



Università degli Studi di Bari

U.O. DI CHIRURGIA VASCOLARE

CATTEDRA E SCUOLA DI SPECIALIZZAZIONE IN
CHIRURGIA VASCOLARE ed ENDOVASCOLARE

Direttore : PROF. GUIDO REGINA



Gli aneurismi dei vasi sopraaortici - Die Aneurysmen der supraaortalen Gefäße

CHIRURGIA VASCOLARE ED ENDOVASCOLARE



CAROTID AND VERTEBRAL ARTERIES

Sir Astley Cooper 1805

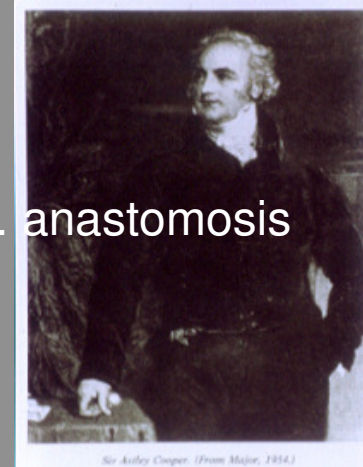
Ligation

Shea P.G. 1955

C.C. → I.C.A. anastomosis

Beall 1959

Prosthetic graft



SUBCLAVIAN ARTERY

Valentine Mott 1818

Ligation

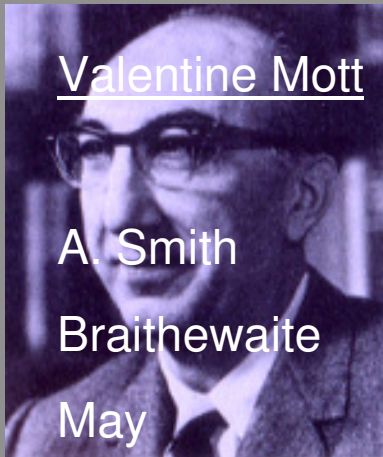
A. Smith 1864

Graft

Braithewaite 1920

May 1993

Stent graft



INNOMINATE ARTERY

Valentine Mott 1818

Kimura 1908

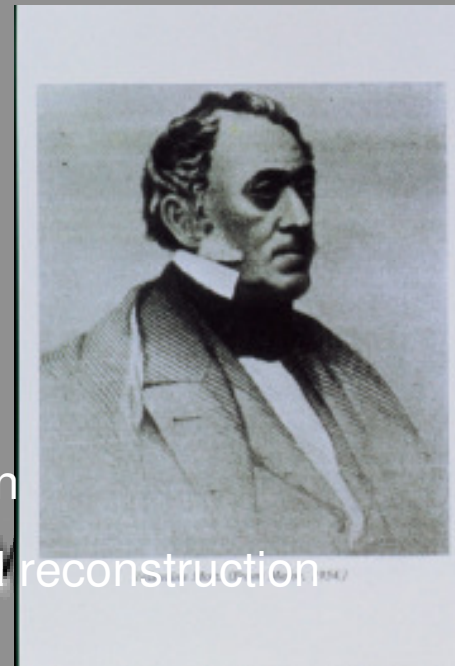
H.T. Banson 1953

M.E. De Bakey 1957

Triple Ligation

First Resection

Resection and reconstruction



SAT ANEURYSMS INCIDENCE in CONNEXION TO ALL PERIPHERAL ARTERIAL ANEURYSM

CAROTID ARTERY

0.4-4%

INNOMINATE ARTERY

1-3%

SUBCLAVIAN ARTERY

1-4%



Our experience:

*Among 3730 SAT reconstructions, until year 2013, only 49 were for
aneurysms*

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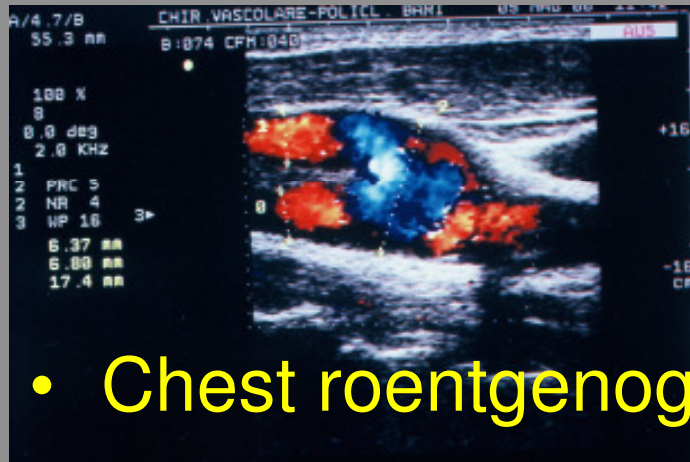
ETIOLOGY

- ATHEROSCLEROSIS
- TRAUMA
- TUBERCOLOSIS
- SYPHILIS
- BACTERIAL ARTERITIS
- MELORHEOSTOSIS
- TUBEROUS SCLEROSIS
- KAWASAKI D.
- Behçet DISEASE
- MARFAN S.
- EHLERS-DANLOS S.
- TAKAYASU
- FIBROMUSCULAR DYSPLASIA
- DISSECTION
- CONGENITAL
- THORACIC OUTLET
- POST ENDOARTERECTOMY
- IATROGENIC
- AIDS

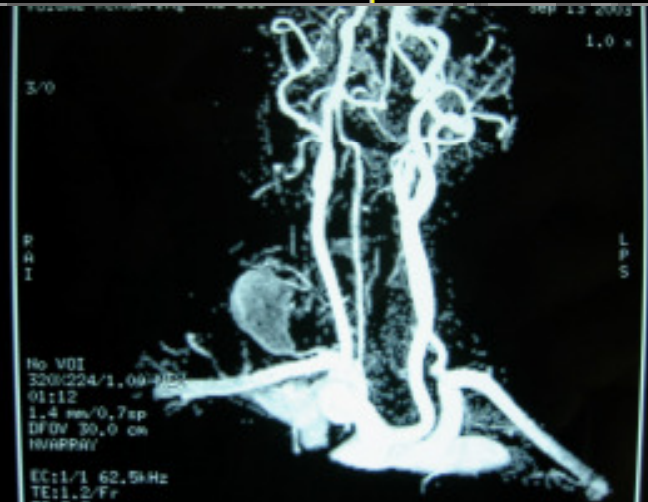
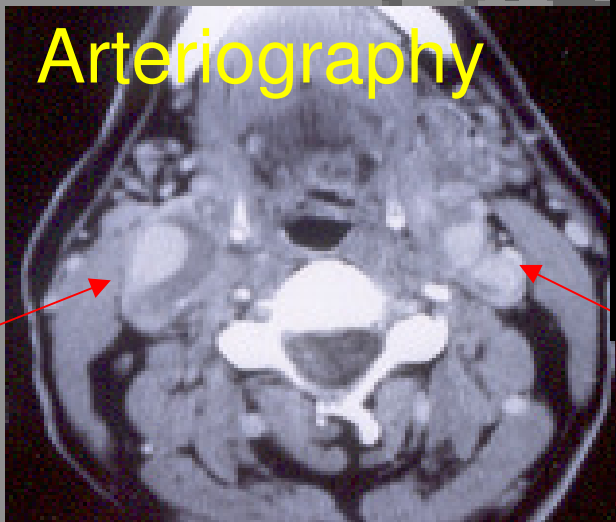
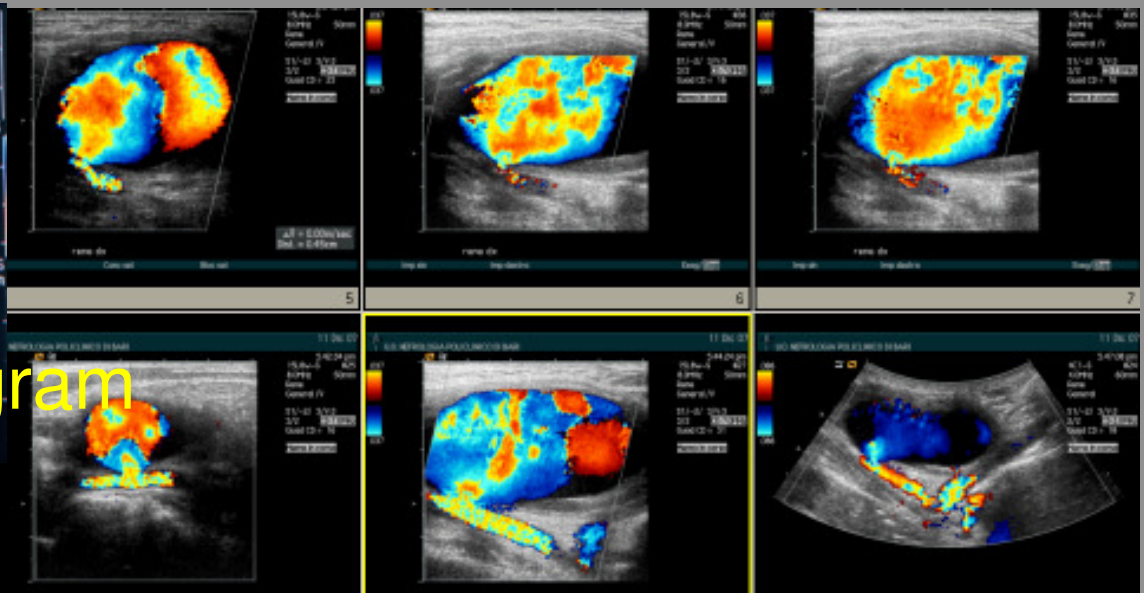
Eur J Vasc Endovasc Surg (2009) 37,

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ANEURYSMS OF THE SAT



- Chest roentgenogram
- Ultrasonography
- Angio CT scan
- Angio MRI
- Arteriography



COLARE ED ENDOW



Chair of Vascular Surgery

University of Bari- Italy

Dir. Prof. Guido Regina

49 operations

48 patients

37 male

11 female

Aneurysmal aspects of
Takayasu Arteritis . Our
Experience 1998



Mean age 55 years
(range 16-73)

Treatment of SAT aneurysm: Report of 16 cases Chir
Ital 1999

Aneurysms of the
supra-aortic trunks in
Takayasu's disease.
Report of two cases
1998

Il trattamento in urgenza degli aneurismi
dei tronchi sovraortici
e della carotide interna

Ann. Ital. Chir., LXXI, 4, 2000

Journal of
Vascular Surgery

Regarding extracranial carotid
artery aneurysms in
Takayasu disease 2000

PRESENTATION

Symptoms and signs

n. patients

Neurological (TIA-Stroke)

11

Upper extremity ischemia

2

Neurological and upper extremity
ischemia

1

Compression syndromes

4

Septicemia

1

Systolic bruits

10

Pusatile mass

16

Location

10 carotid; 1 subclavian;
1 innominate

2 subclavian

1 subclavian

1 innominate; 3 carotid
carotid

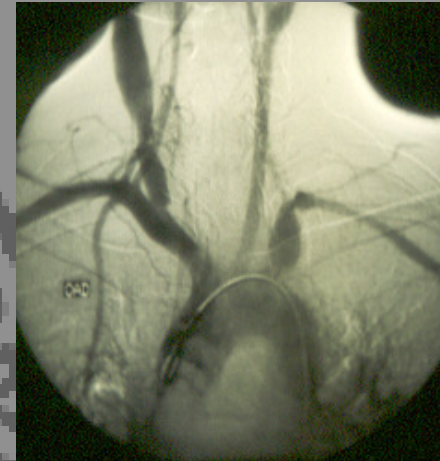
8 carotid; 2 subclavian

13 carotid; 2 subclavian
1 Vertebral

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EXTRACRANIAL CAROTID ARTERY ANEURYSMS ETIOLOGY

• ATHEROSCLEROSIS	12
• FIBROMUSCULAR DYSPLASIA	3
• MYCOSIS	2
• TAKAYASU	3
• DISSECTION	6
<i>Total</i>	<i>26</i>



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CAROTID ARTERY ANEURYSMS

Surgical technique

FUSIFORM ANEURYSMS

CCA

INTERPOSITION GRAFT

VEIN

DACRON

PTFE

PROXIMAL BIFURCATION :

