



COMPLICATIONS OF SUPRAORTIC DEBRANCHING

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Disclosure

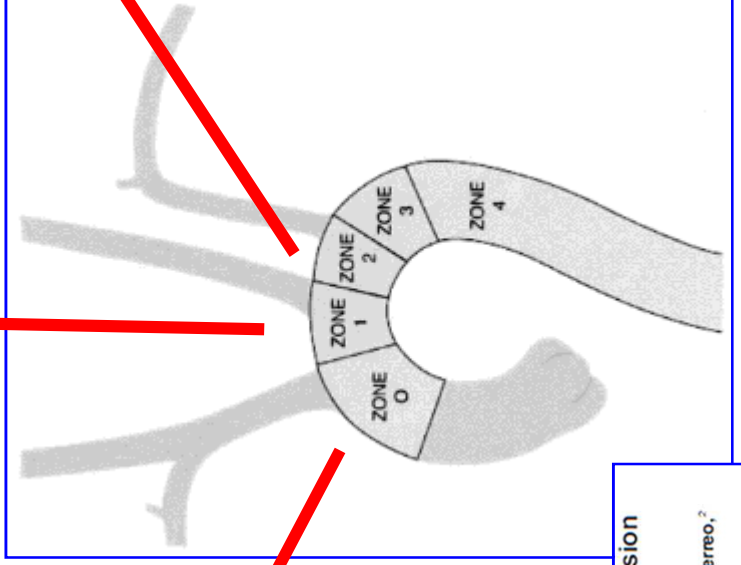
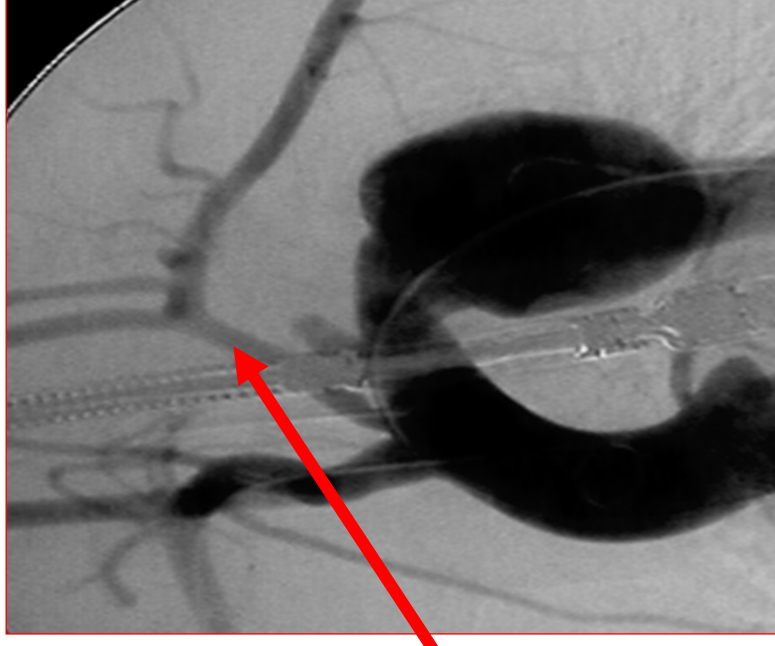
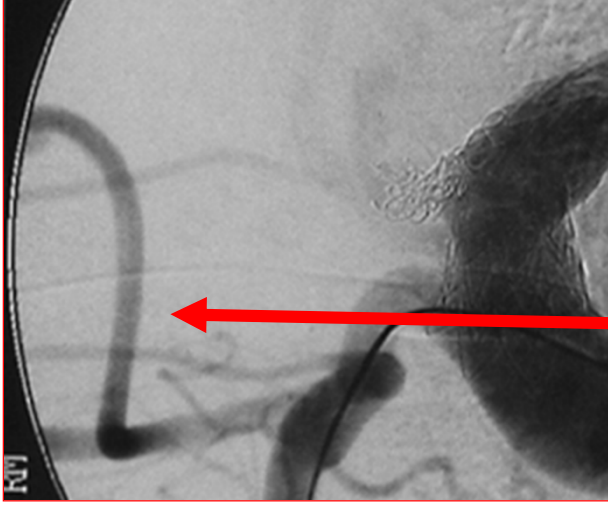
Speaker name:

.....SONIA RONCHEY.....

I have the following potential conflicts of interest to report:

- Consulting SEROM
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest



Great Vessel Management for Endovascular Exclusion of Aortic Arch Aneurysms and Dissections

P. Bergeron,^{1*} N. Mangialardi,² P. Costa,² P. Coulon,¹ V. Douillez,¹ E. Serreo,² I. Tuccimei,² C. Cavazzini,² F. Mariotti,² Y. Sun¹ and J. Gay¹

HYBRID PROCEDURE MORTALITY

- USUALLY **< 10%** (0-25%)*
- IN ZONE 0 is higher
8,46% vs 4,58% **
- IN EMERGENCY IN ZONE 0 is enormous
50% vs 31% ***

* Antoniou – Eur J Vasc Endovasc Surg 2010

** Kotelis – J Vasc Surg 2011

*** Geisbuesh – J Vasc Surg 2011

Debranching COMPLICATIONS

DIFFICULT TO EVALUATE

55-100%

Sincronous DEBRANCHING & TEVAR

Endografting of the Thoracic Aorta

314 pts (2002-2015)

Debranching 138 pts (43,9%)

- SURGICAL 122 (88,4%)
- SURGICAL + Chimney 16 (11,6%)

2 STEPS 97 (70,2%)

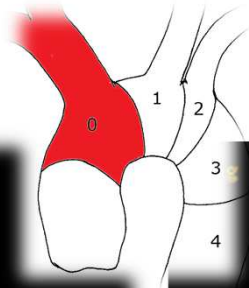
One step 37 (26,8%)

DELAYED LCCA-LSA bypass 4 (3,0%)

(2total deb; 1 ca-car;1 trauma)

SURGICAL DEBRANCHING+ CHIMNEY 16/138

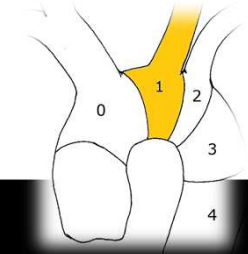
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**Chimney Technique for Aortic Arch Pathologies:
An 11-Year Single-Center Experience**

Nicola Mangialardi, MD; Eugenia Serrao, MD; Holta Kasemi, MD; Vittorio Alberti, MD;
Stefano Fazzini, MD; and Sonia Ronchey, MD, PhD

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J Endovasc Ther. 2014;21:312–323

Debranching total surgery 138 (43,9%) (2002-2015)

62	LCCA-LSA bypass (3 secondary)
15	subclavian transposition
13	carotid-carotid bypass*
32	Carotid-carotid-subclavian bypass
12	Total debranching of the arch**
1	Axillo-axillary bypass
3	Carotid axillary bypass

* 1 case associated with banding

** 4 cases associated with banding

DEBRANCHING → MORTALITY

- CERVICAL 0-4%
- THORACIC 4-20%

BERGUER – J VASC SURG 1999
OZSAVATH – J VASC SURG 2003
GEIBUESH – J Vasc Surg 2011
OSKOWITZ – J CARDIOVASC SURG 2015

DEBRANCHING → PATENCY

- CERVICAL (5 YRS) 91-98.7%
- THORACIC (10 YRS) 88%

BERGUER – J VASC SURG 1999

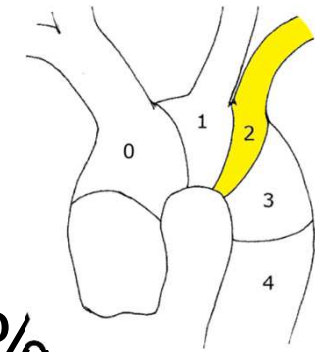
OZSAVATH – J VASC SURG 2003

REECE – ANN THORACIC SURG 2007

DE RANGO-J VASC SURG 2014

OSKOWITZ – J CARDIOVASC SURG 2015

Landing in zone 2



30 DAYS COMPLICATIONS 1-5%

Domening – Eur J Vasc Endovasc Surg 2008

Lee – Ann Thoracic Surg 2011

Czerny – Eur J cardiothorac Surg 2011

PATENCY

TRANSPOSITION

98-100%

BYPASS

86%

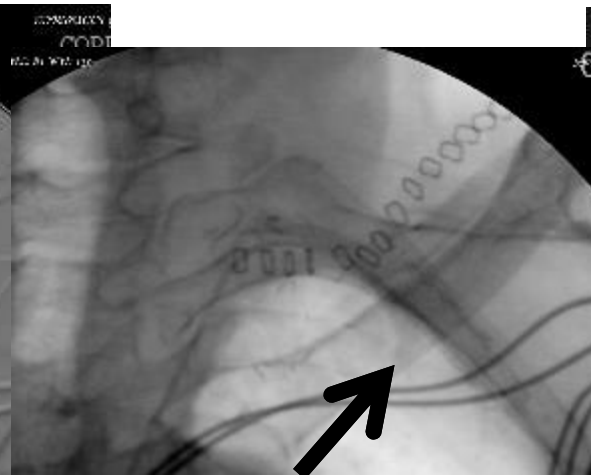
1. Rehhman – Eur J cardiothorac Surg 2011

