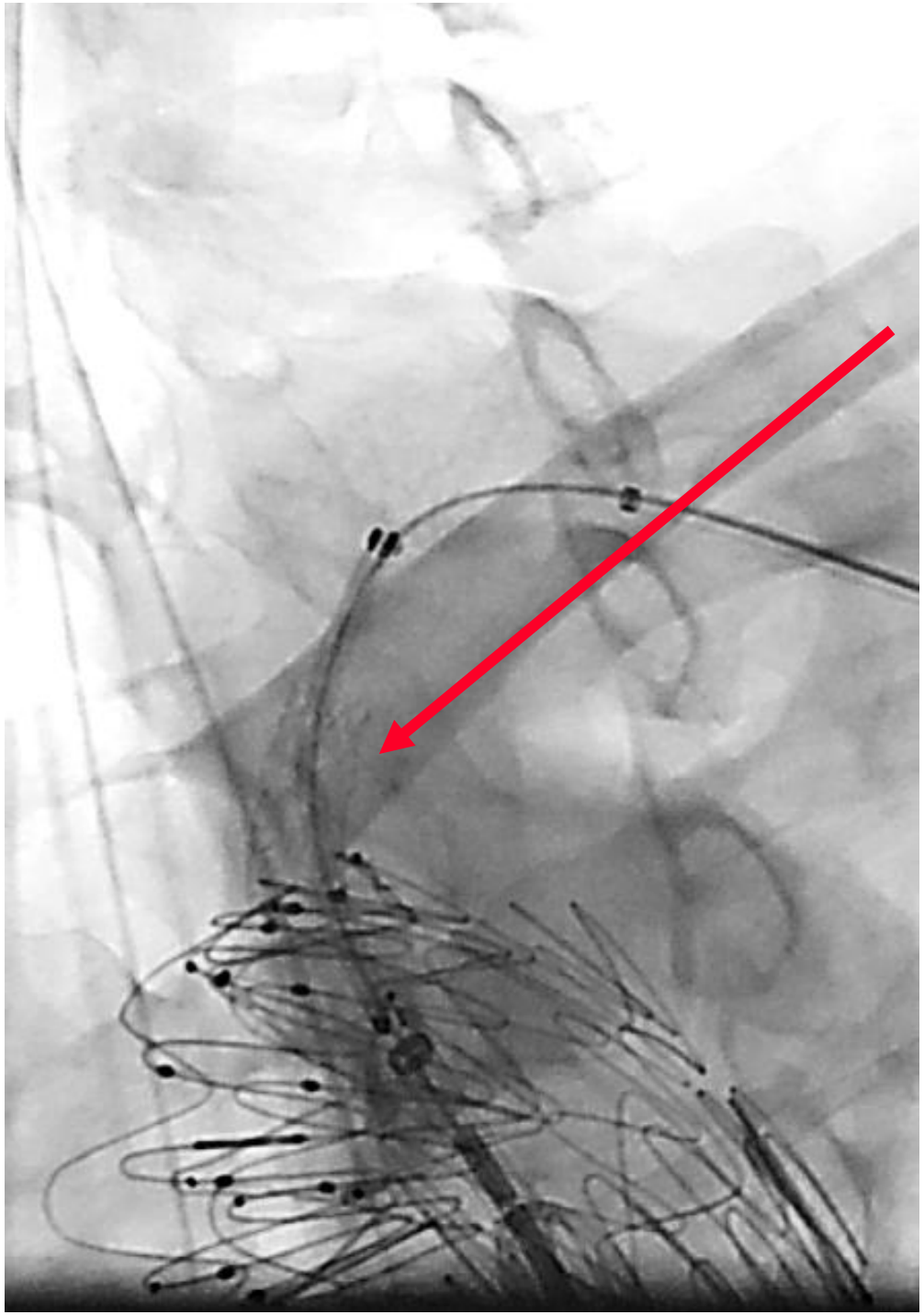

Snare



Fluency (femoral approach)


32:03
Avanta 7/22
Visipro 8/17
Fluency 10/40
Protege 10/20
ZTA-P-34--209
TBE-P-34-77-PF
32:03
F