- INTERPOSITION GRAFT + REIMPL. OF THE ECA;

PROXIMAL CERVICAL ICA :

PROXIMAL ICA

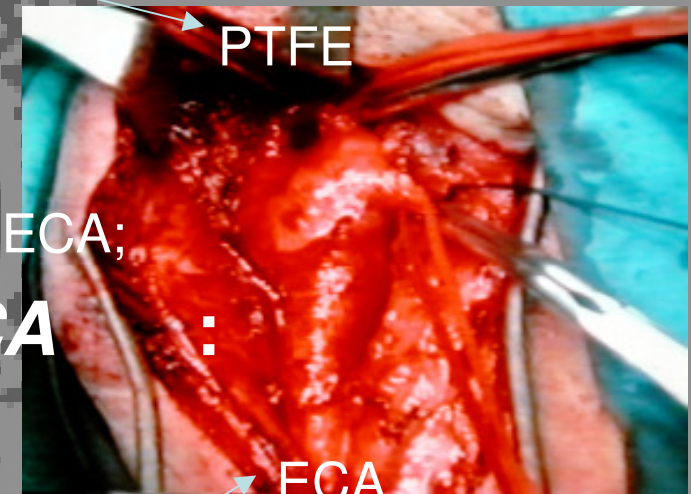
RESECTION AND DIRECT TRANSPOSITION to the

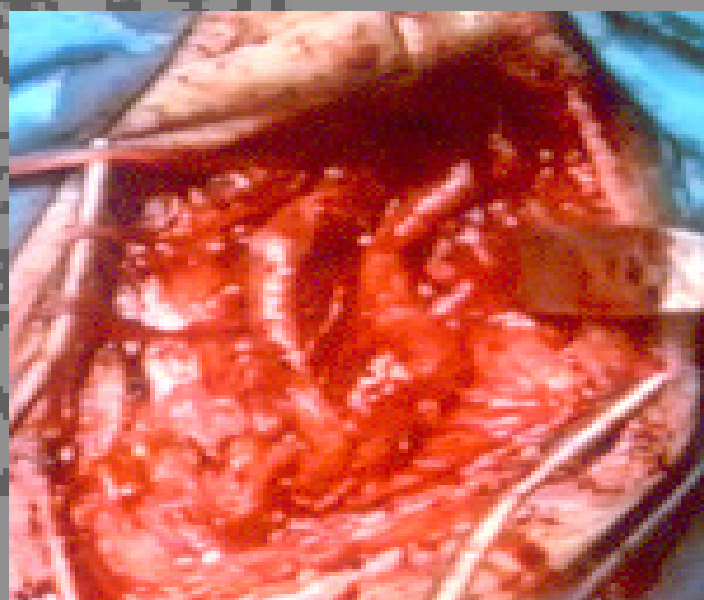
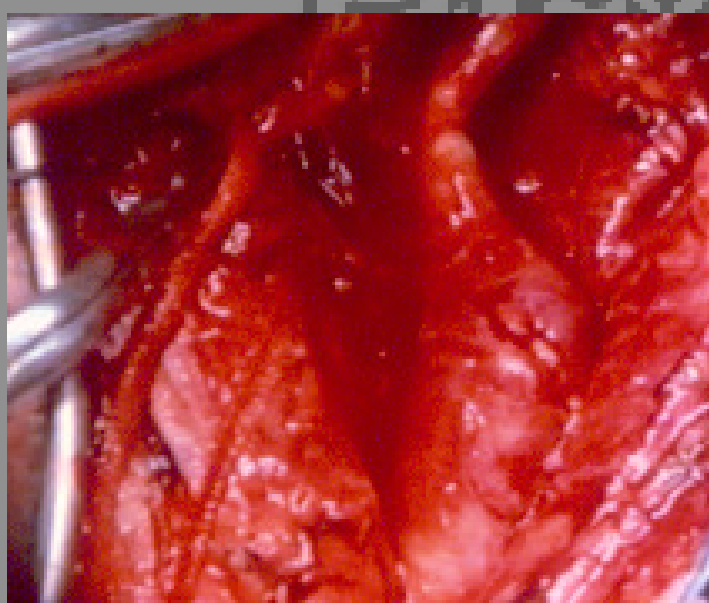
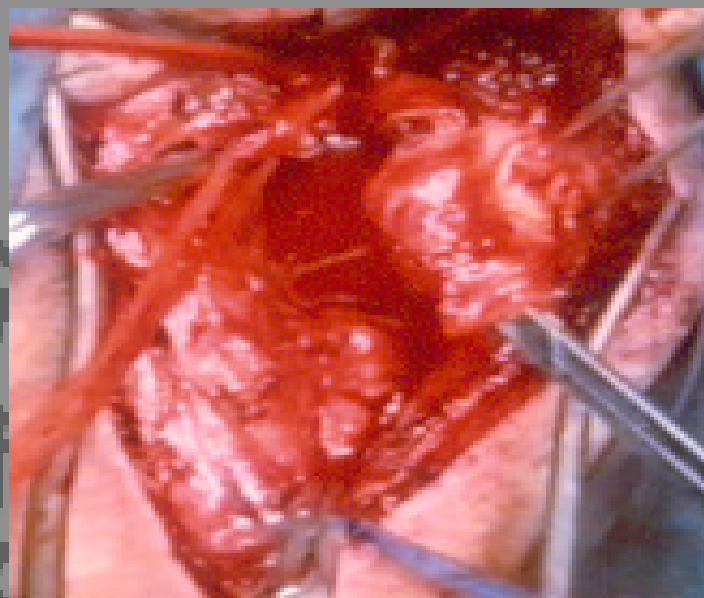
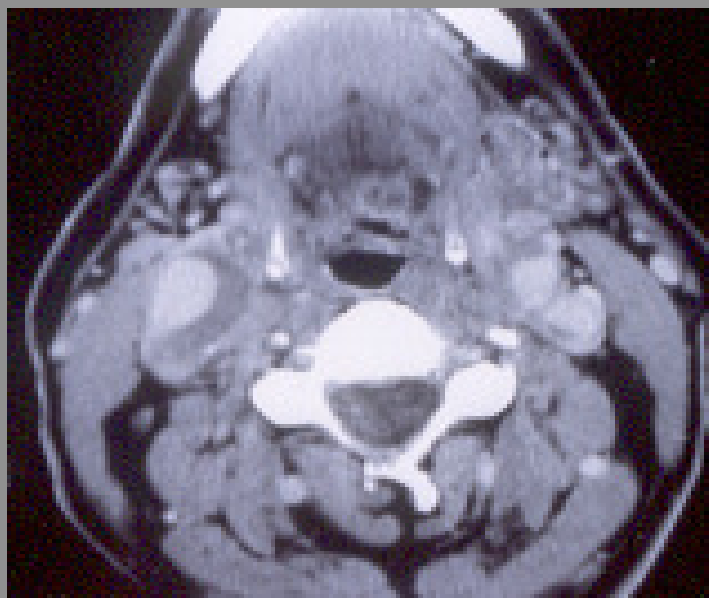
ECA

CCA

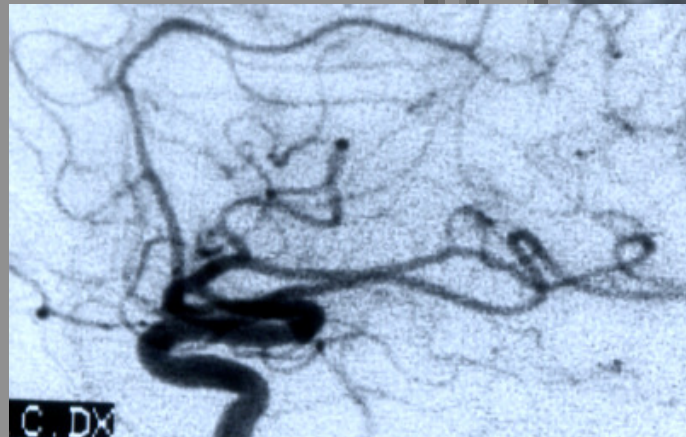
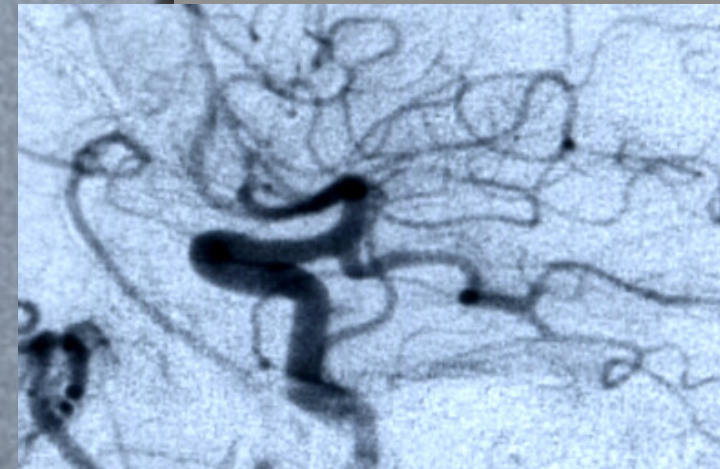
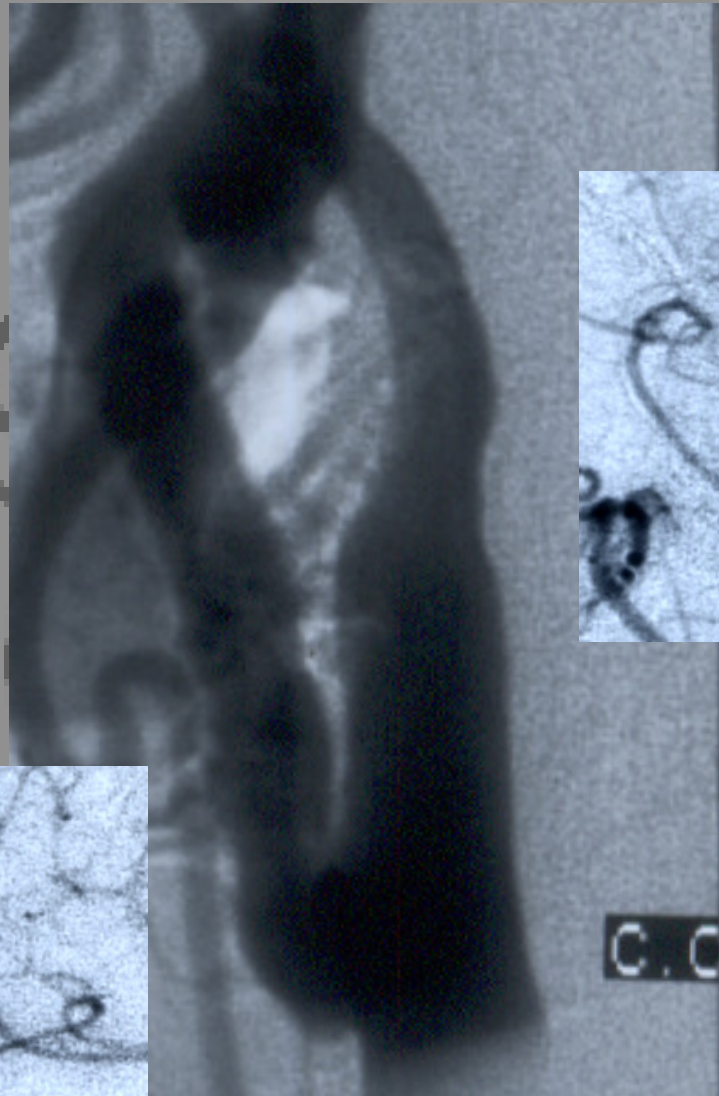
DISTAL CERVICAL ICA :