2. Rutherford, Ouriel: Atlas of Vascular Surgery. Operative Procedures

1/15 (6.6%) LSA transposition → DISSECTION

→ ISCHEMIA

STENTING



OTHER COMPLICATION TRANSPOSITION RELATED

- MAJOR LYMPHORRHOEA
1/15 (6.6%)
- HORNER SYNDROME

Subclavian revascularization Complications: meta-analysis

- Nerve injuries 8,6%
- Lymphatic leak 2,5%
- Thrombosis 1,1%
- Haemorrhage 1,1%
- Stroke 0,7%

- Graft infection/mortality 0

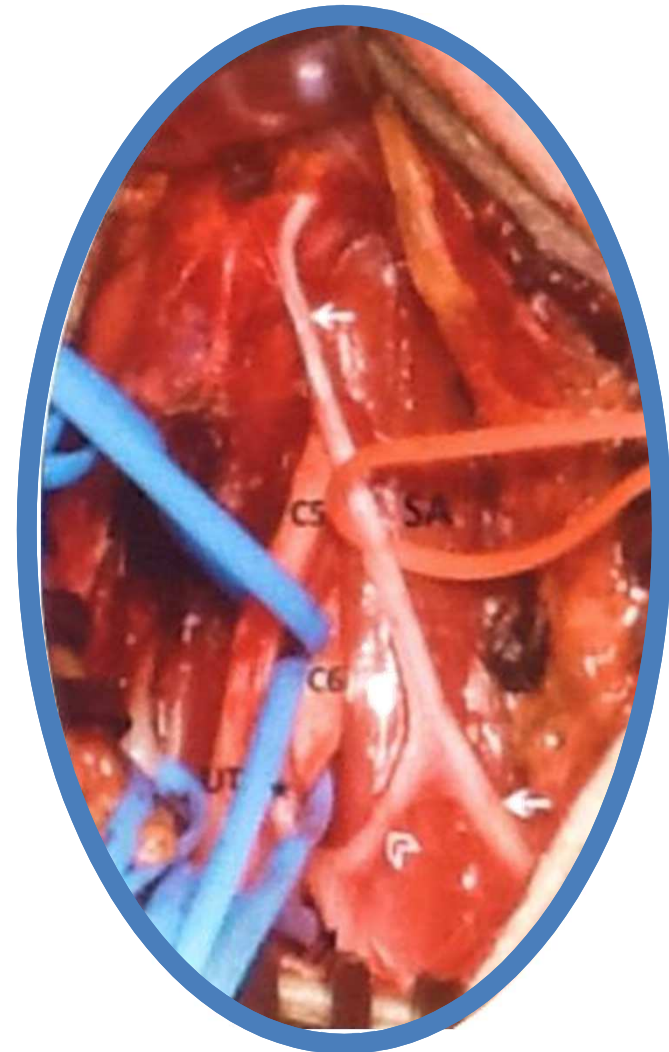
Subclavian revascularization Complications

Nerve injuries 8,6%

Mind the accessory phrenic nerve (present in 68%)!!!

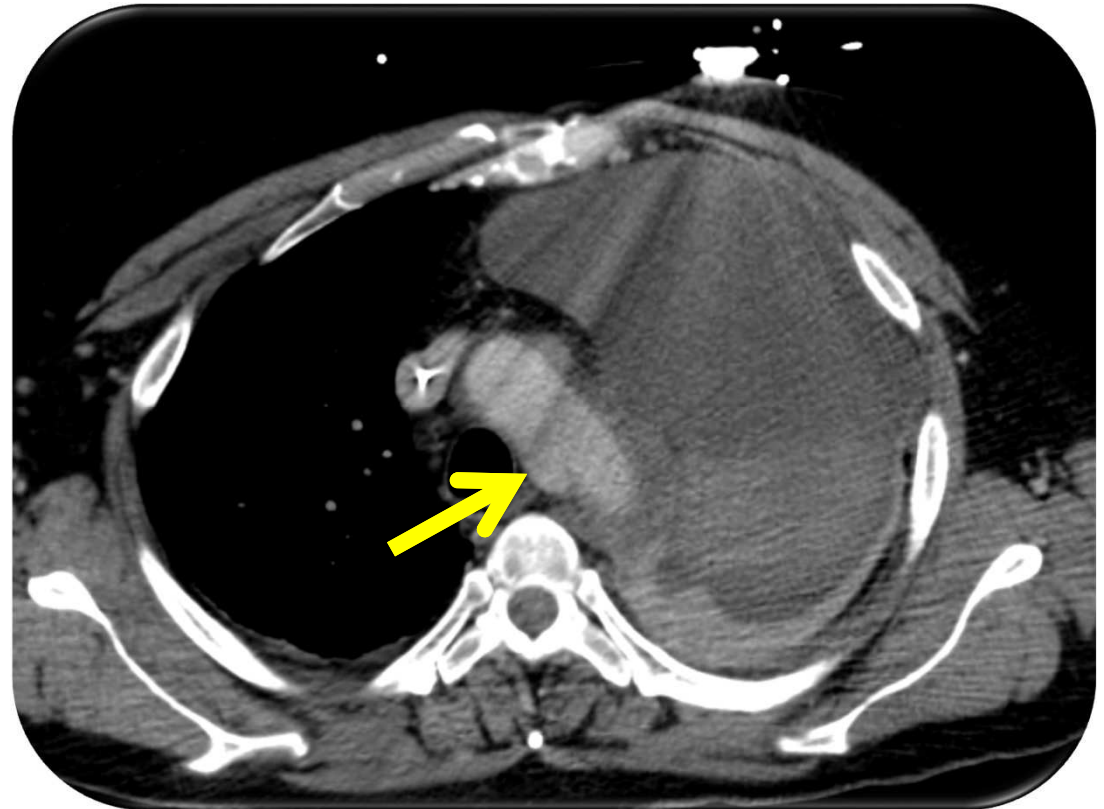
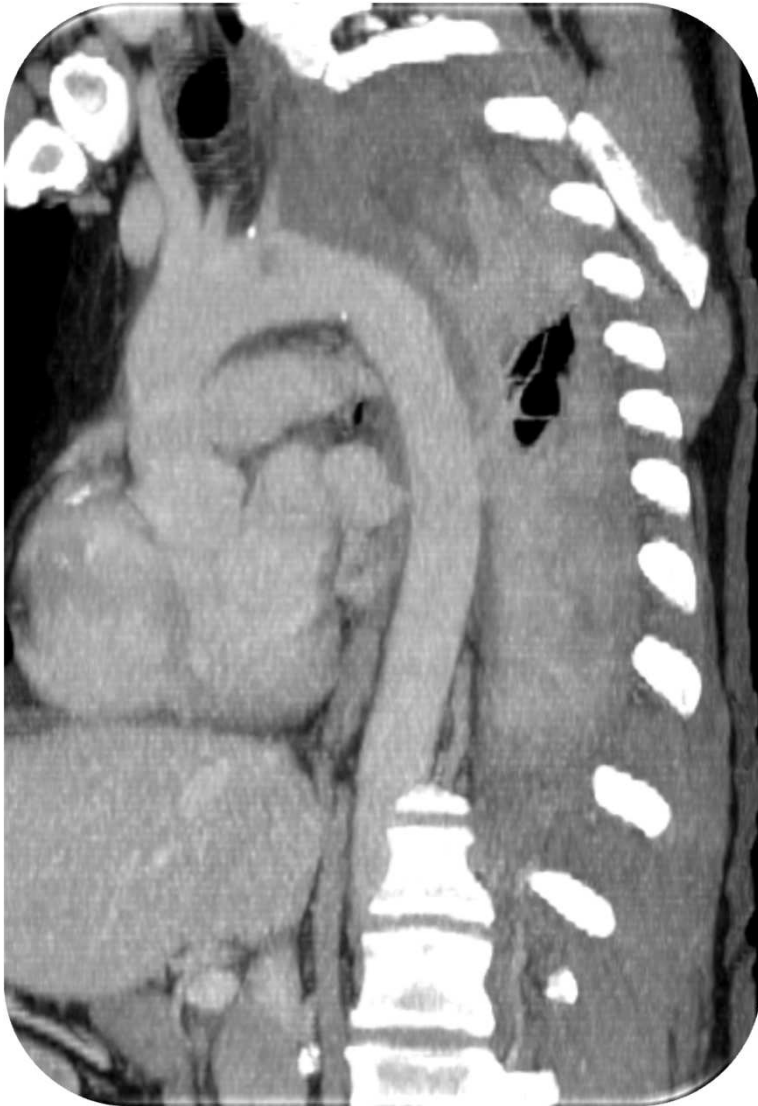