Laser assisted *in situ* fenestration for LSA in Malmö

- n=9 since 2014
- n=8 technichal success
- no 30 day death/stroke (1 TIA carotid territority-chimney)
- All fenestrations patent and all patients alive Nov 2015

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Factors for succesful percutaneous laser fenestration of left subclavian artery

- Angel /subclavian artery /aorta
- Shape/configuration guiding catheter/sheat

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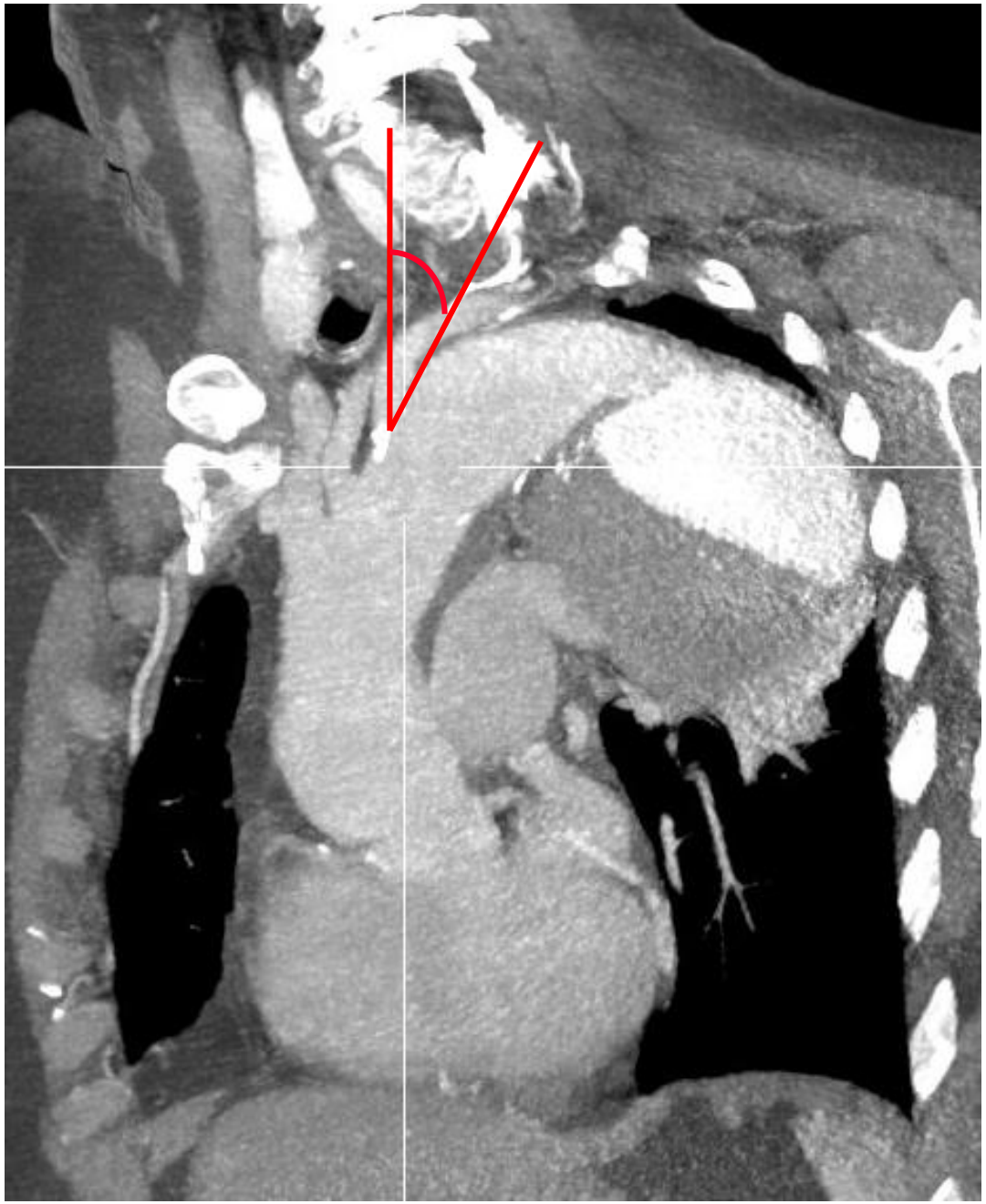
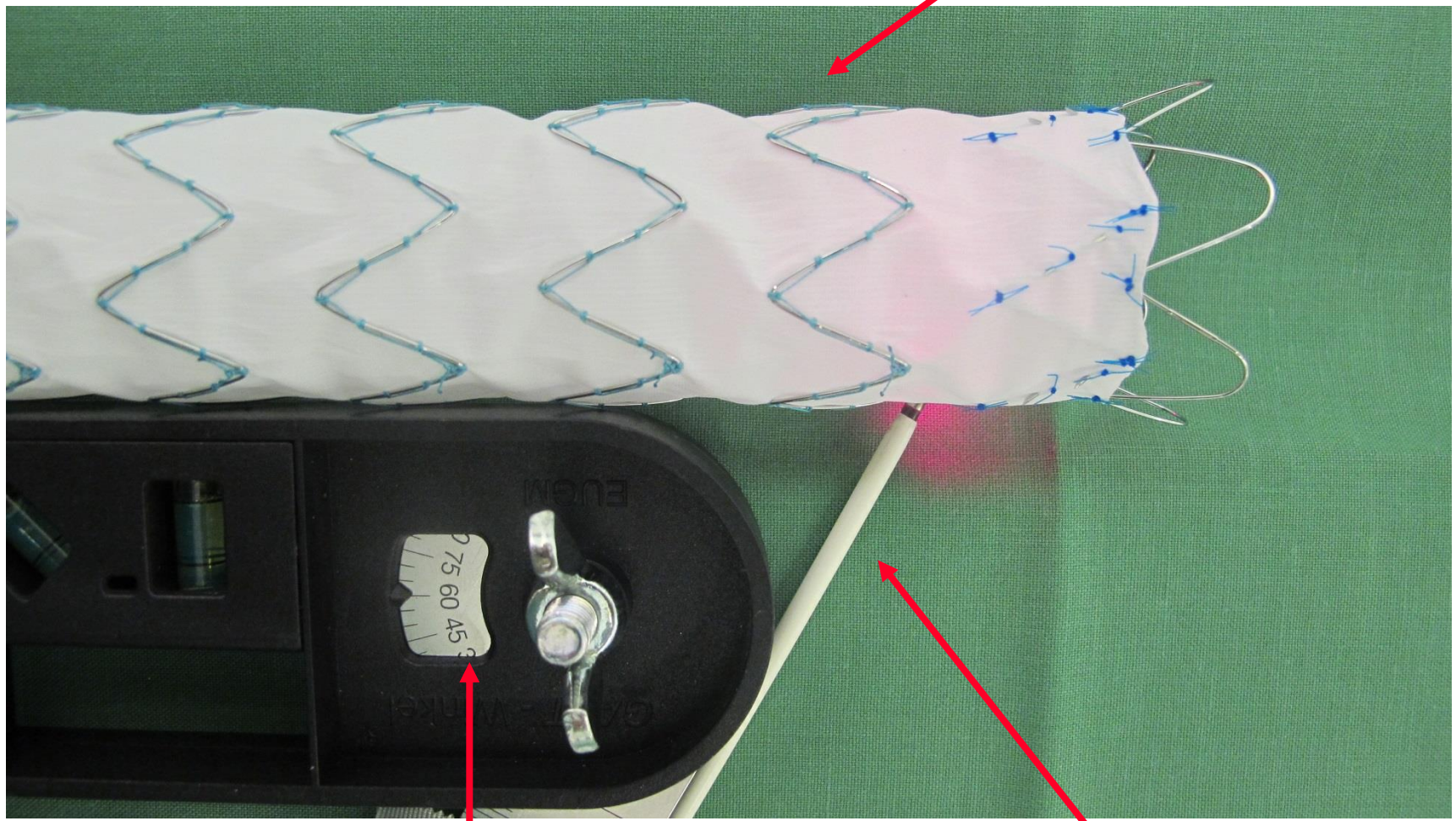
15:39:17
15:39:17
24
F