PROXIMAL LIG.; BALLOON OCCL. VEIN GRAFT





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C. C

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CAROTID ARTERY ANEURYSMS

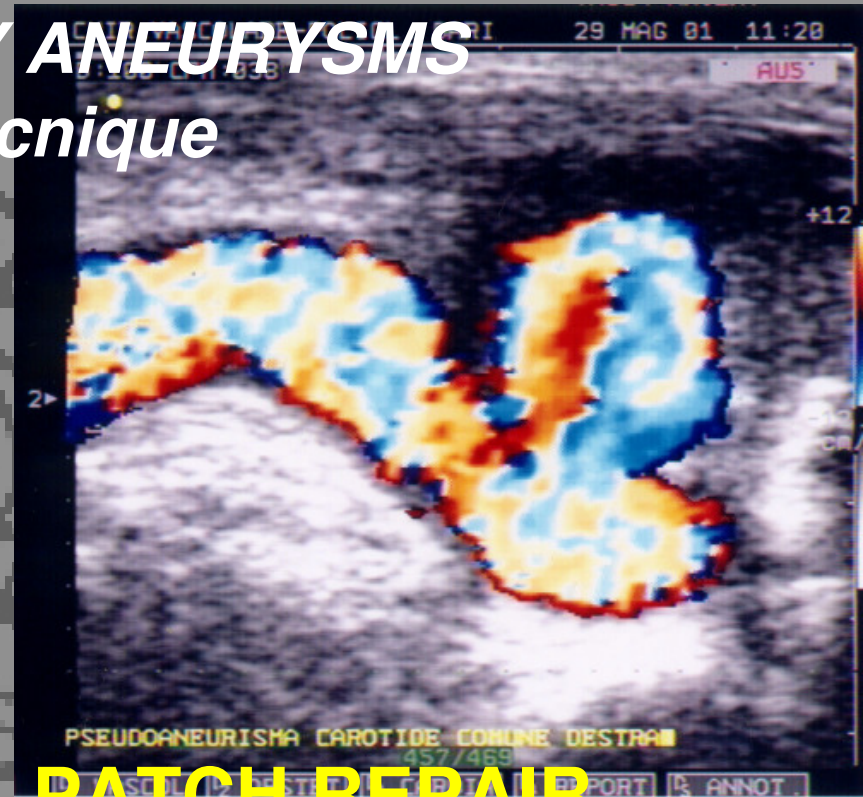
Surgical technique

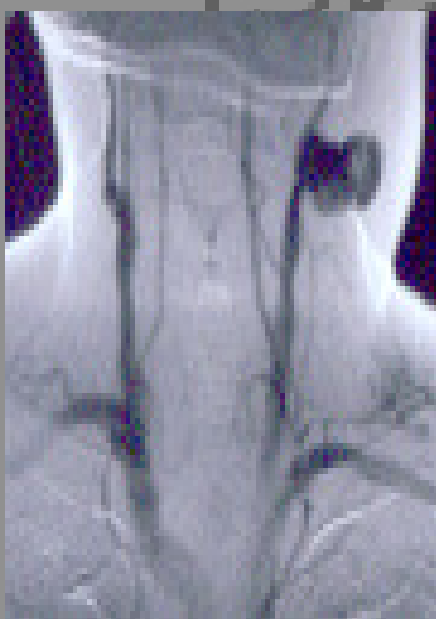
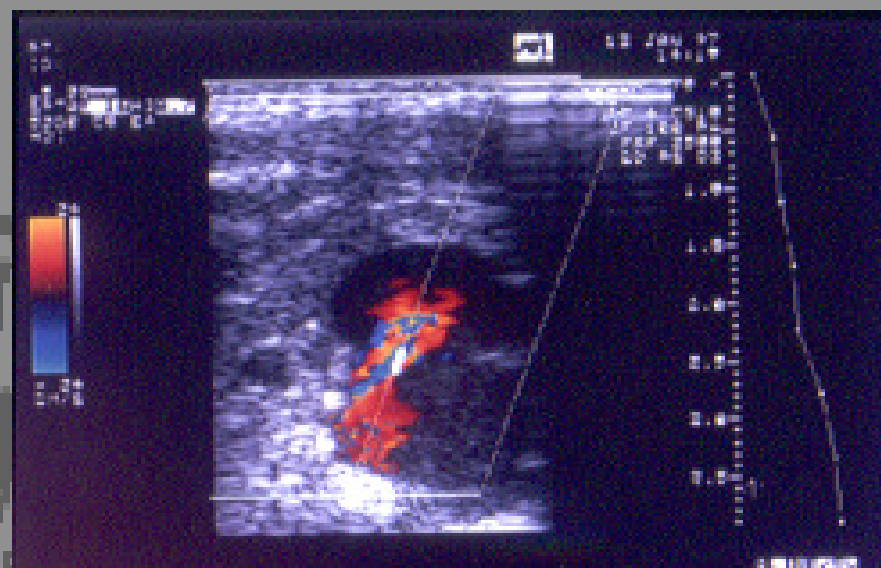
SACCULAR ANEURYSMS

**EXCISION AND LATERAL PATCH REPAIR
GRAFT – TRANSPOSITION**

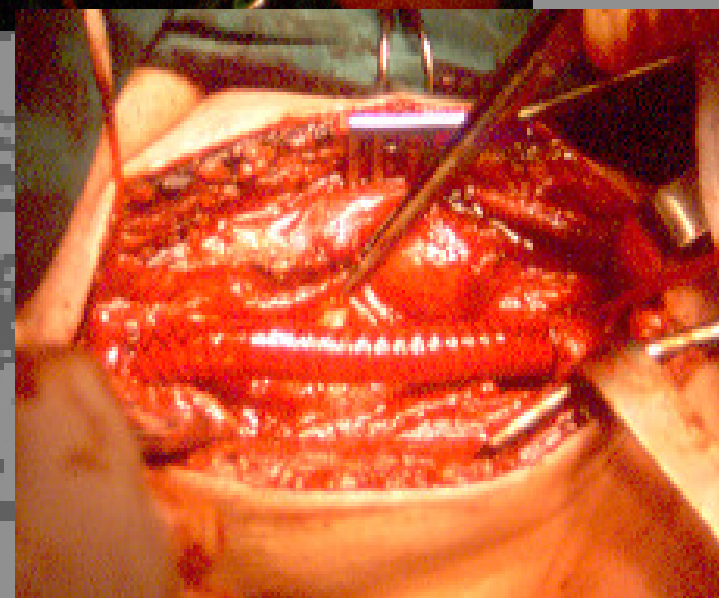
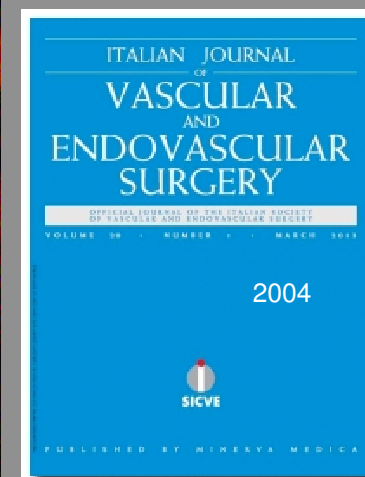
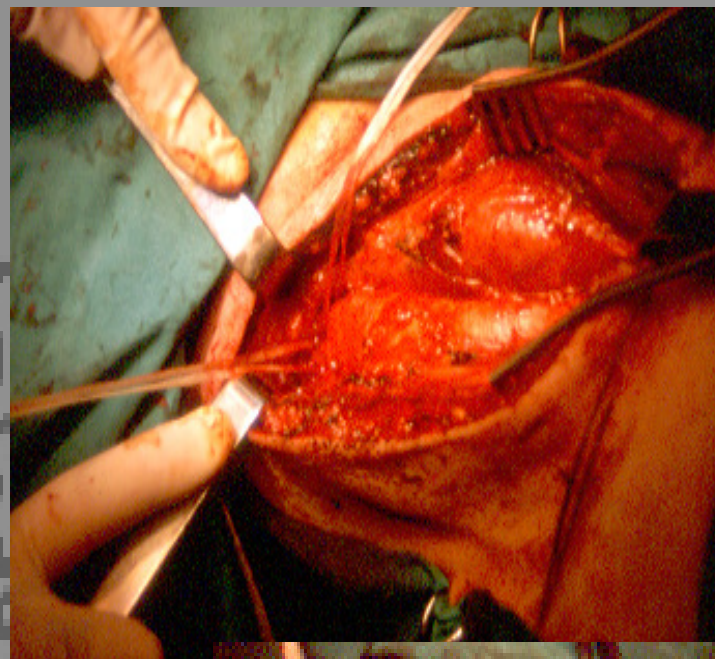
ENDOVASCULAR PROCEDURES

CHIRURGIA VASCOLARE ED ENDOVASCOLARE





CHIRURGIA VASCOLARE ED ENDOVASCOLARE

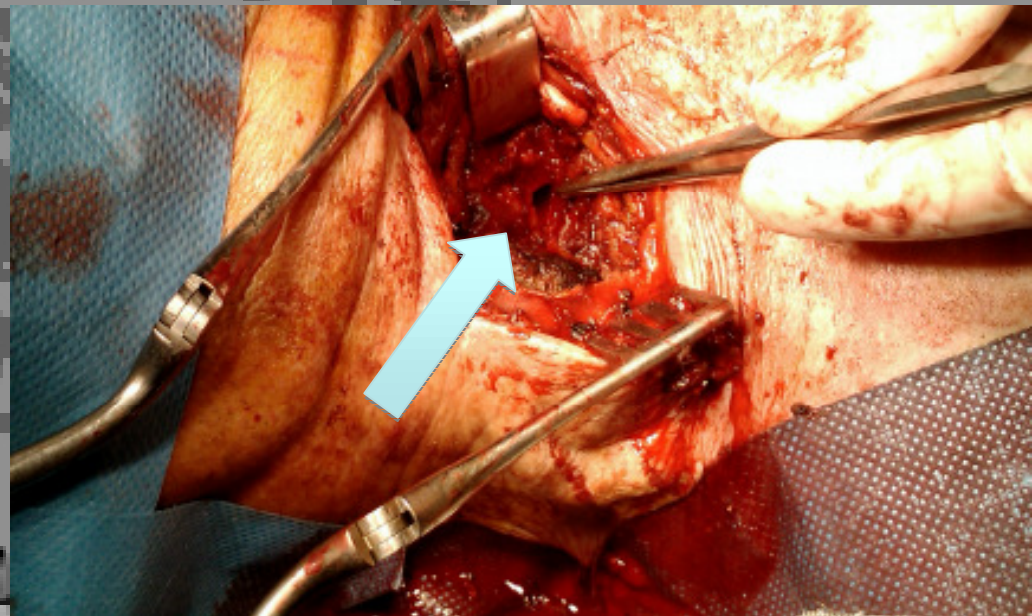


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Post traumatic CCA pseudoaneurysm



