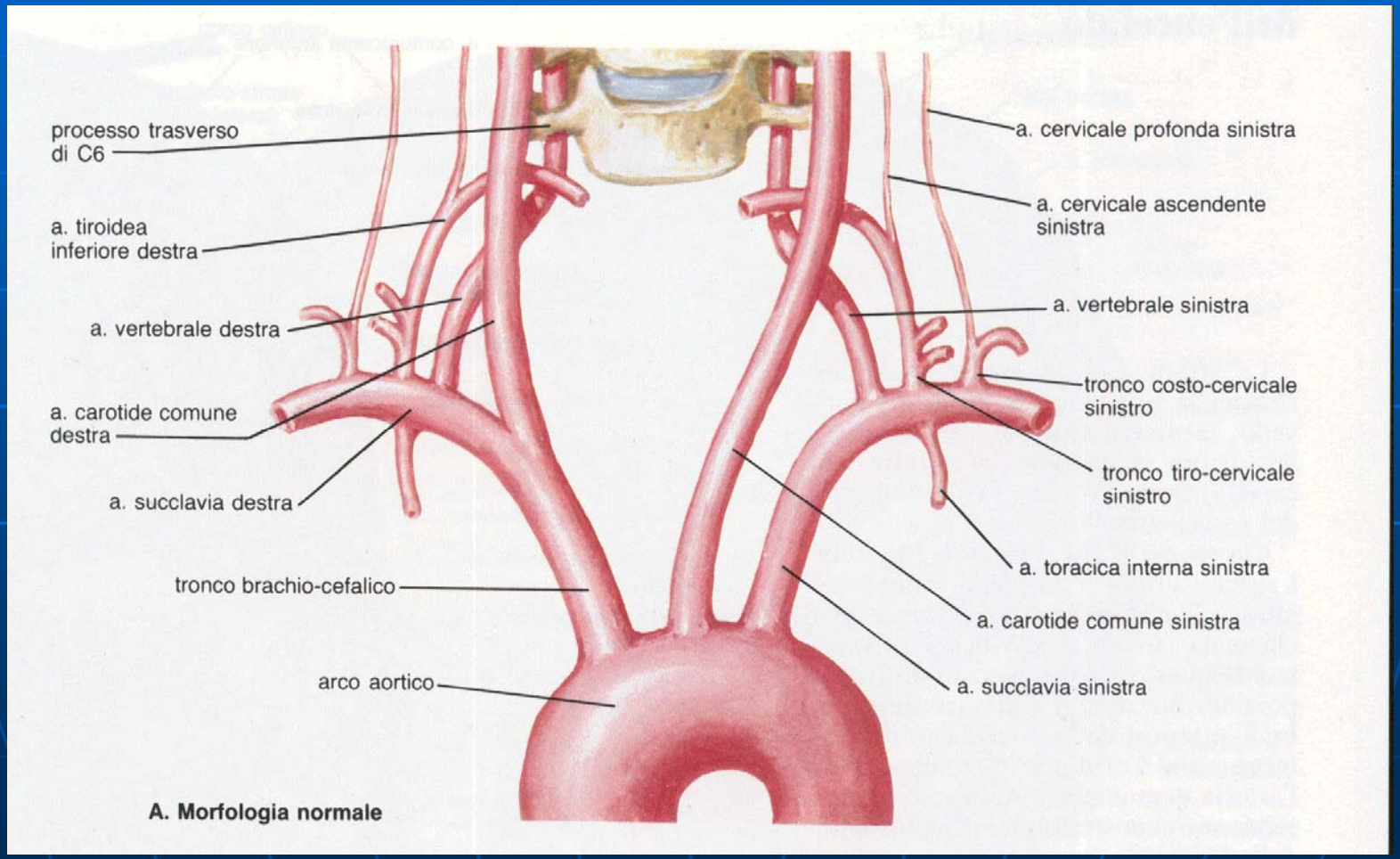
VASI CEREBROAFFERENTI