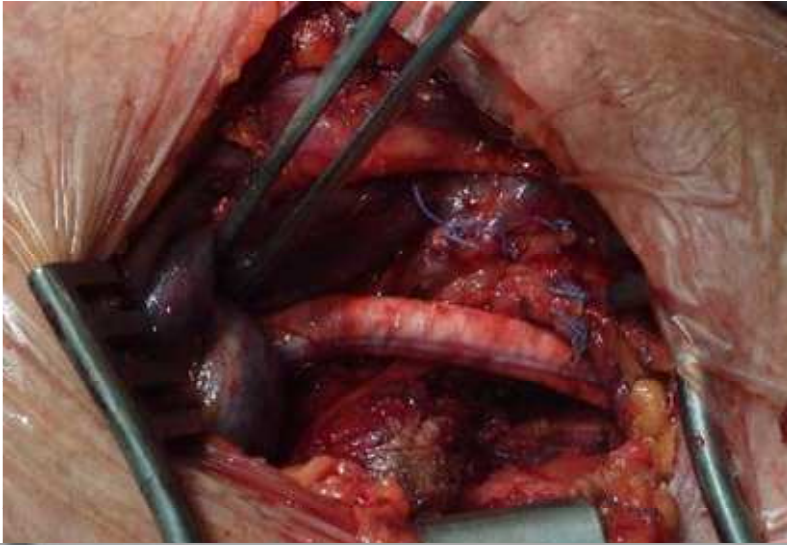
Diaphragmatic palsies



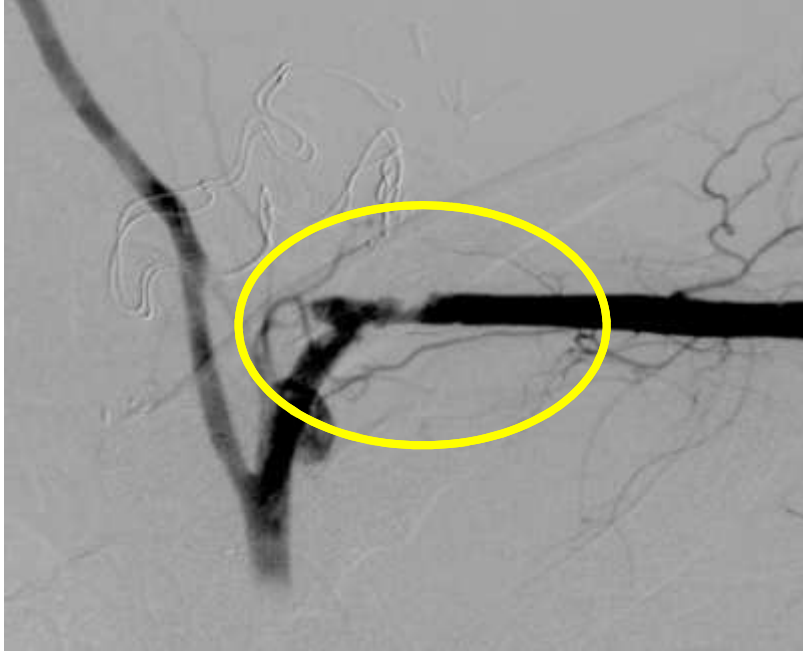
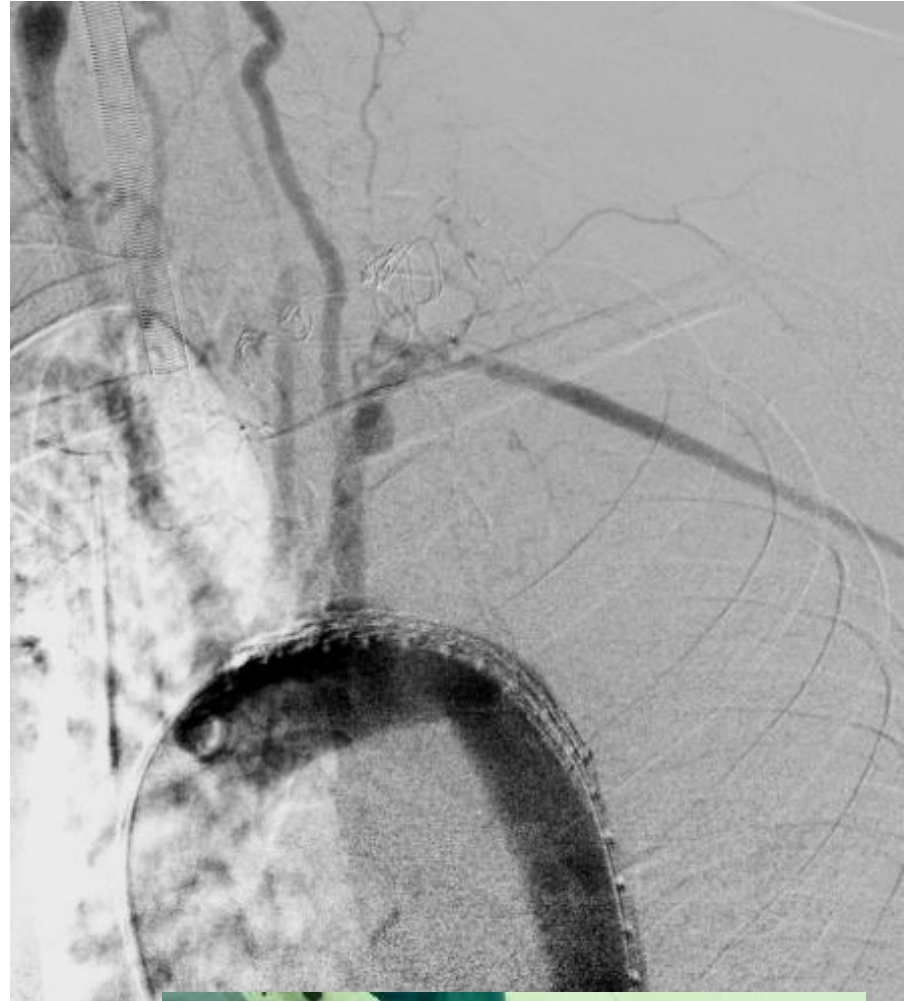
EMERGENCY SETTING