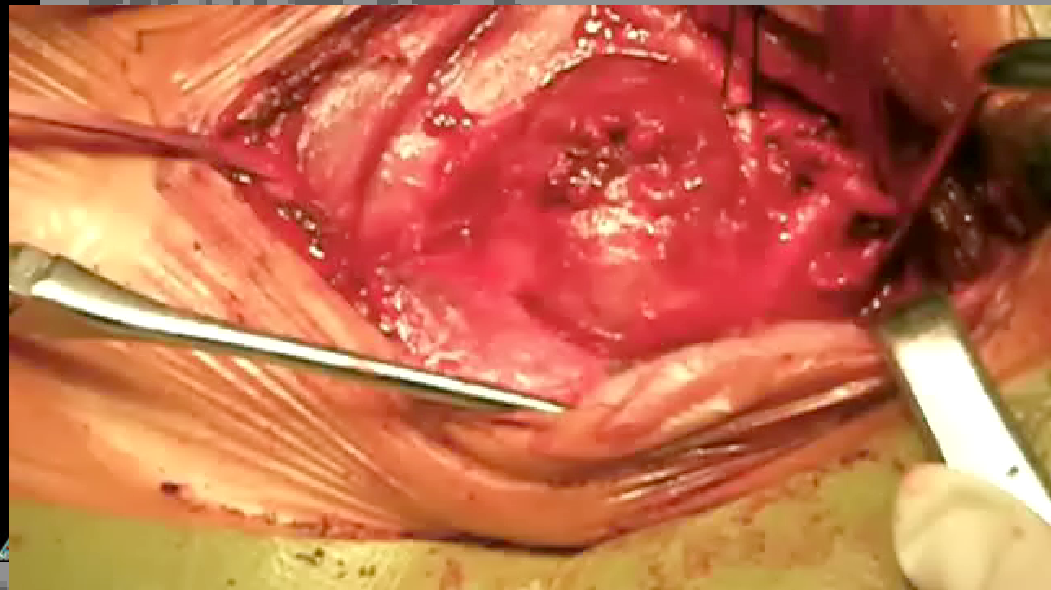
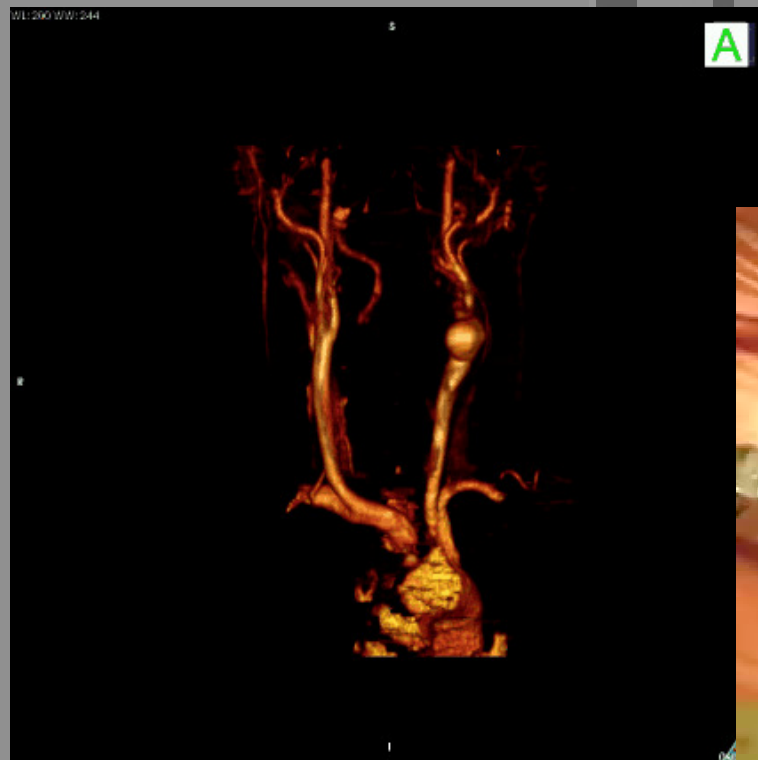
Viabahn 10 mm x 5cm



CHIRURGIA VASCOL

CCA aneurysm

PTFE GRAFT



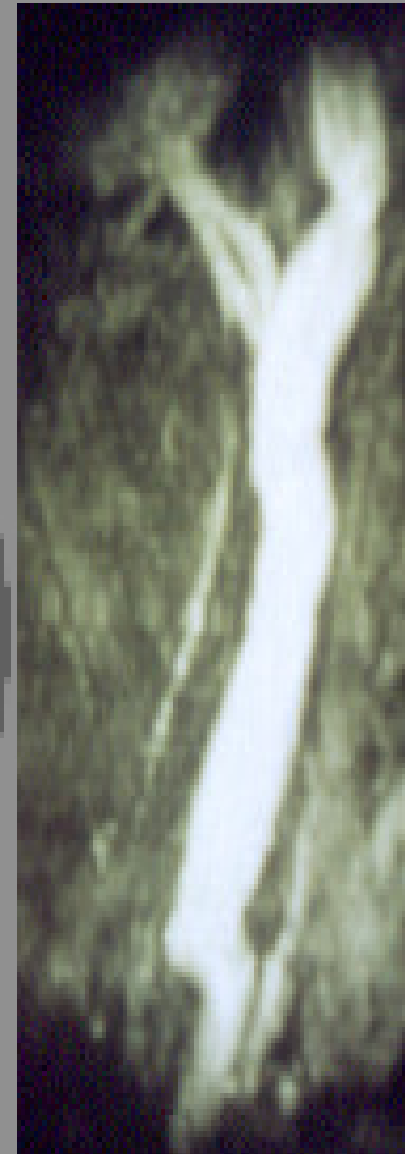
CHIRURGIA VASCOLARE ED ENDOVASCOLARE



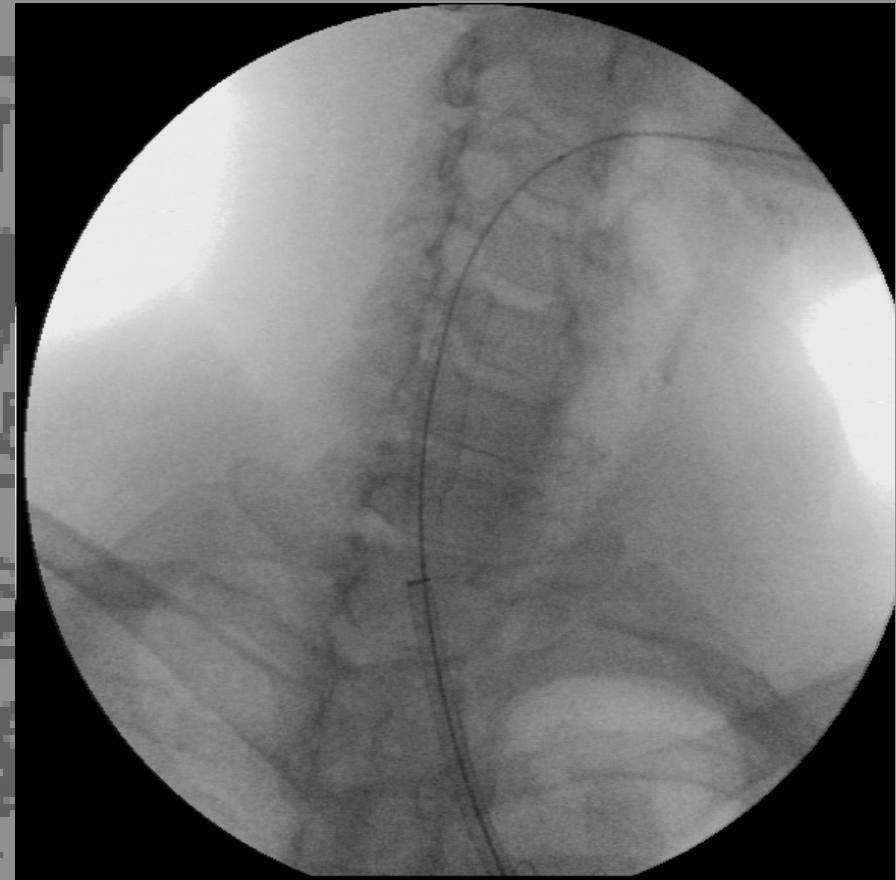
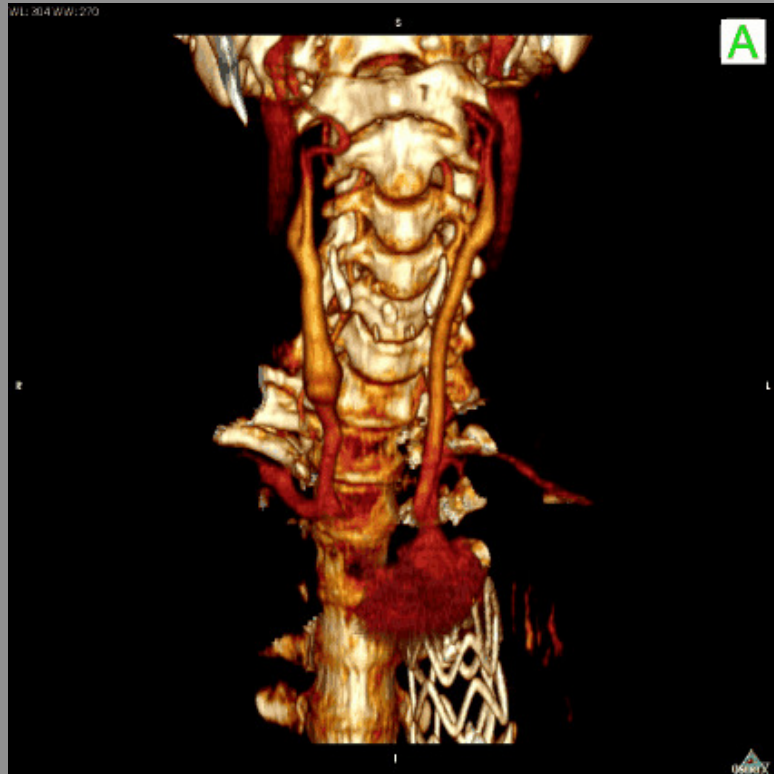
TAKAYASU DISEASE