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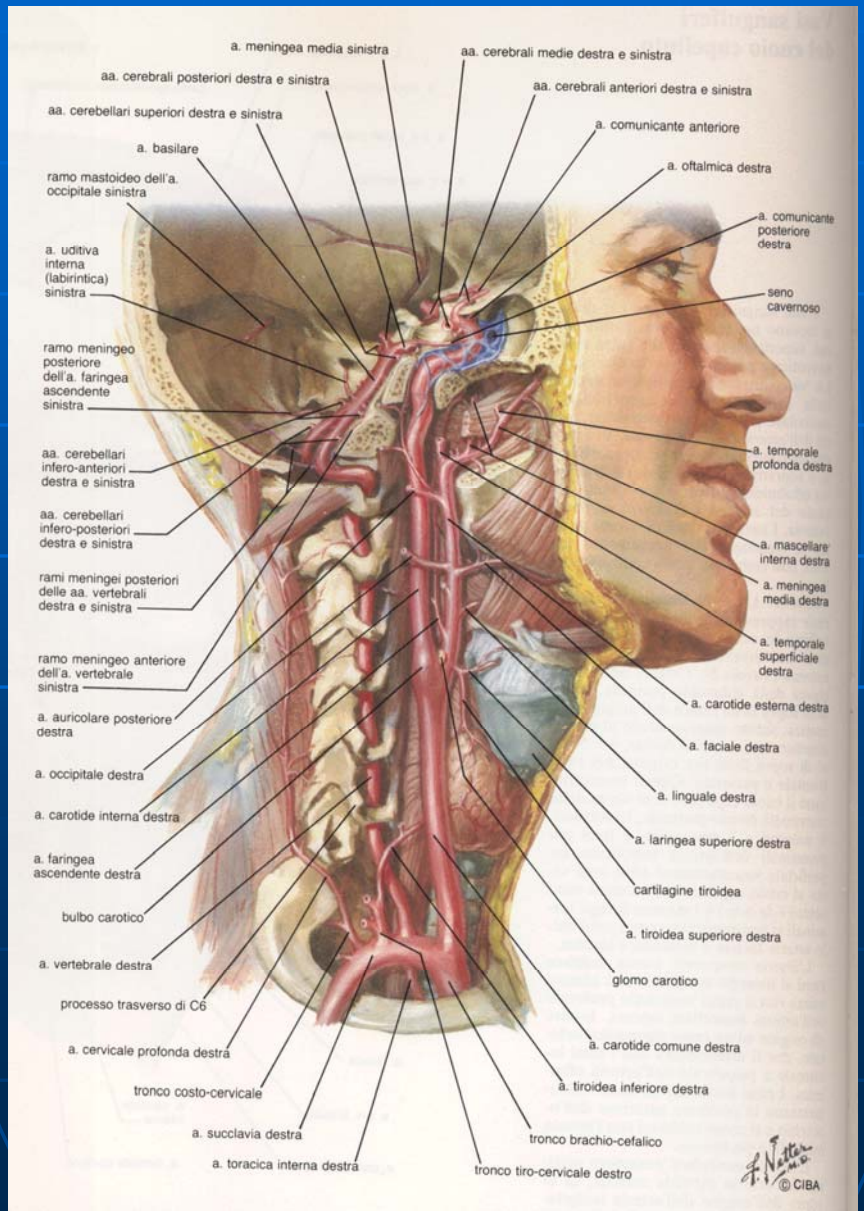