Aortic arch ulcer: tamponade rupture
sincronous LCCA-LSA





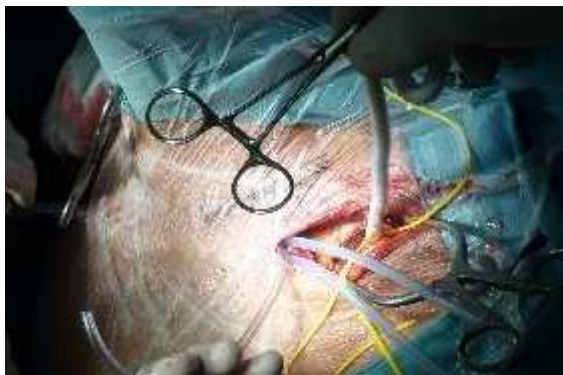
Diseased LSA



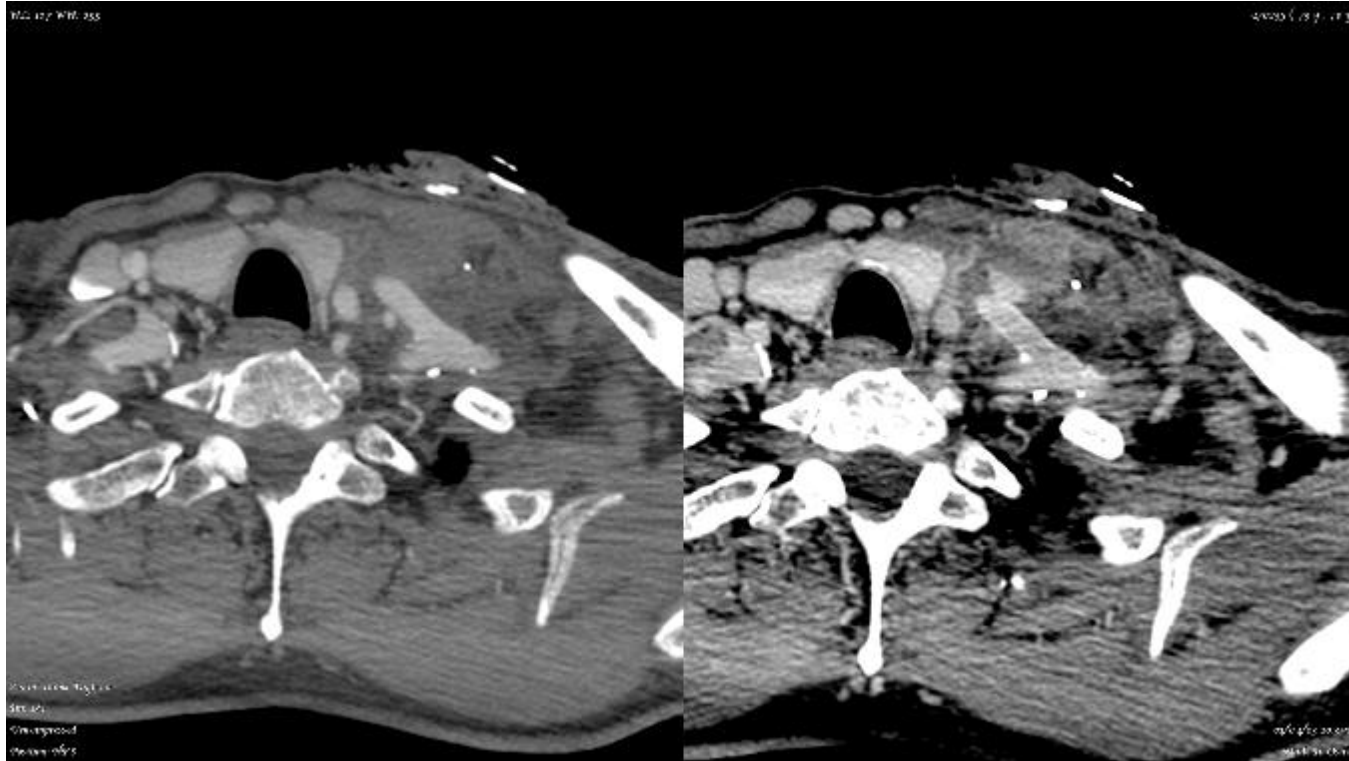
ARM ISCHEMIA



Axillo-axillary bypass



INFECTION



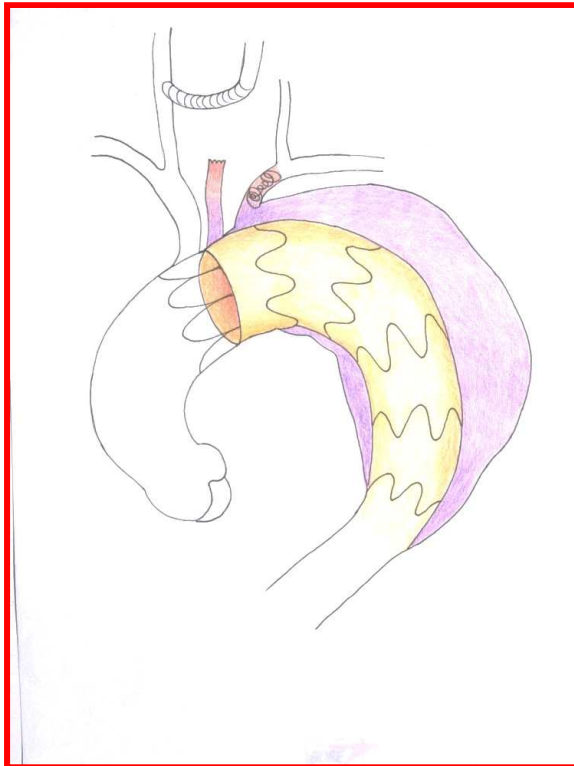
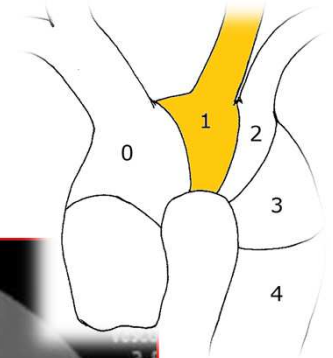
GRAFT EXPLANTATION
LCSCA & LSA COVERED STENT



Landing in zone 1

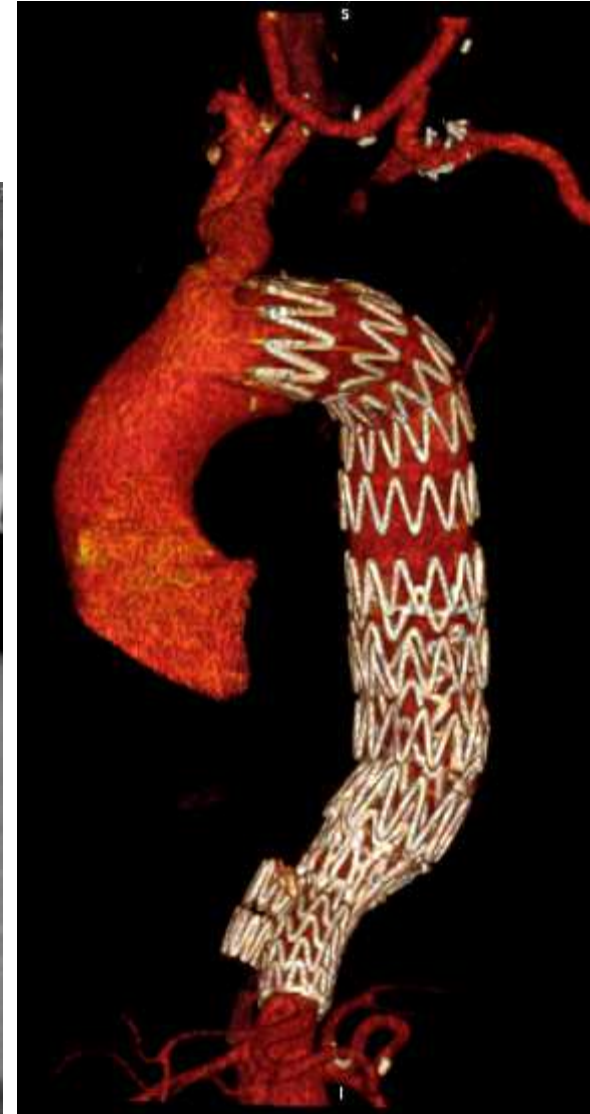
Carotid-carotid bypass

Arm ischemia 3-10%



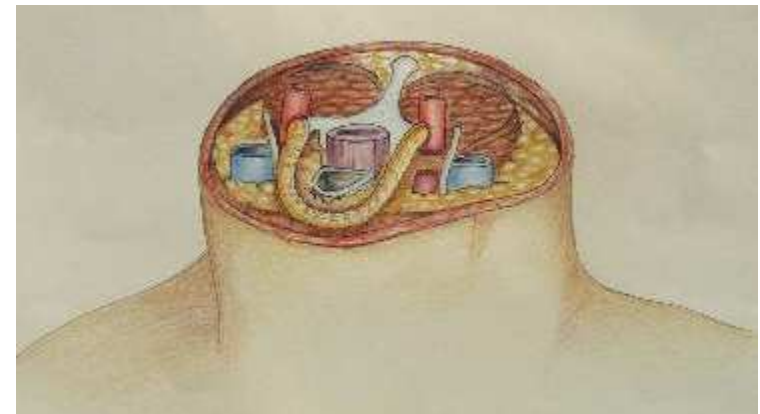
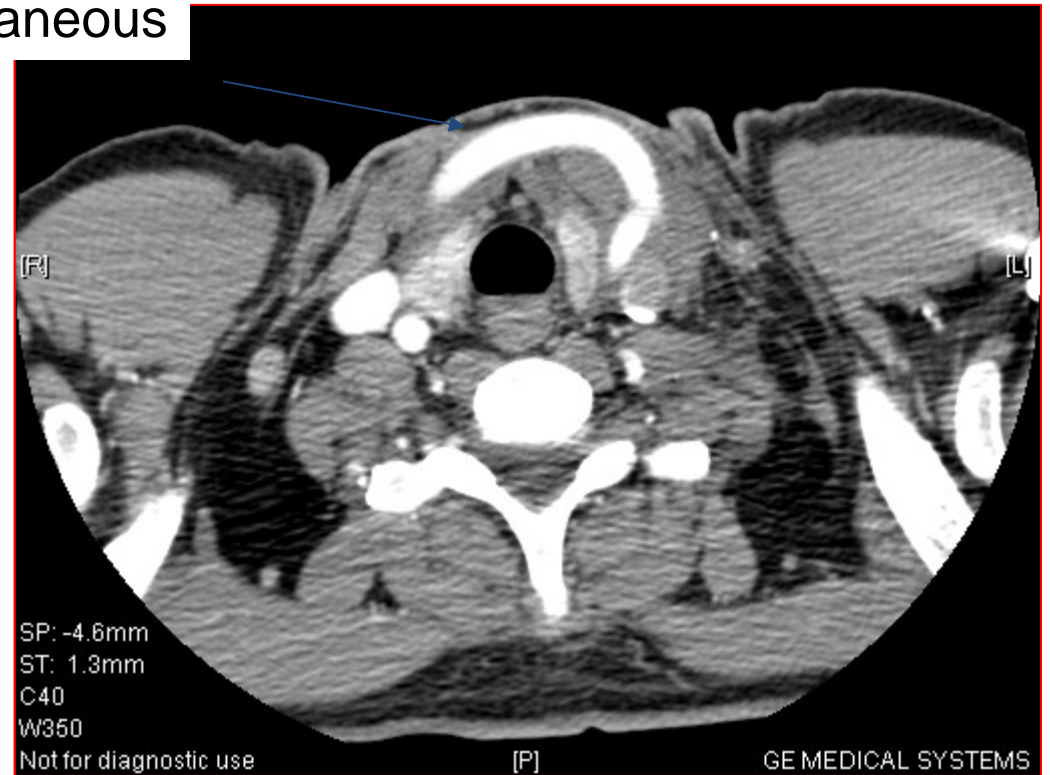
Isolated clamping of one carotid artery is safe without shunt