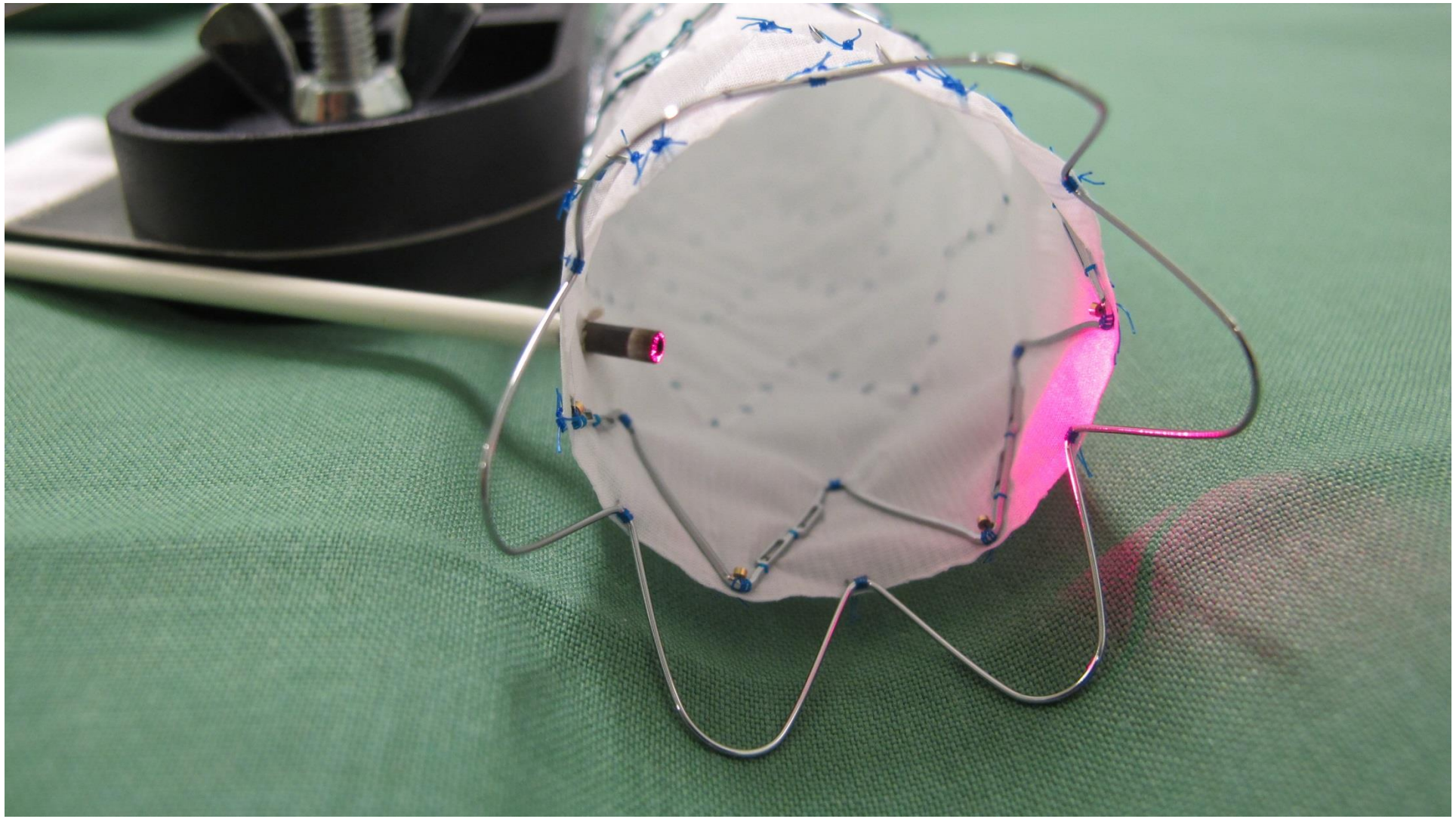


Stent graft

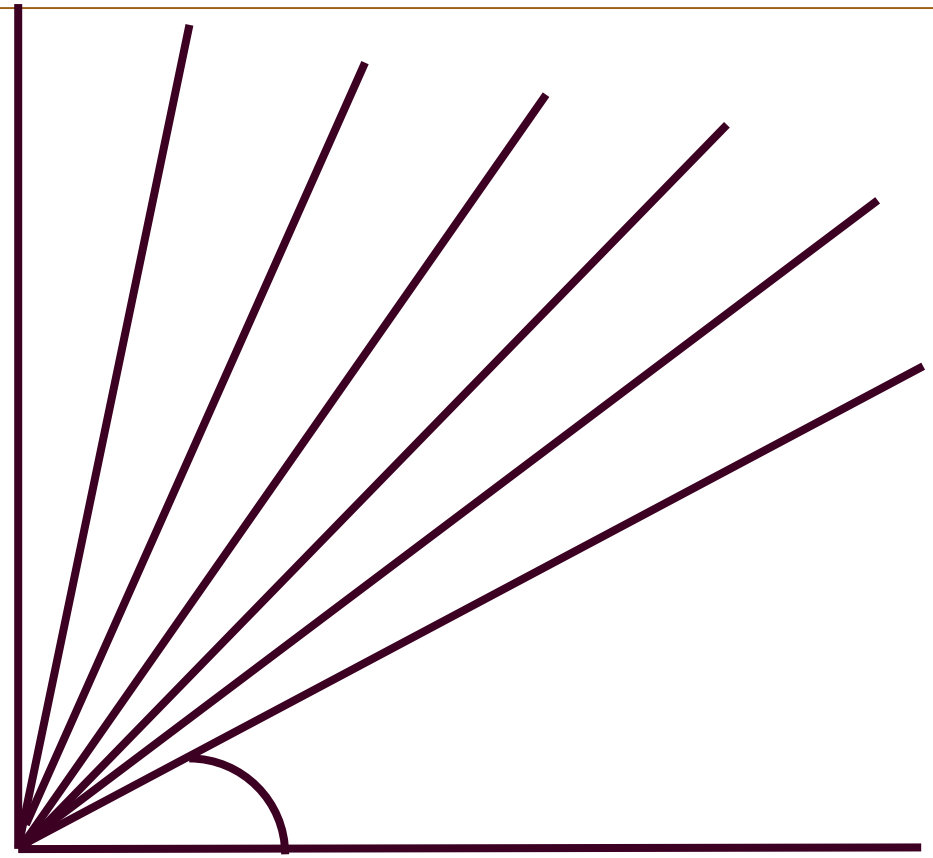


Angel laser/stent graft

Sheat with laser



Result Bench Test



30 degrees

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Factors for succesful percutaneous laser fenestration of left subclavian artery