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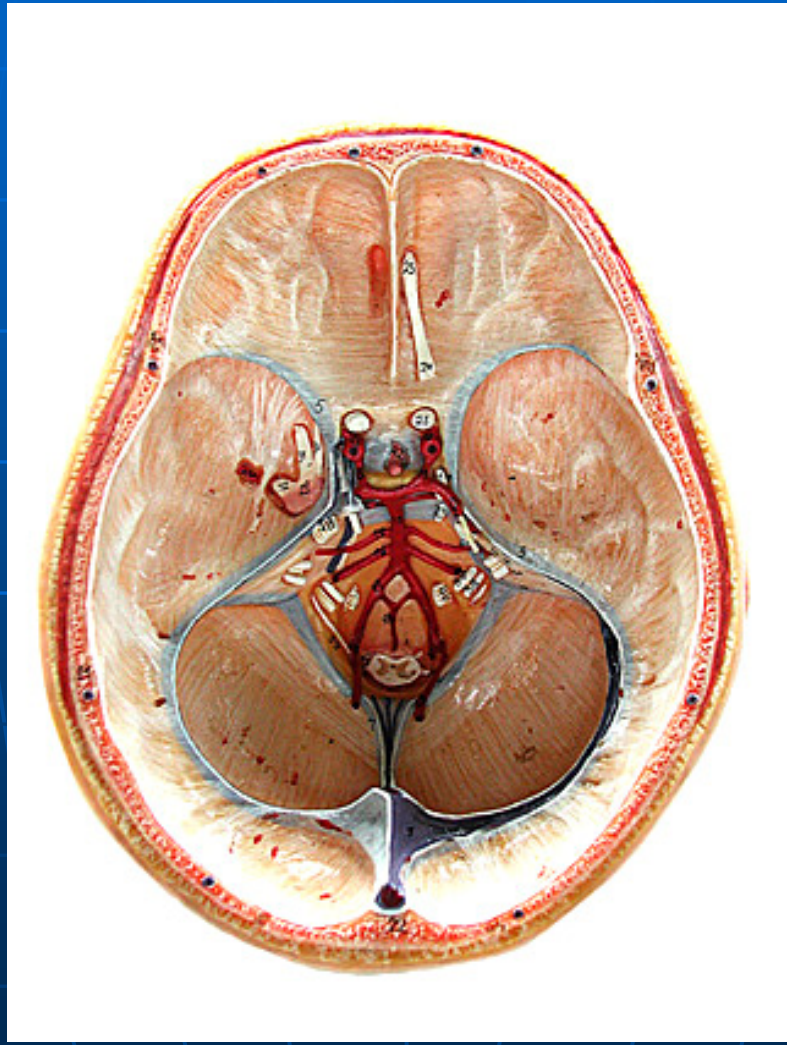


FISIOPATOLOGIA DEL CIRCOLO CEREBRALE

Flusso ematico cerebrale (Cerebral Blood Flow):

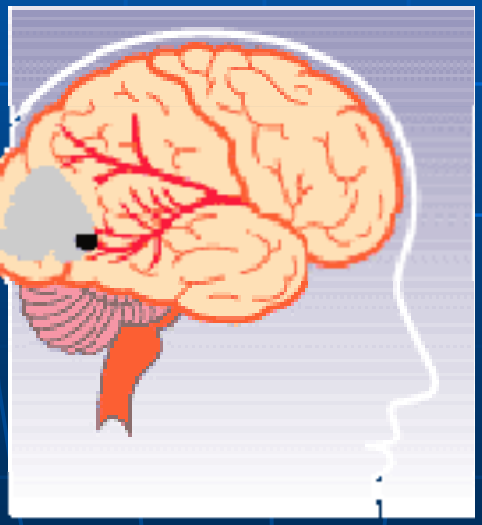
750–1000 ml/min, circa 2/3 dalle carotidi interne

CBF per unità di massa: 50-55-ml/100g/min.

Il CBF rimane costante grazie ad un insieme di meccanismi di feed-back e di protezione di ordine **anatomico** (poligono di Willis e anastomosi varie), **emodinamico** (riflessi cardiovascolari sistemici, ecc.) e **fisico-metabolico** (pH, pCO2,ecc)**.**