ANASTOMOTIC
ANEURYSM



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Viabahn 9 mm x 5cm

Takayasu arteritis

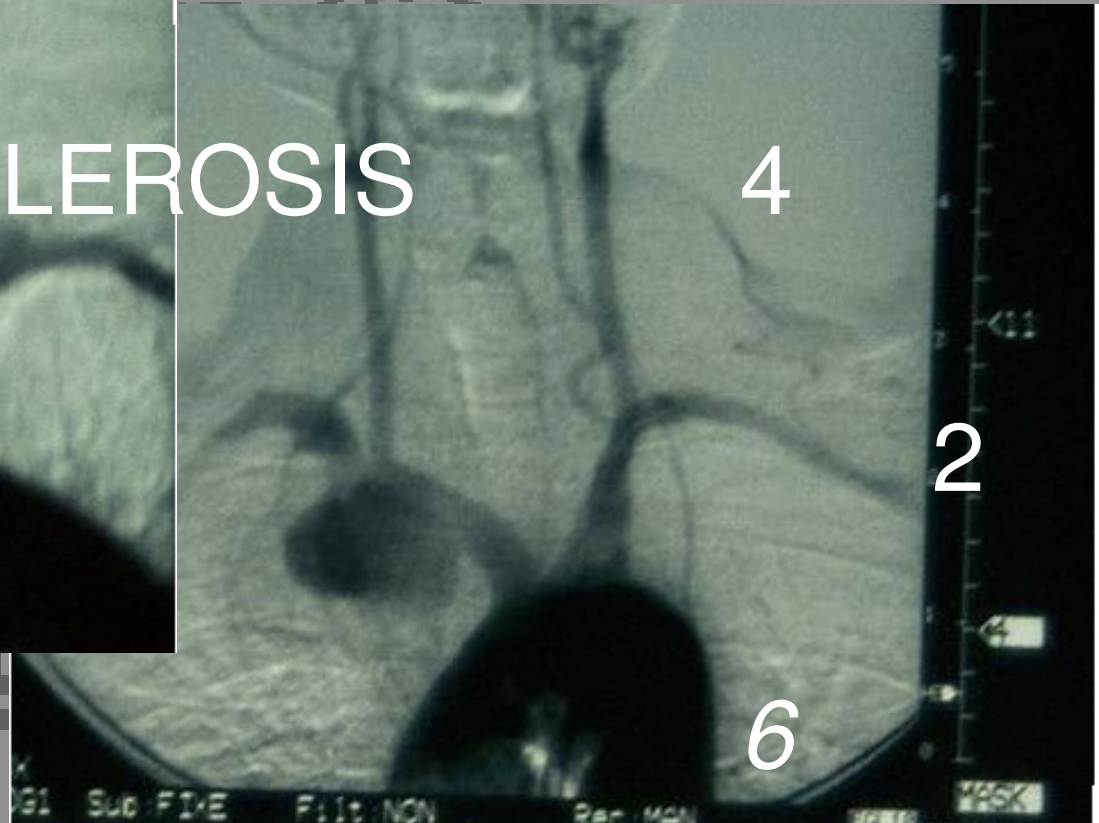
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INNOMINATE ARTERY ANEURYSMS

ETIOLOGY

- ATHEROSCLEROSIS
- TAKAYASU

Total



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INNOMINATE ARTERY ANEURYSMS

Surgical technique

Repair of the aneurysms involving the arch

- PATCH CLOSURE AND BY PASS FROM THE AORTA
- TUBE GRAFT WITH INTERPOSITION GRAFT
- TUBE GRAFT AND BY PASS FROM THE AORTA
(with deep hypothermia and circulatory arrest or partial circulatory by pass)
- PATCH CLOSURE WITH INTERPOSITION GRAFT
- **ENDOVASCULAR TREATMENT**



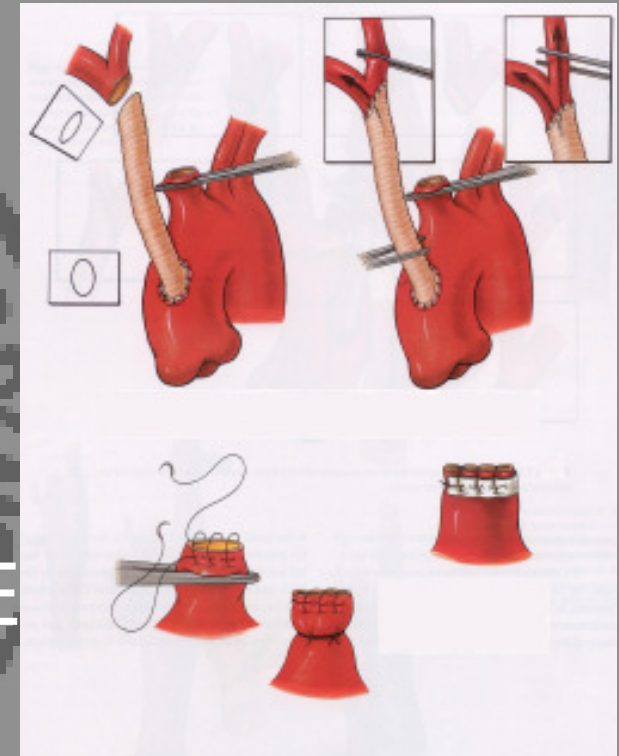
CHIRURGIA VASCOLARE ED ENDOVASCOLARE

INNOMINATE ARTERY ANEURYSMS

Surgical technique

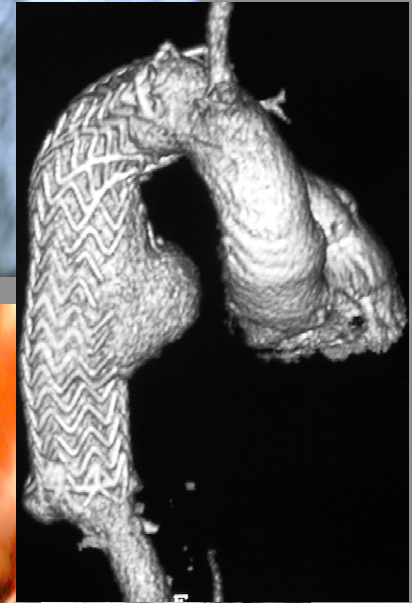
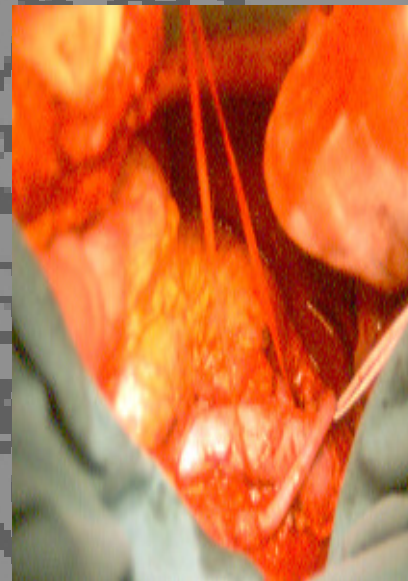
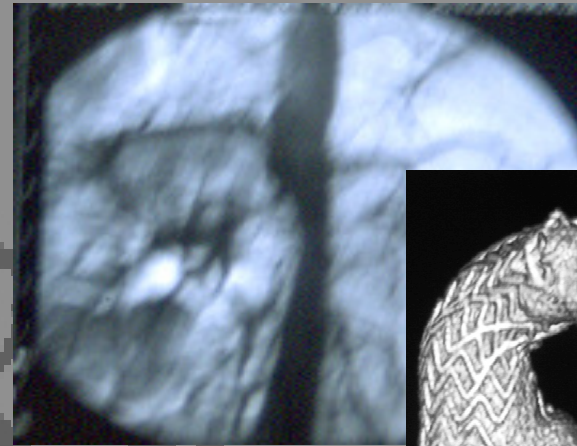
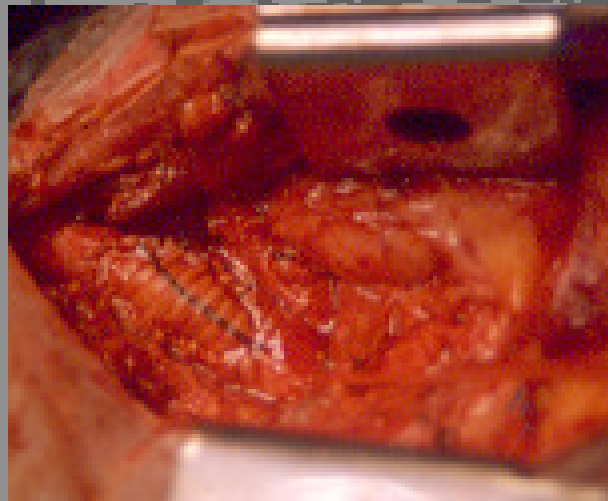
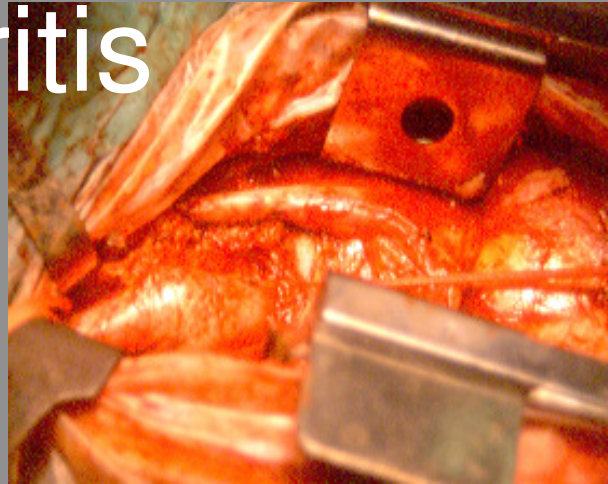
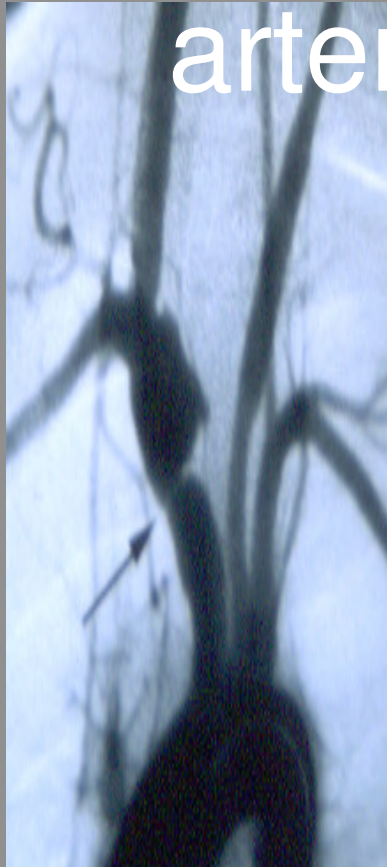
Medial sternotomy

- INTERPOSITION GRAFT
- BY PASS GRAFT FROM THE ASCENDING AORTA
(with lateral closure of the aortotomy)