Secondary LSA byp



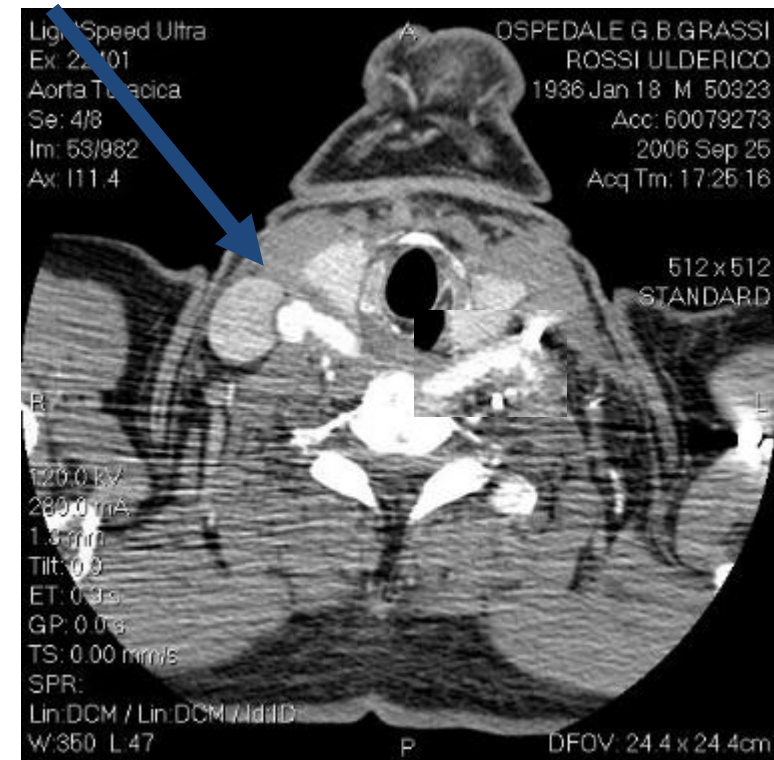
Hemi-arch transposition

Subcutaneous



Hemi-arch transposition

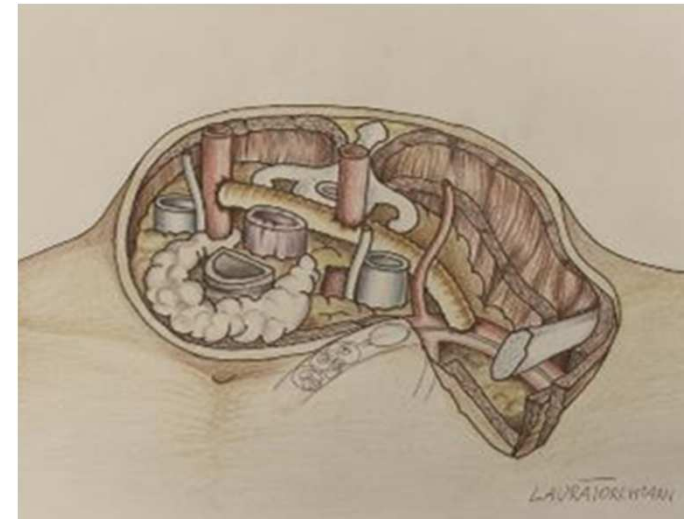
retropharyngeal



Retropharyngeal tunnel

- Shorter bypass
- No compression/bulging of the pharynx (graft = 6 mm)
- Does not interfere with tracheotomy or mid-sternotomy

Our experience	45
Subcutaneous	19
Retroph	26



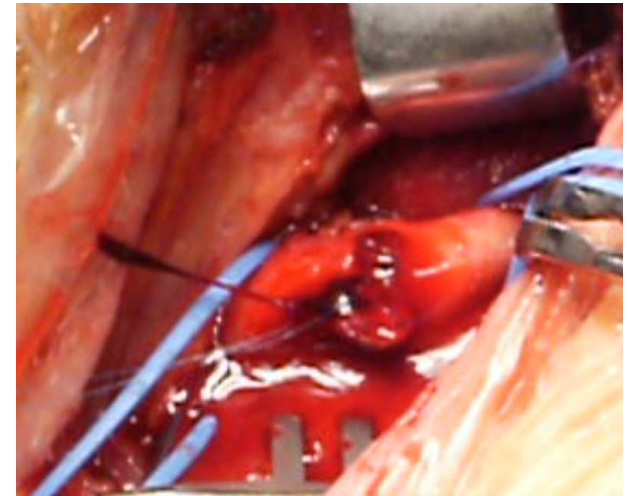
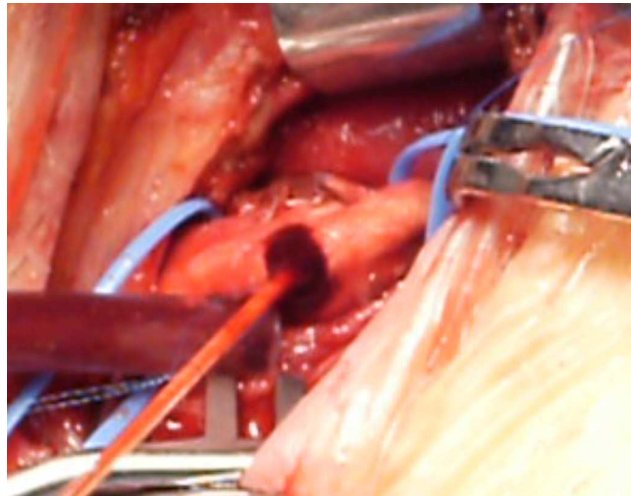
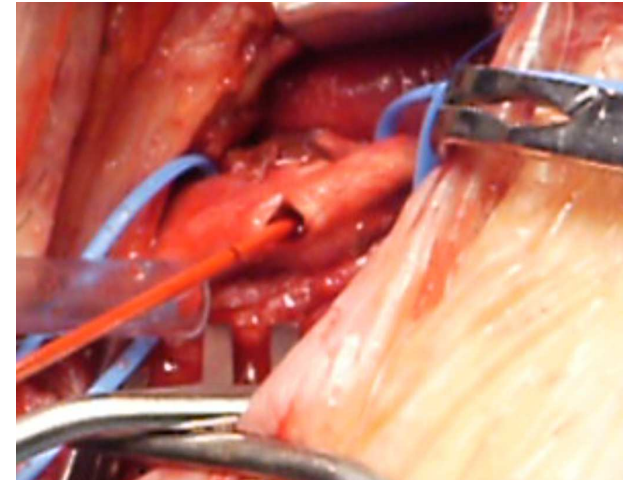
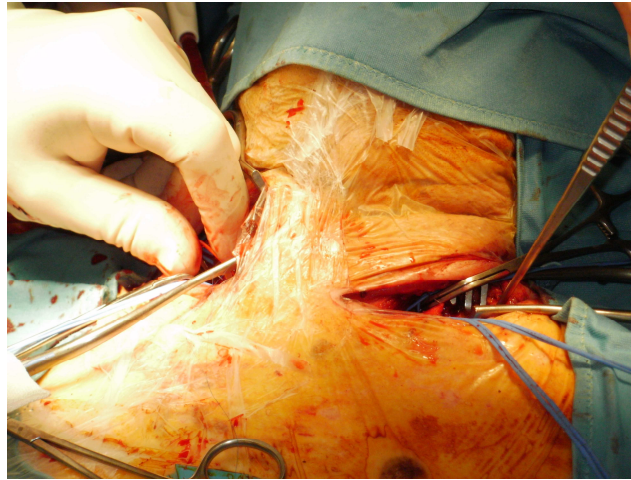
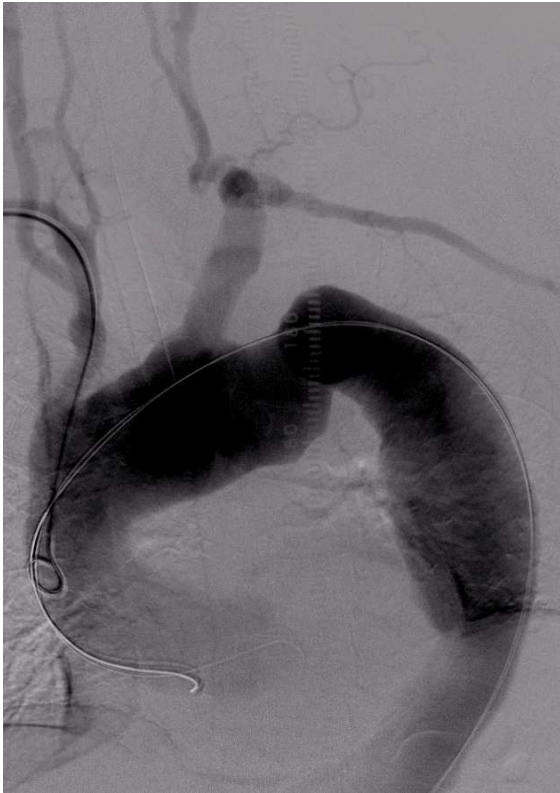
Retropharyngeal route