FISIOPATOLOGIA DEL CIRCOLO CEREBRALE

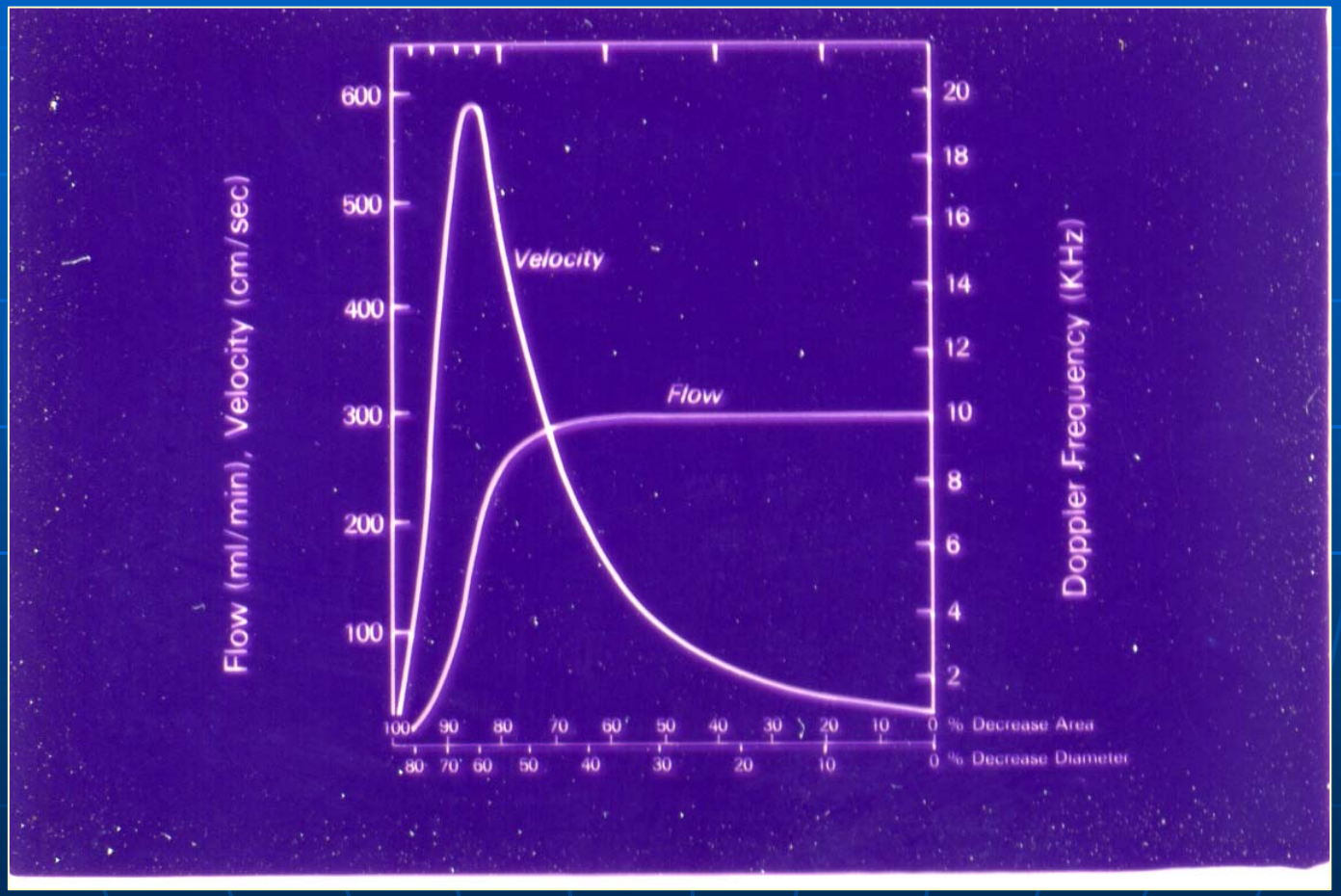
- Quando il CBF scende al di sotto dei 10 ml/100g/min si determinano danni cerebrali irreversibili.