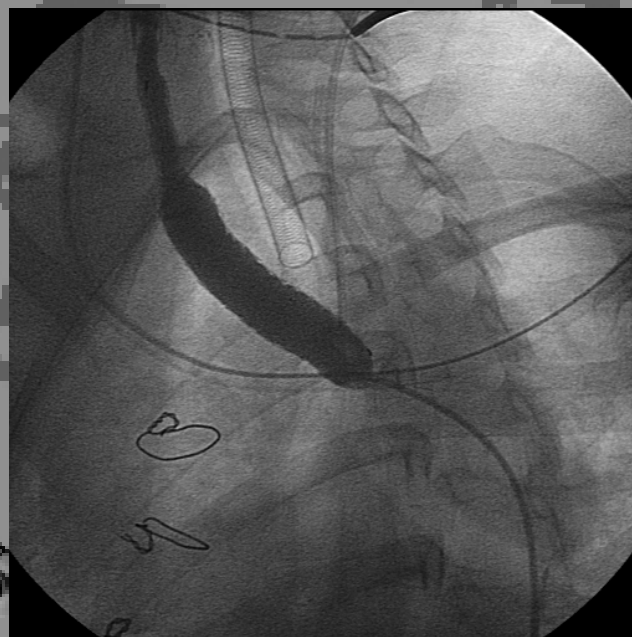
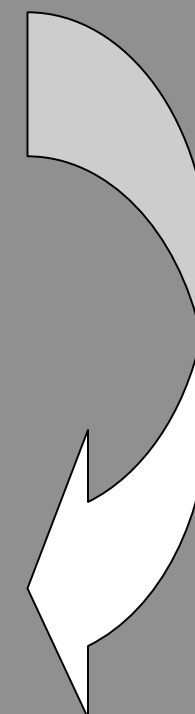
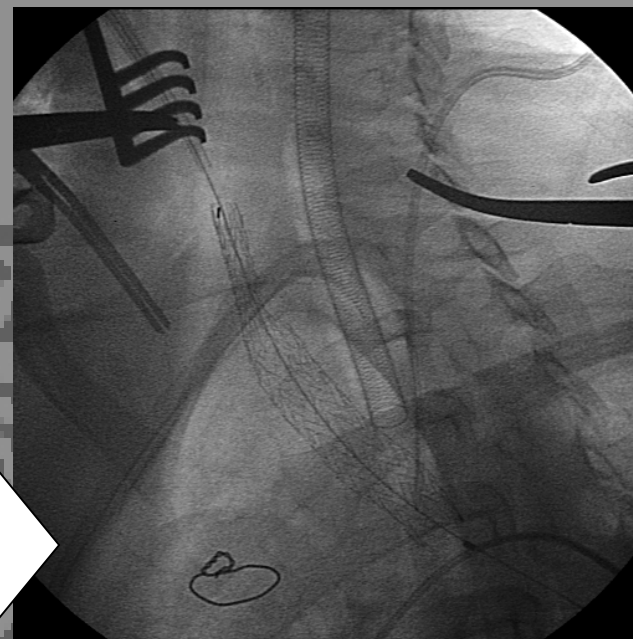
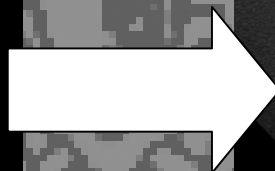


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Takayasu arteritis



CHIRURGIA VASCOLARE ED ENDOVASCOLARE

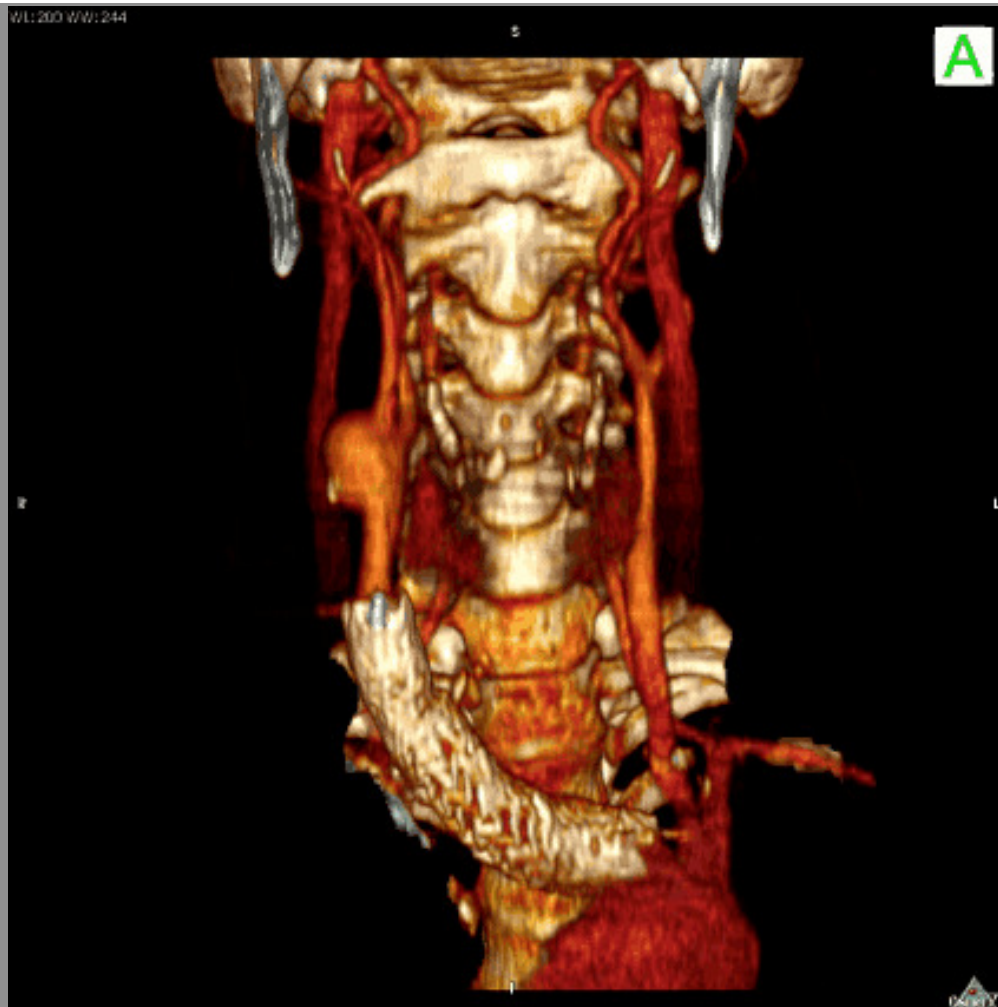


TAKAYASU
ARTERITIS

(Gore 1614100 2003)

CHIRURGIA VAS

OVASCOLARE



Takayasu arteritis 2011



Conservative management : mortality
rate 71%

J Cardiovasc Surg 1997; 38: 27 – 31.

Journal of
Vascular Surgery® 2012

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SUBCLAVIAN ARTERY ANEURYSMS

ETIOLOGY

Intrathoracic

- ATHEROSCLEROSIS
- TAKAYASU

Total

6

1

7

Extrathoracic

- ATHEROSCLEROSIS
- FIBROMUSCULAR DYSPLASIA

Total

9

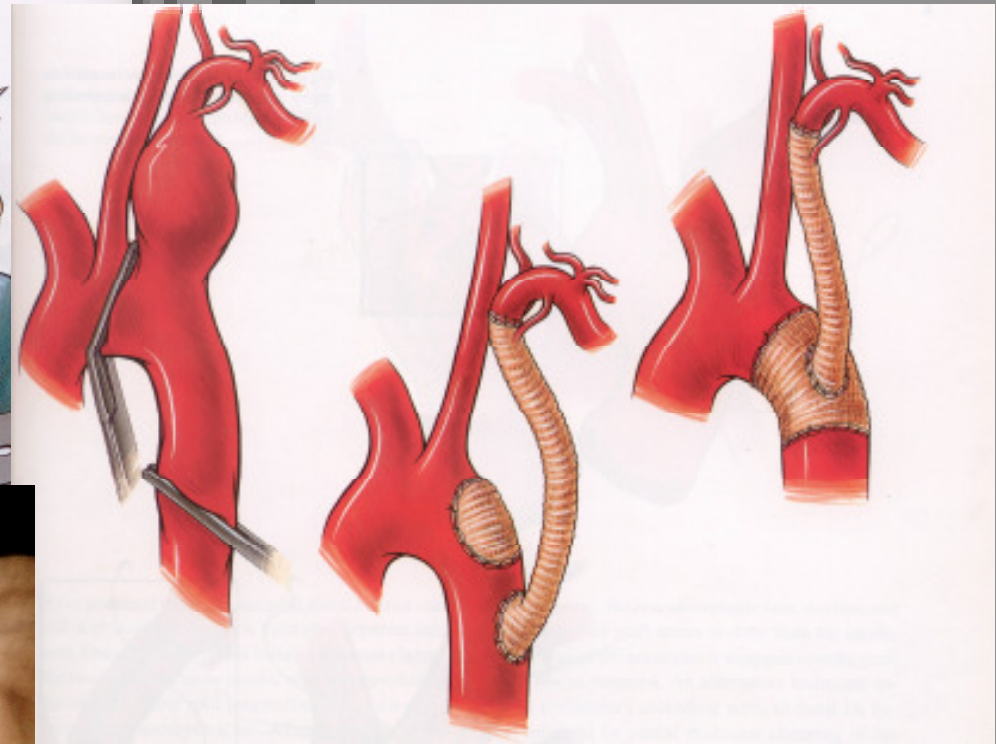
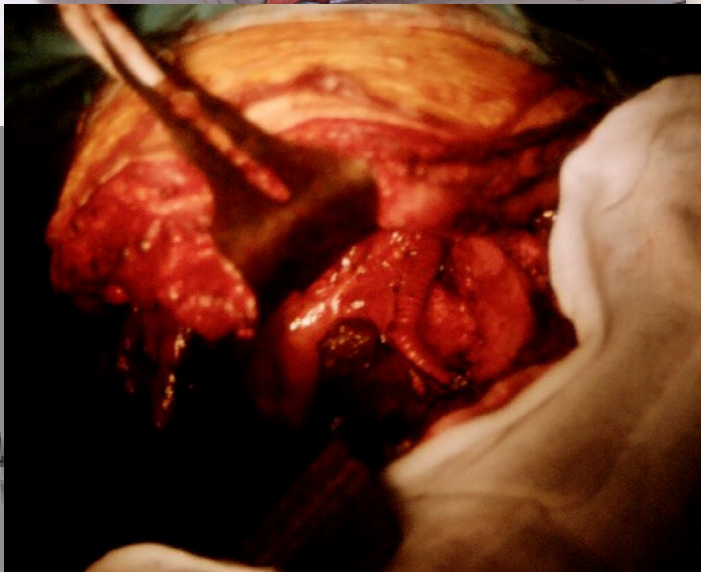
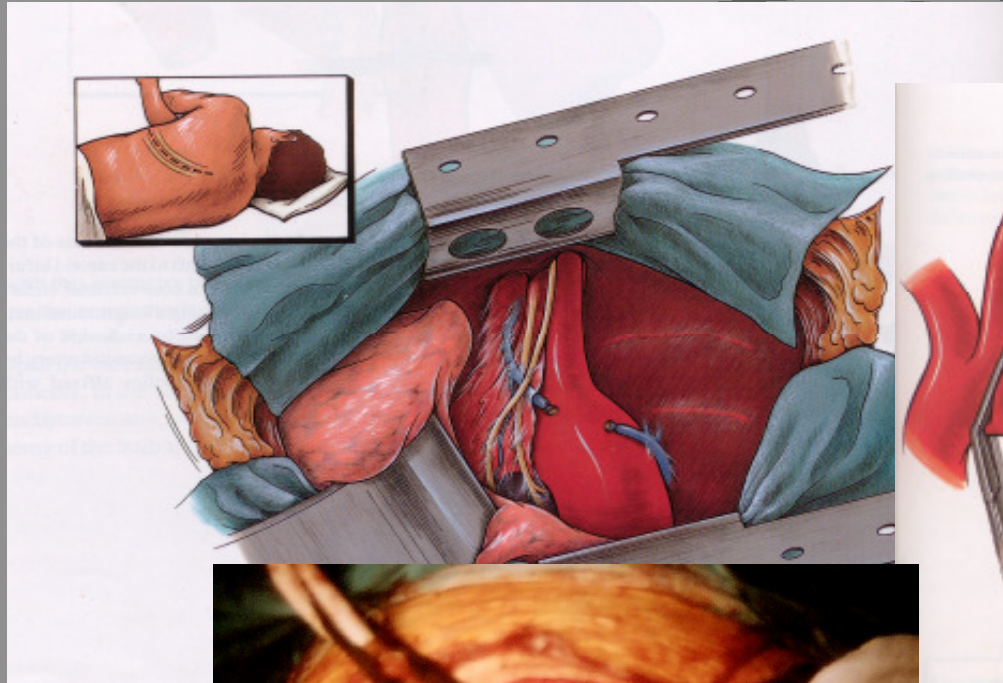
1