Angel /subclavian artery /aorta

Shape/configuration guiding catheter/sheat

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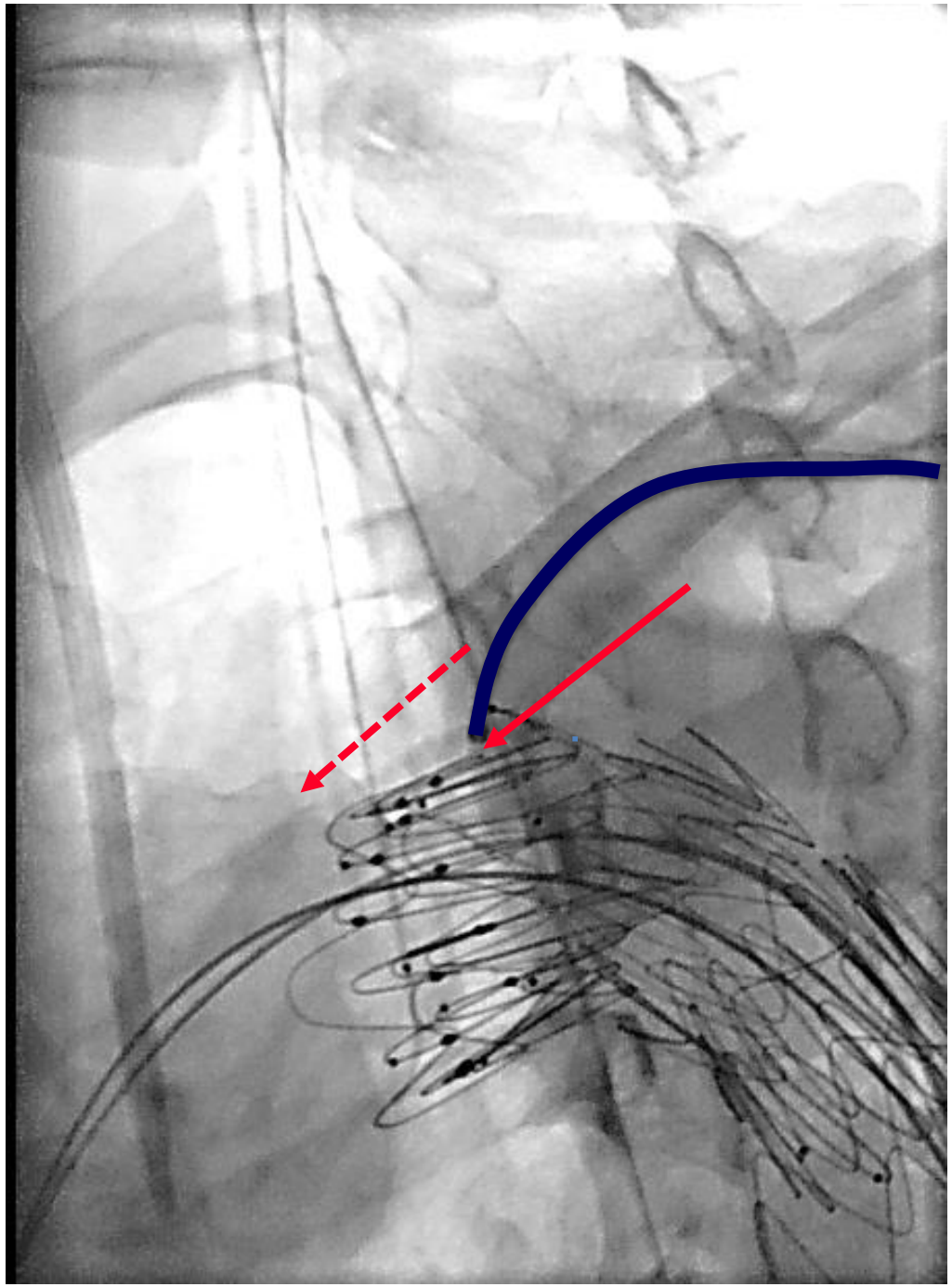