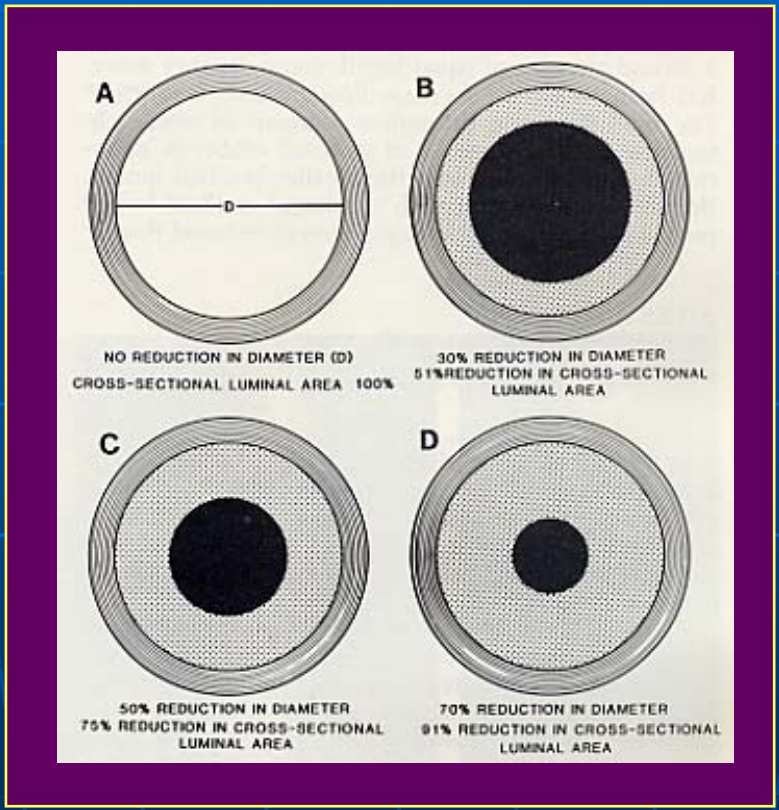
CAUSE DI ISCHEMIA CEREBRALE

1. embolie cardiogene.
2. carotidopatie: **stenosi**, dissezione, occlusione, pseudo-occlusione, displasia fibrocistica.
3. furto della succlavia.
4. patologia dell'arteria vertebrale: stenosi, dissezione, occlusione.
5. occlusioni emboliche dell'arteria silviana.
6. aneurismi giganti.
7. occlusioni emboliche dell'arteria basilare.
8. arteriopatie infiammatorie (Moyamoya disease).

RIDUZIONE LUME VASALE / VELOCITA' DI FLUSSO



RAPPORTO RIDUZIONE LUME VASALE / PROGRESSIVA DIMINUZIONE DIAMETRO ARTERIOSO



TRIALS STENOSI CAROTIDEE SINTOMATICHE

TABLE 4. *Prospective trials for carotid endarterectomy: symptomatic stenosis*

Trial	Principal investigator	Stenosis criteria (%)	Aspirin	CT	Follow-up (yr)	Projected sample size (Actual)	Primary endpoints	Completion date
ECST	C. Warlow	0–99 (all angio)	Discretion	Yes	5 (mean = 2.7) (mean = 3)	400 (<30% = 374) (>70% = 395)	Ipsilateral stroke	1991
NASCET	H. J. M. Barnett	30–99 (all angio)	Discretion	Yes	5 (mean = 2)	3000 (>70% = 659)	Ipsilateral stroke; stroke-related death; death <30 days after randomization	1991 (<70%) 1996 (30–69%)
VAAST	M. Mayberg S. E. Wilson F. Yatsu	50–99 (all angio)	325 mg/d	Yes	3 (mean = 1)	500 (192)	Ipsilateral stroke or crescendo TIA; death <30 days	1991