10

CHIRURGIA VASCOLA

SUBCLAVIAN ARTERY ANEURYSMS

Surgical technique

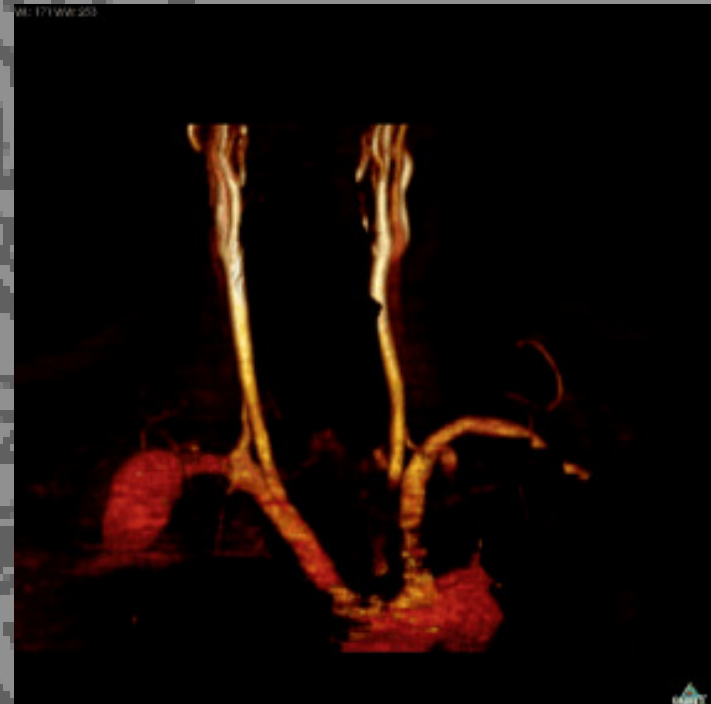
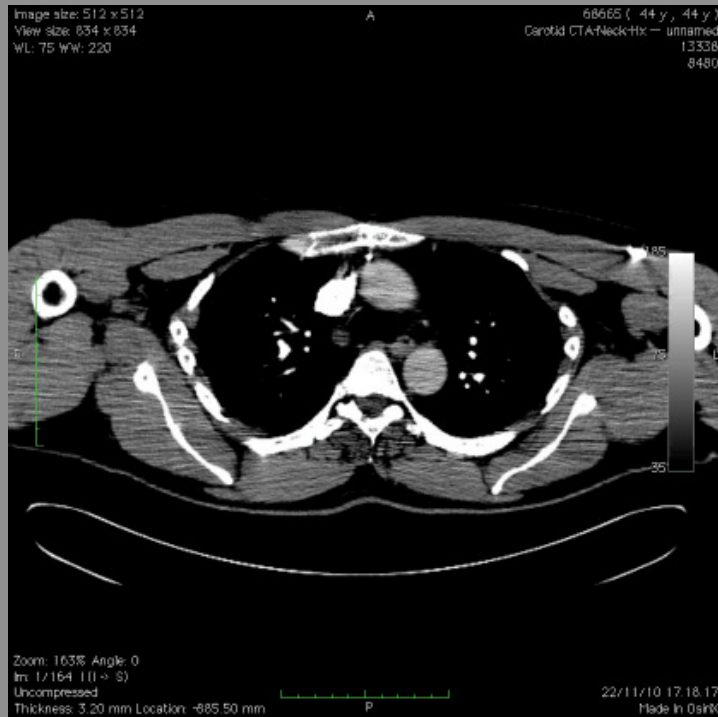


ENDOVASCULAR TREATMENT

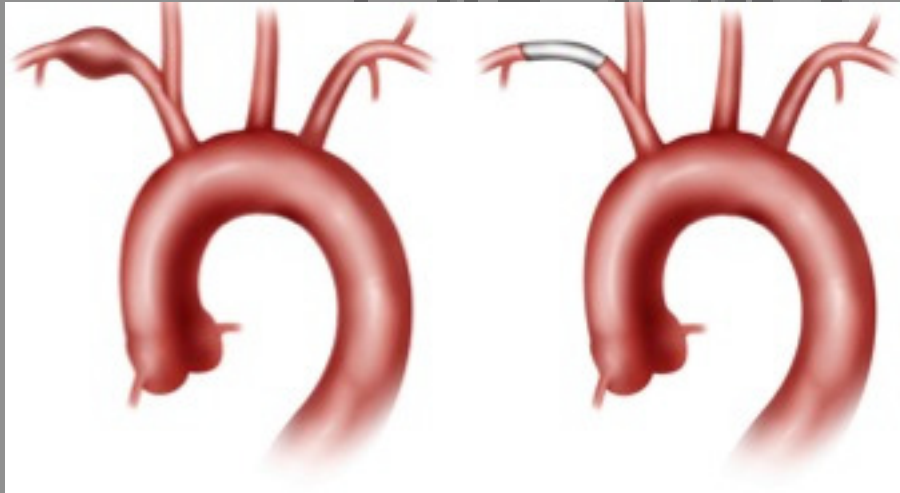
CH

RE ED ENDOVASCOLARE

Subclavian Artery Aneurysm

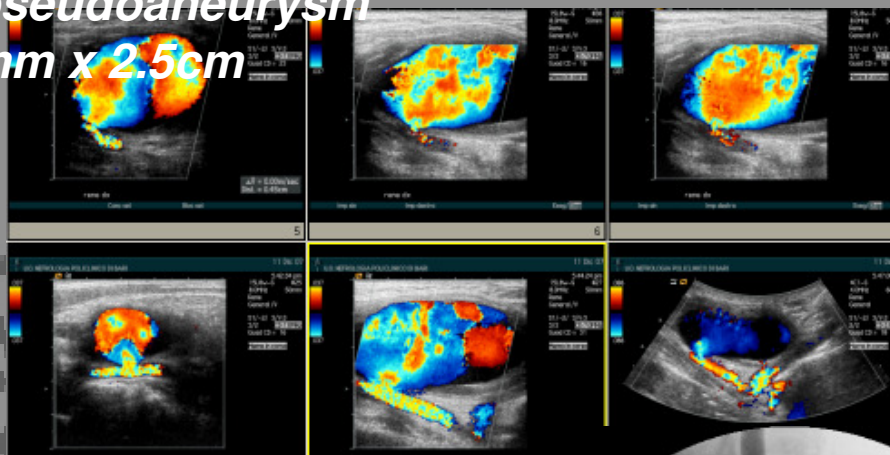


Viabahn 9 mm x 15 cm

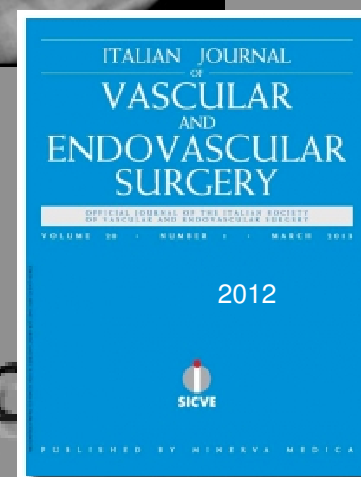
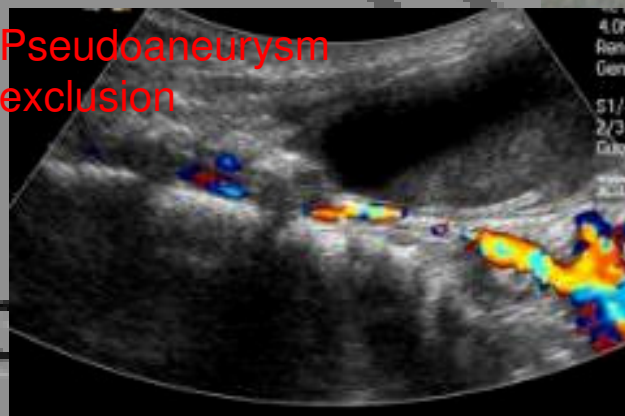