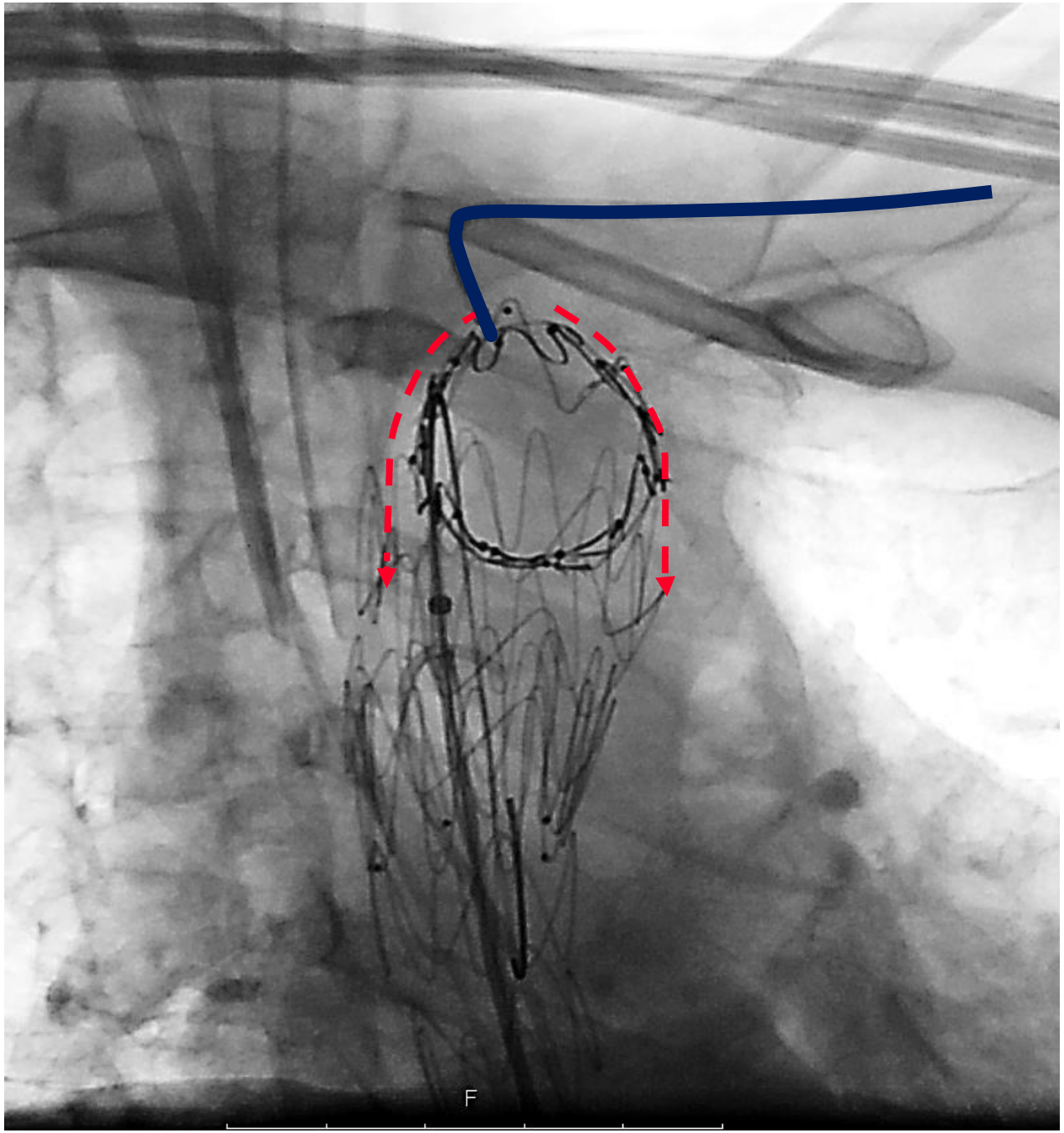

Steerable sheat
IM guide catheter

Risks of embolization with laser fenestration?

- Direkt effect on the endothelium-thrombosis
- Embolization
- Graft material
- Clot

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Animal model

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Evaluate potential embolization by placing a carotid protection filter down streams