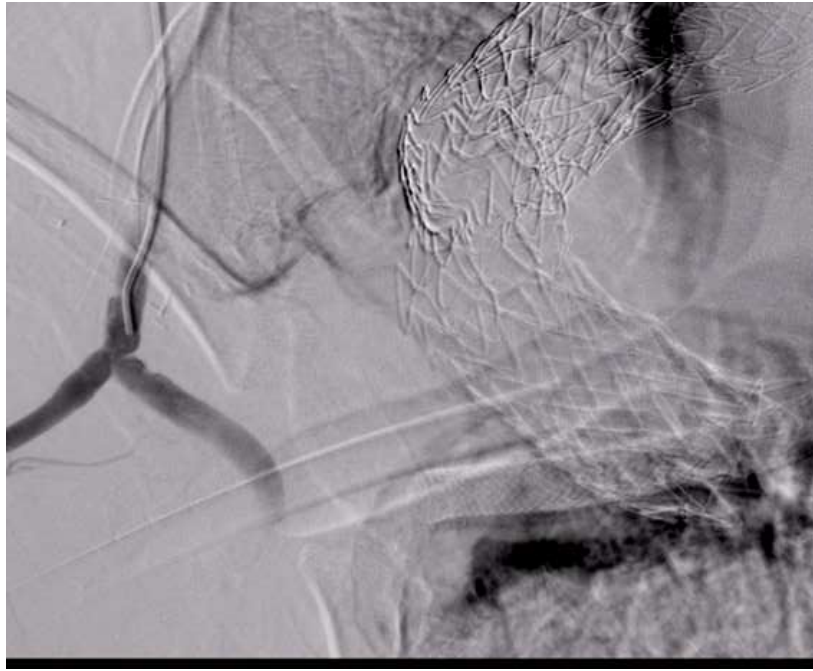
Useful in case of complications



TRACHEOTOMY

2 STEPS → Risk of BP occlus/
avoid competitive flow!!!!!!





2 STEPS → Avoid competitive flow!!!!!! EARLY LSA EMBOLIZATION

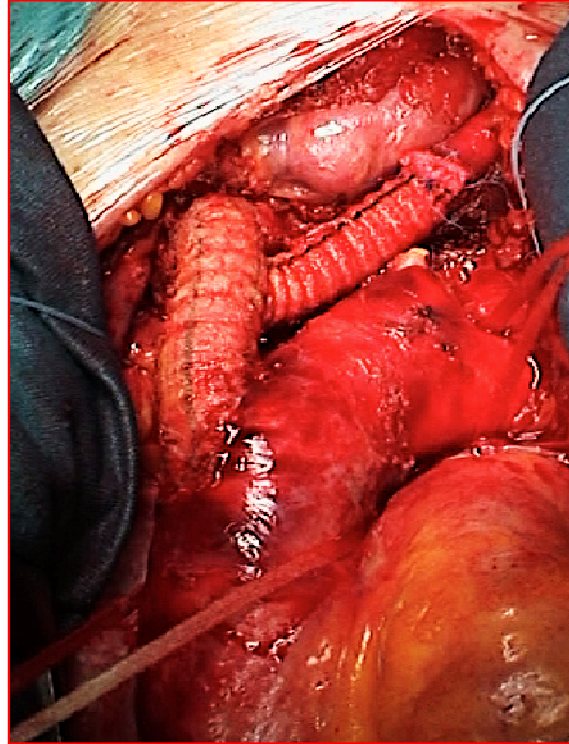
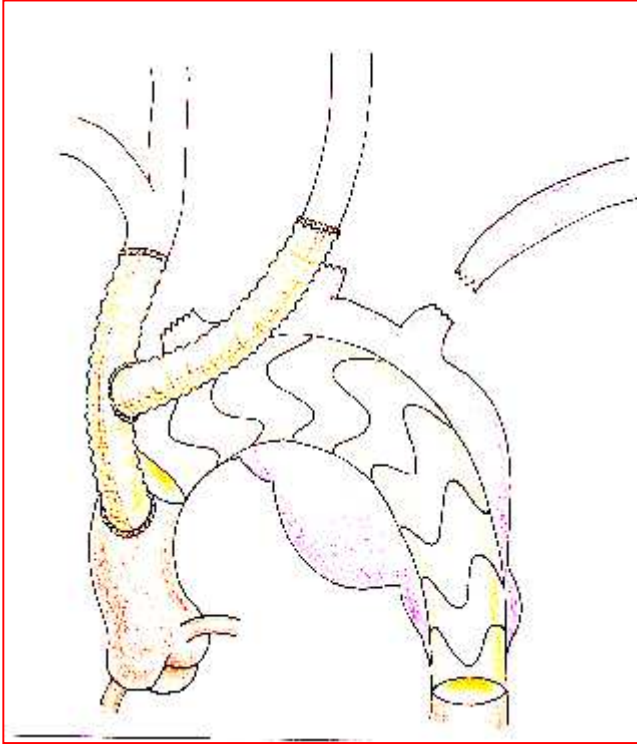
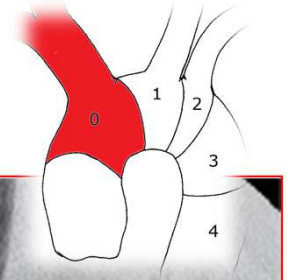