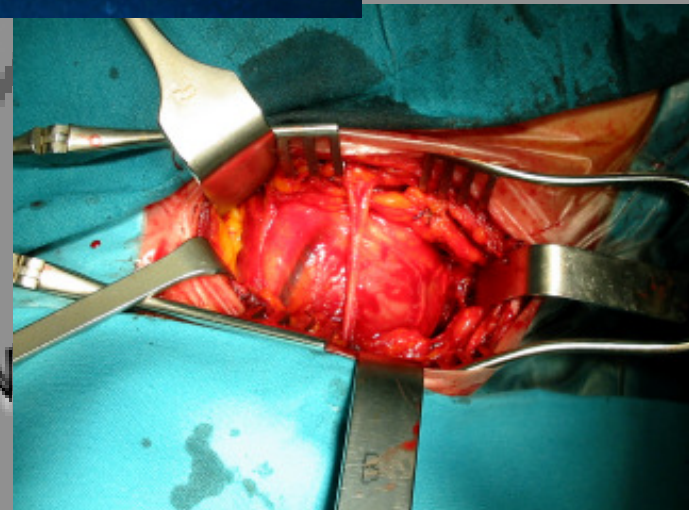
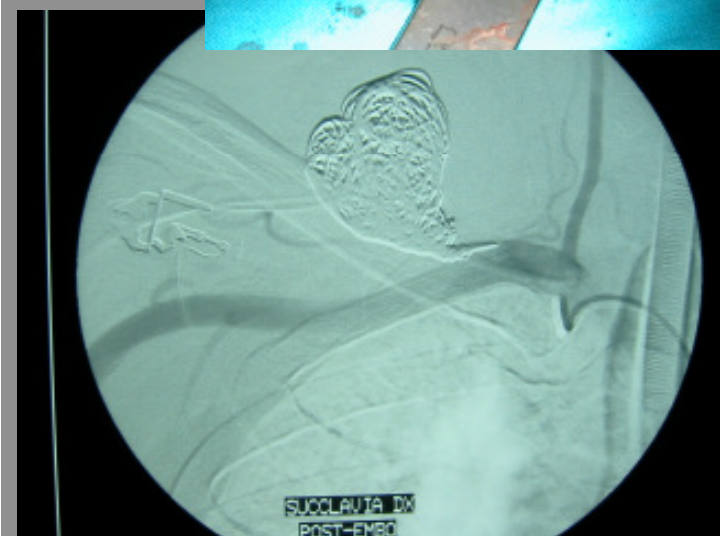
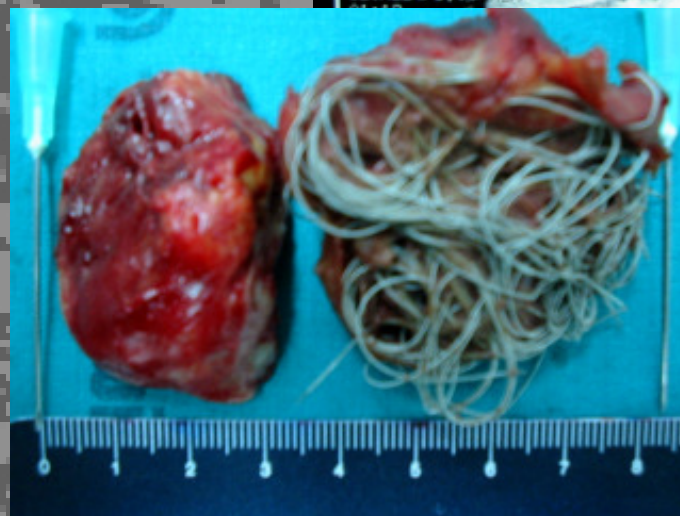
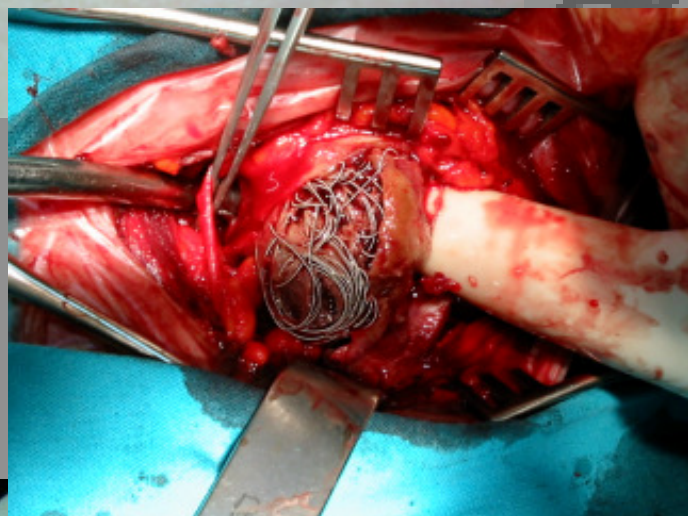
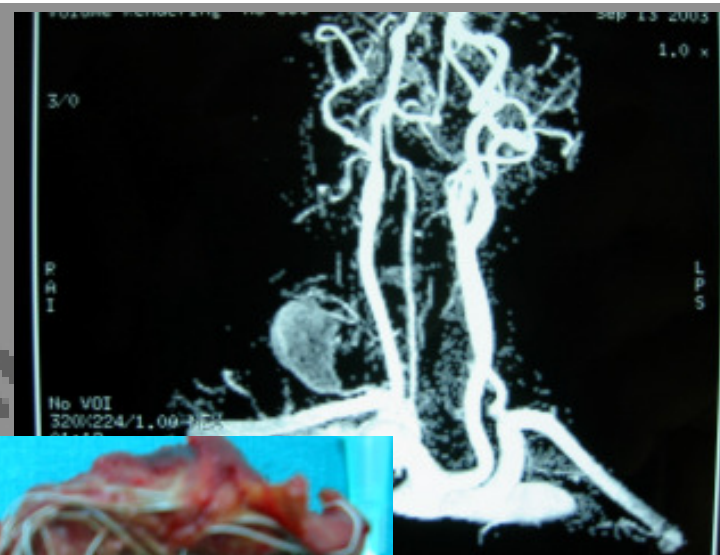
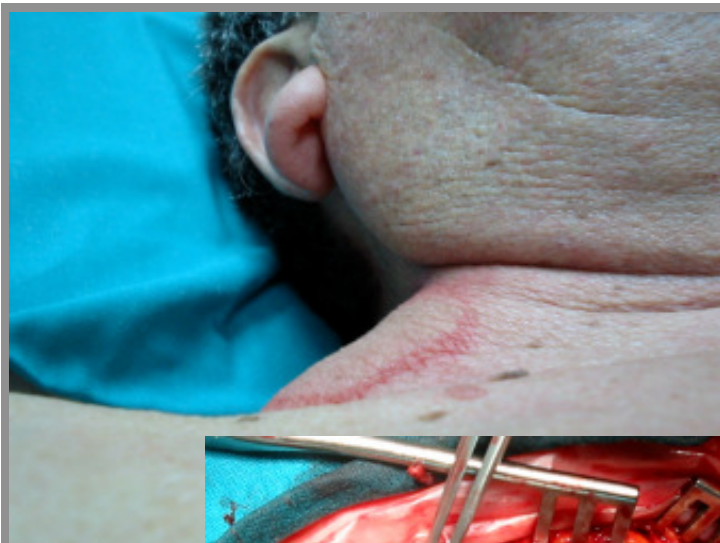
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Vertebral artery pseudoaneurysm Viabahn 5 mm x 2.5cm



Pseudoaneurysm
exclusion





TYPE of OPERATION

n. pts

Shunt

Resection and end to end carotid reconstruction

14

0

Resection and interposition vein graft

5

0

Resection and end to end carotid reconstruction

2

0

+CC+ECA vein graft

CC interposition Dacron PTFE graft

3

0

Carotid bifurcation vein patch

1

0

Innominate interposition Dacron graft

4

1

Innominate Dacron patch

1

0

Aorto-subclavian-carotid Dacron by pass

4

0

Subclavian-subclavian Dacron-PTFE by pass

7

0

Subclavian-axillary venous graft

1

0

Endovascular

Endoprothesis

5

Embolization

1

Hybrid Endoprothesis + embolization + by pass

1

Results of reconstructive surgery: carotid arteries

Author	n.	Mortality %	Periop. Event %	Nerve injuries %(Per/Tr)
D'Addato 1996	24	0	4,5	NR
Zhang 1999	66	1,6	6.1	6
Rosset 2000	25	0	4	44
El Sabrout 2000	67	6,1	7,6	6
Radak 2007	91	2,2	5,5	
Attigah 2009	64	0	1,6	
Srivastava 2010	20	0	1,5	
Garg 2012	16	0	0	
Regina 2013	26	0	0	

* Temporary

Dexamethasone minimizes the risk of cranial nerve injury during CEA

Guido Regina, MD,^a Domenico Angiletta, MD,^a Giovanni Impedovo, MD,^a Giovanni De Robertis, MD,^a Marialuisa Fiorella, MD,^b and Maria Rosaria Carratu', MD,^c Bari, Italy

Objective: The incidence of cranial and cervical nerve injury during carotid endarterectomy (CEA) ranges from less than 7.6% to more than 50%. Lesions are mainly due to surgical maneuvers such as traction, compression, tissue electrocoagulation, clamping, and extensive dissections. The use of dexamethasone (DEX) and its beneficial effects in spinal cord injuries have already been described. We investigated whether DEX could also be beneficial to minimize the incidence of cranial and cervical nerve injury during CEA.

Purpose: To evaluate whether dexamethasone is able to reduce the incidence of cranial nerve injuries.

Materials and Methods: From March 1999 through April 2006, 1126 patients undergoing CEA because of high-grade

Journal of Vascular Surgery® 2009

year. recovery time took from 2 weeks to 12 months, with a mean time of 8.6 months. The χ^2 test was used to compare the two groups and to check for statistical significance.

Results: The incidence of cranial nerve dysfunction was higher in group B and the statistical analysis showed a significant effect of dexamethasone in preventing the neurological damage ($P = .0081$). The incidence of temporary lesions was lower in group A and the χ^2 test yielded a P value of .006. No statistically significant differences were found when comparing the effect of dexamethasone in men and women. In addition, dexamethasone had no statistically significant effect on the incidence of permanent cranial nerve injuries. Finally, no adverse effect related to the administration of dexamethasone was observed.

Conclusion: Perioperative administration of dexamethasone is effective in minimizing the incidence of temporary cranial nerve injuries during CEA. (J Vasc Surg 2009;49:99-103.)

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Results of reconstructive surgery: innominate and subclavian arteries

<i>Author</i>	<i>year</i>	<i>n.</i>	<i>Mortality %</i>	<i>Complications %</i>
Thomas	1971	5	20	20
Mc Collum	1979	6	0	NS
Salo	1990	10	30	50
Bower	1991	44	20	NS
Kieffer	2001	27	11	18
Andersen	2013	22	5	5
Regina	2013	23	4*	21*

NS : non specified

- 1 by pass obstruction
- 1 bleeding
- 2 distal embolization
- 1 pseudoaneurysm

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Endovascular treatment

Eur J Vasc Endovasc Surg (2011) 42, 419–426



ELSEVIER

REVIEW

....technically feasible with high procedure success and relatively low complication rate Short and Mid term outcomes repair appear to be favourable



Endovascular Stenting of Extracranial Carotid Artery Aneurysm: A Systematic Review **CME**

Mortality 4.1% Stroke rate 1.8% Cranial nerve injuries 0.5%

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Endovascular treatment

Intrathoracic subclavian artery aneurysm repair
in the thoracic endovascular aortic repair era

Modern endovascular techniques expand SAA repair options with excellent results....without the need for sternotomy or thoracotomy

Mortality 5% Stroke rate 5%

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Endovascular treatment

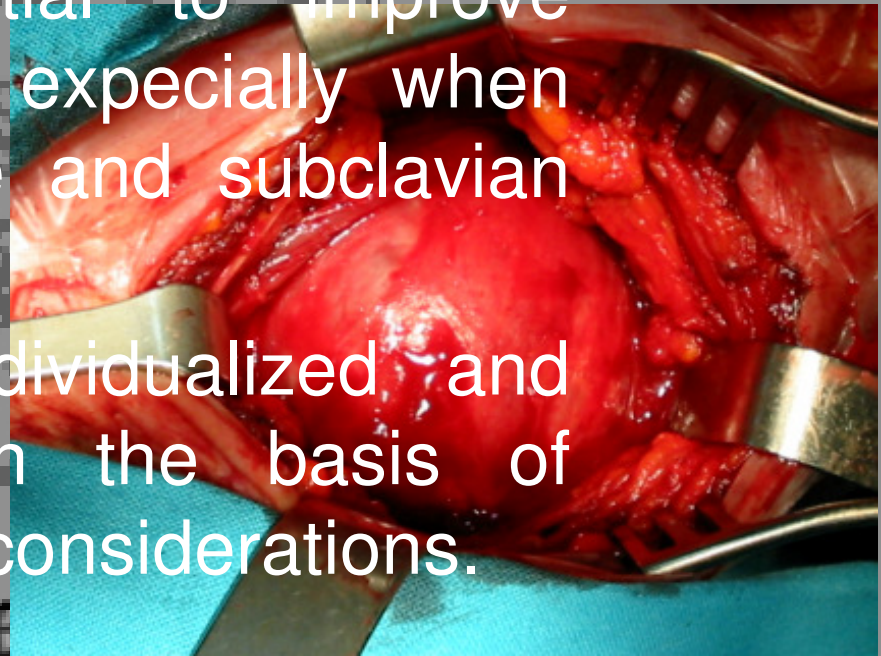
[Ann Vasc Surg.](#) 2010 Jan;24(1):100-5.

Long-term follow-up data are necessary to determine whether the durability of the endoluminal approach warrants more widespread use.

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CONCLUSIONS

- Although open aneurysm repair remains the standard of care, the advent of endoluminal techniques and stent grafts has significant potential to improve treatment of aneurysms especially when considering innominate and subclavian arteries.
- Therapy must be individualized and treatments tailored on the basis of anatomic and etiologic considerations.



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Welcome to Bari SICVE 2013



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