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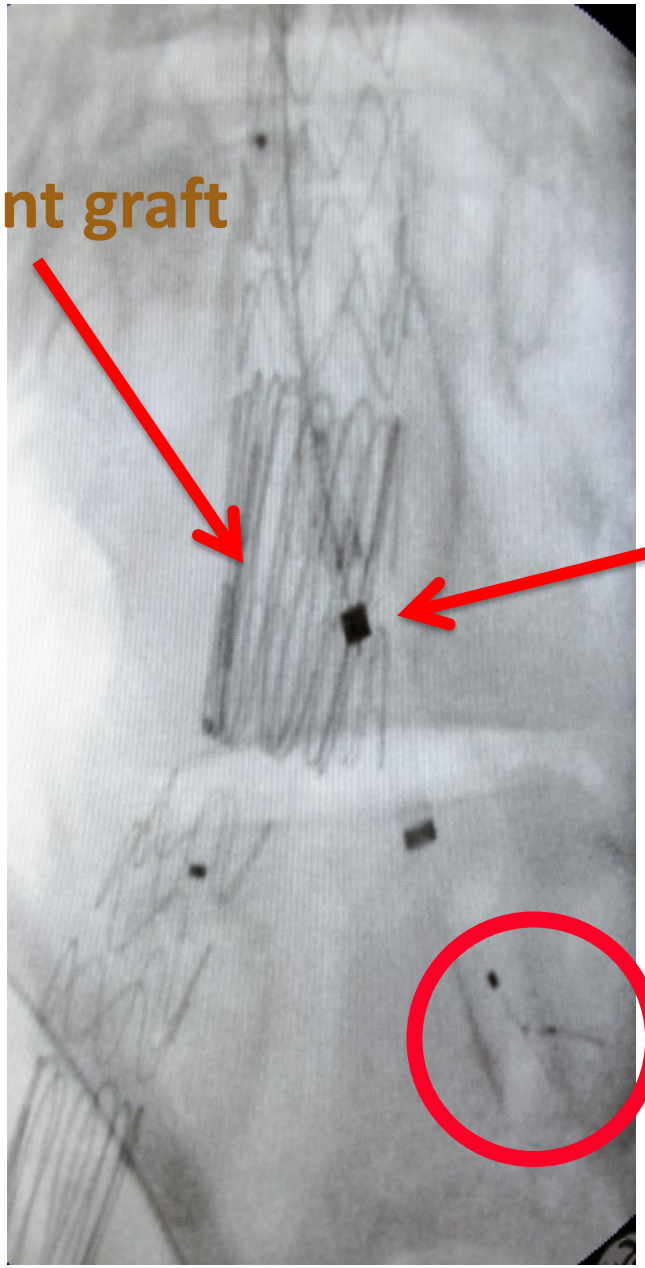
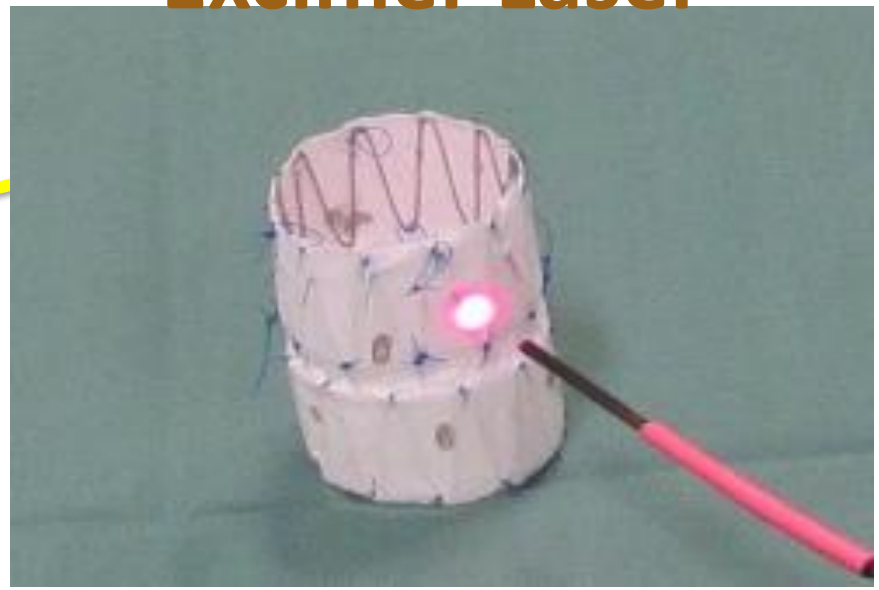

Stent graft
Laser
Carotid protection Filter

Stent graft

Excimer Laser



Carotid protection Filter

Filter retrieval

Result

Number (n)	Weight (kg)	Operative time (min)	Fabric type of Dacron		Emboli/clot
1	90	150	Low profile	Reversed ZSIL 20-93	no
2	90	170	Standard	CMD ZSLE 16-80	no
3	78	139	Low profile	Reversed ZSIL 20-93	no
4	90	140	Low profile	Reversed ZSIL 20-93	no
5	90	170	Standard - Low profile	Reversed ZSIL 20-93 + TFLE 13-39 # 	no
6	90	210	Standard	TX2 20-127	no
7	78	195	Low profile	ZSIL 20-93	no

7

No emboli/clot

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Conclusions

- In situ fenestration total arch-emergent/ semi urgent situation
- Laser fenestration might be an option for LSA revascularization.
- Angel between subclavian artery/aorta important
- Percutaneous brachial approach feasible
- No embolization of clot or graft material during laser fenestration.

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