FEMORAL ACCESS



BRACHIAL ACCESS

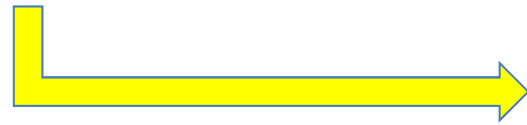
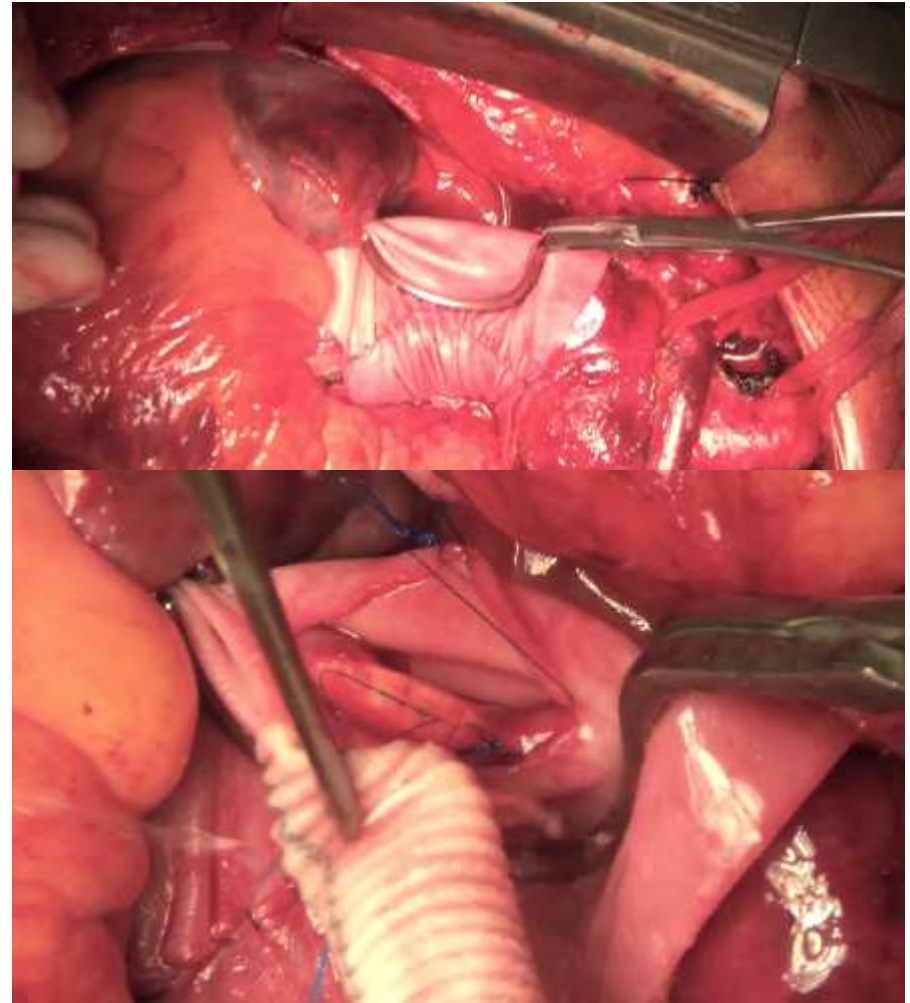
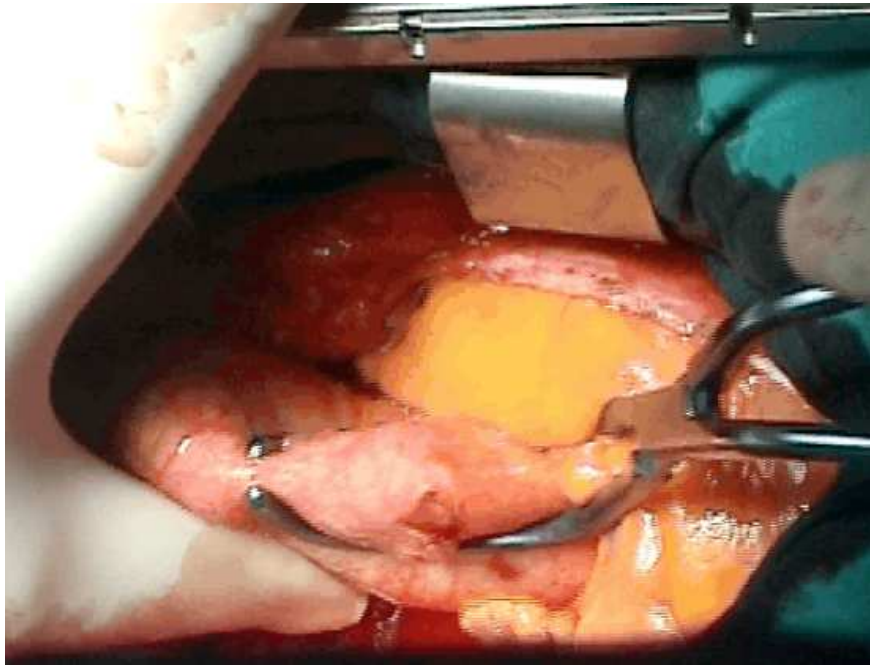
Landing in zone 0



Our experience

retrograde dissection	2/12	16,6%
1 fatal	8,3%	

.... CLAMP RELATED



Change strategy Bovine p. banding

30 days major complications of supraaortic debranching 10/138 pts (7,2%)

- MORTALITY (total debranch) 1/138 (0,7%)
 - Zone 0 8,3%
 - Zone 1-2 0%
- MAJOR COMPLICATIONS 9/138 (6,5%)
 - Bypass occlusion 6/138 (4,3%)
 - Stroke (CHIMNEY ASSOC) 1/138(0.7%)
 - Infection 1/138 (0.7%)
 - Lymphorrhoea (LSA transpos) 1/138 (0.7%)

Immediate minor complications of sopraaortic debranching

21/138 pts (15,2%)

- Neurologic lesions 6/138 (6,5%)
- Haematoma 2/138 (2,1%)
- Brachial lesions 3/138 (3,2%)
(1 obstruction, 1 pseudoaneurysm, 1 av fistula)
- Lymphorrhoea 8/138 (5.7%)
- Disphagia (regressed) 2/26 (7,6%)
(retropharyngeal byp)

Supraaortic debranching

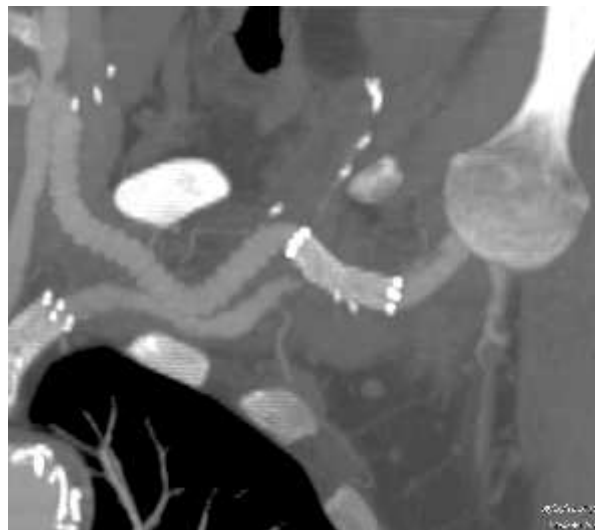
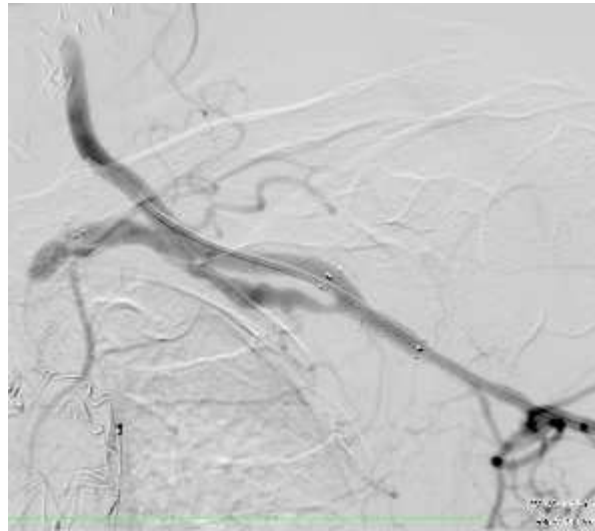
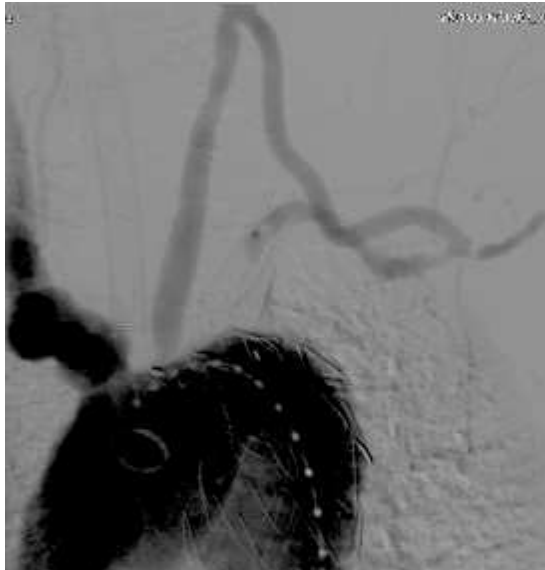
Late results 116/138 pts

follow-up 46 mths (min 2 max 168 mths)

- Mortality 14/116 12% (unrelated)
 - TEVAR related 2
 - Cardiac 2
 - Pulmonary embolism 1
 - Stroke (1 hemorr) 2
- Morbidity 5/116 4,3%
 - Stenosis/occlusions 3 (1 LCCA-LSA untreated)
 - Bypass kinking 1
 - Bypass aneurysm 1