INCIDENZA DI STROKE NEI 3 TRIALS IN PAZIENTI SINTOMATICI

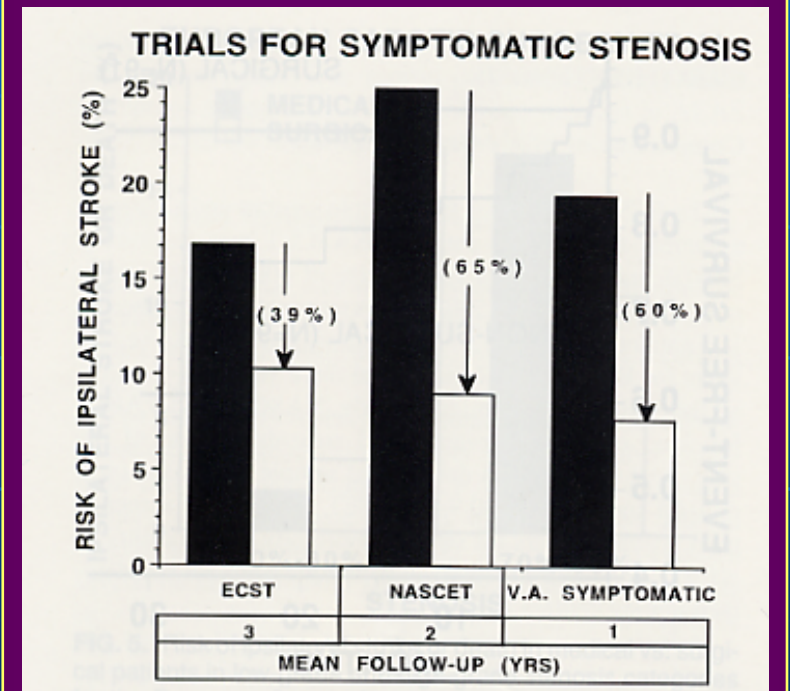


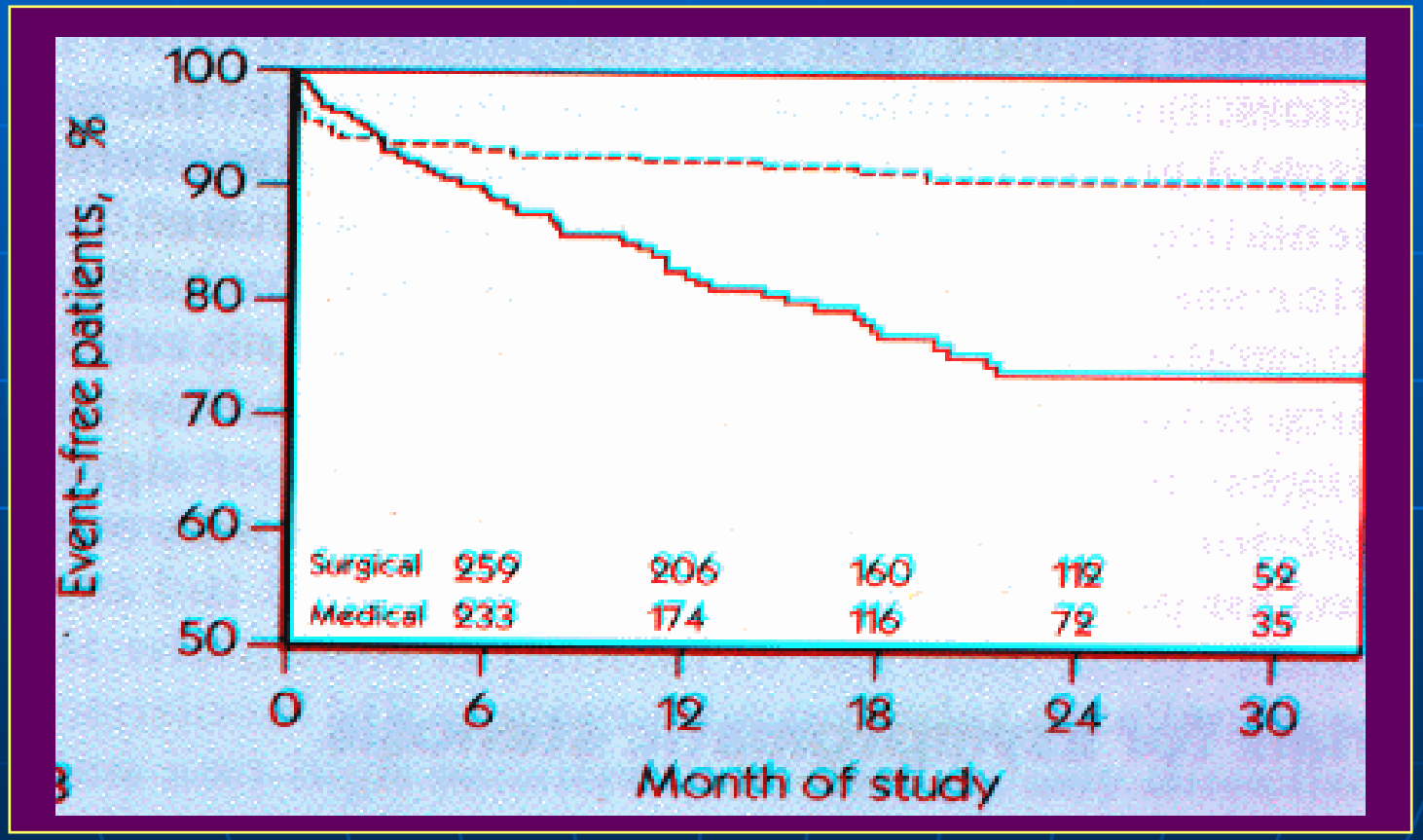
FIG. 8. Comparison of ipsilateral stroke rates in three major trials for carotid endarterectomy in patients with symptomatic carotid stenosis (relative risk reduction in parentheses).