CAR-SUBCL BYPASS

1 ANASTOMOTIC STENOSIS AT 2 MTHS



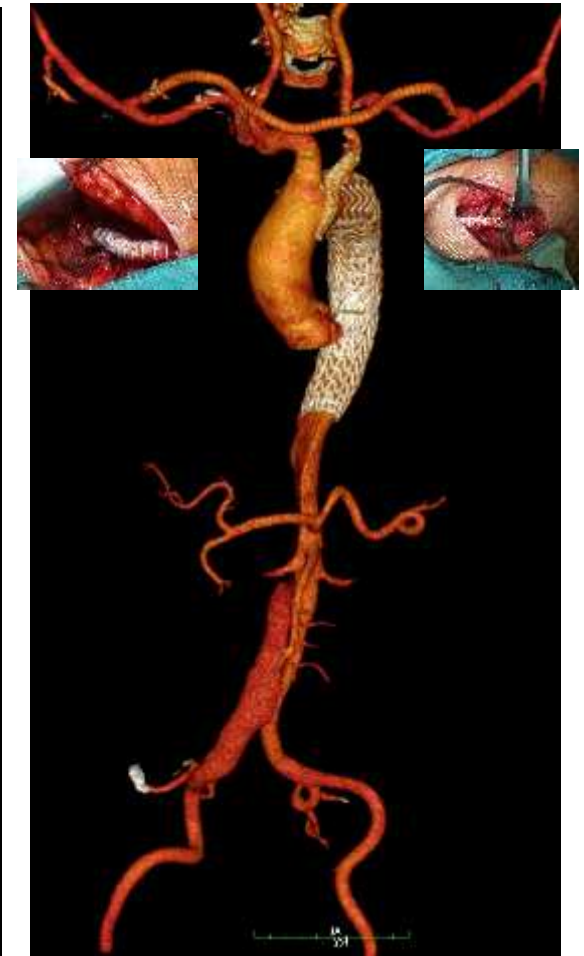
STENTING → ZILVER 7-30

CAR-SUBCL BYPASS 2 OCCLUSION (1 TREATED)

CAR-SUBCL B.

OBSTR AT 3 YRS

AXILLO-AXILL



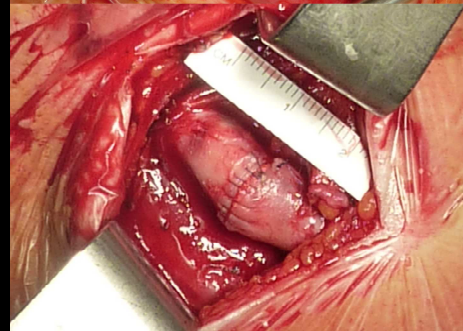
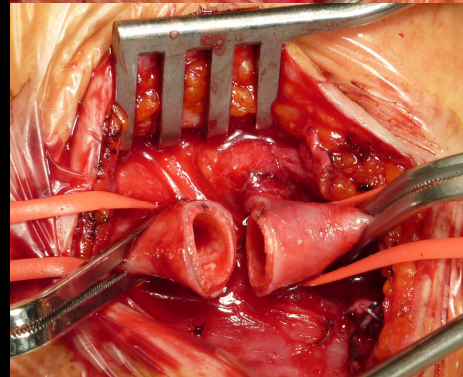
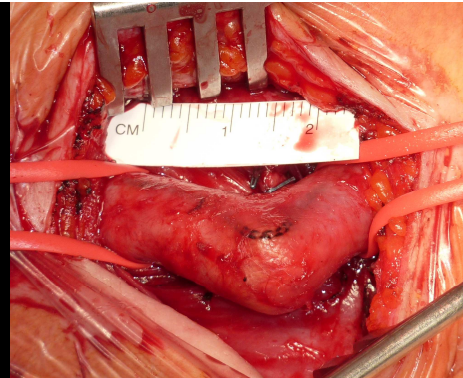
Supraaortic debranching

Late results 116/138 pts

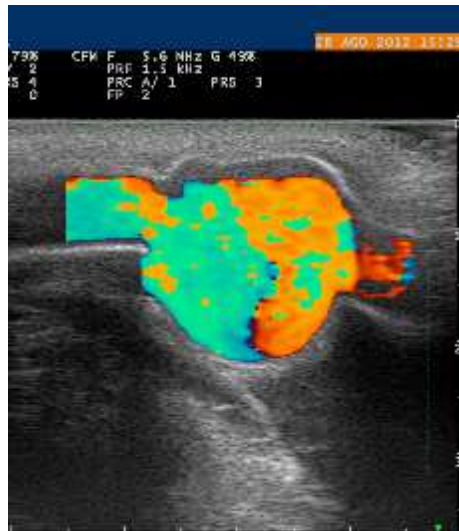
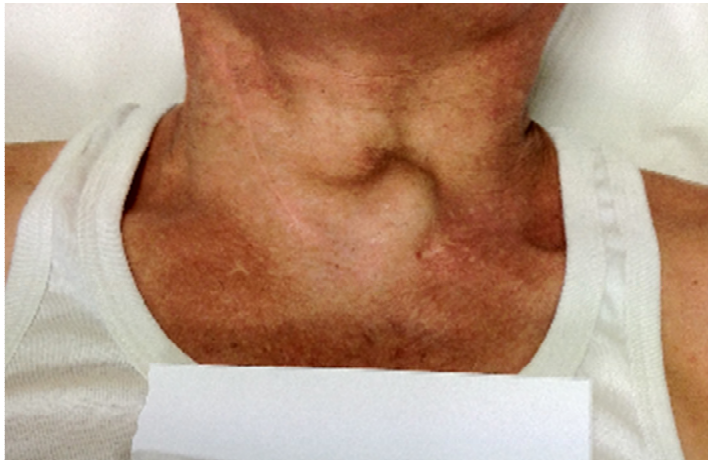
follow-up 46 mths (min 2 max 168 mths)

- Primary patency 97,4%
- Primary assisted patency 98,2%
- Secondary patency 99,1%

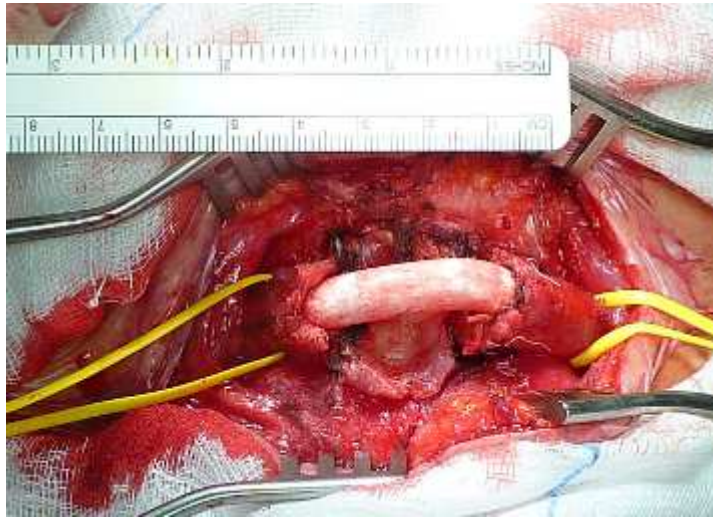
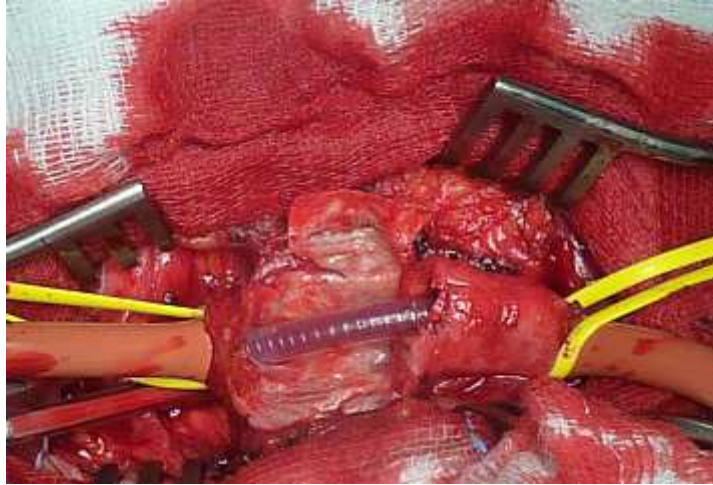
ELONGATIO CAR-CAR subcutaneous bypass (SUBCUTANEOUS) at 5yrs



EMIARCH DEBRANCHING (SUBCUTANEOUS) at 6 yrs + TYPE I B ENDOLEAK



ANEURYSM RESECTION (SHUNT) + DISTAL EXTENSION TEVAR



Conclusions

- Safe procedure
- Long patency
- Best option for pts “unfit for open surgery”

BUT

- Total debranching → “major operations”



- Associated chimney useful in higher risk patients (emiarch vs total deb)