NASCET: 9% versus 26%

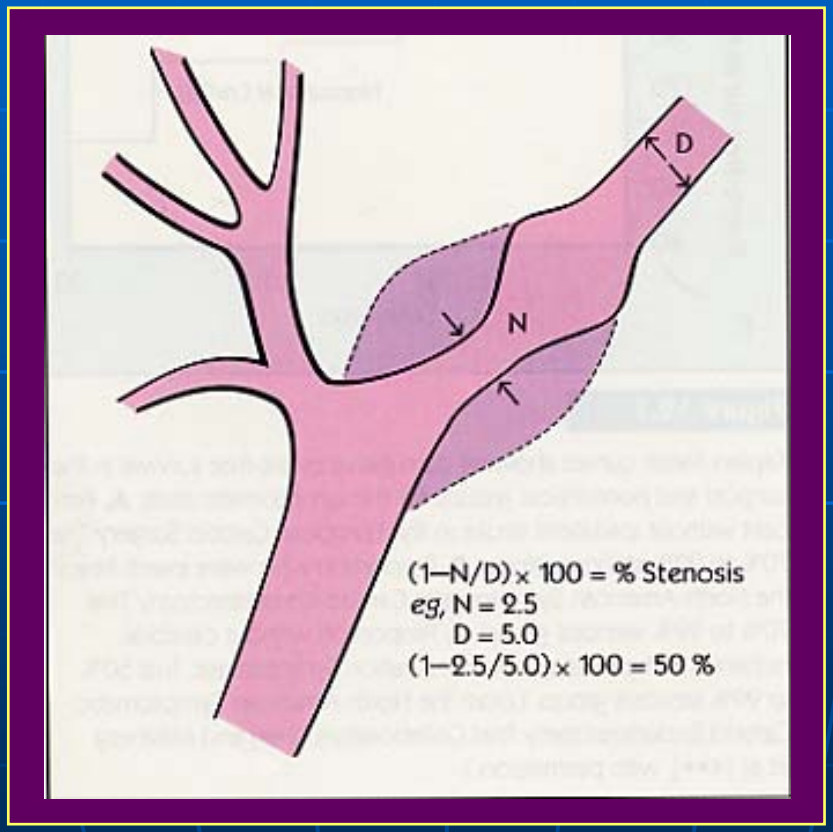
ECST: 2,8% versus 16,8%

VA: 7,7% versus 19,4%

NASCET: Percentuale di pazienti senza eventi nel gruppo con stenosi dal 70 al 99%



METODO DI CALCOLO DEL VALORE DI STENOSI NELLO STUDIO NASCET



TRIALS STENOSI CAROTIDEE ASINTOMATICHE

TABLE 3. *Prospective randomized trials for carotid endarterectomy: asymptomatic stenosis*

Trial	Principal investigator	Stenosis criteria (%)	Aspirin	CT	Follow-up (yr)	Sample size (Actual)	Primary endpoints	Completion date
VAAST	R. R. Hobson	>50 (all angio)	1300 mg/d	No	5 (mean = 4)	500 (444)	TIA or stroke in distribution of randomized artery; death <30 days after randomization	1992
CASANOVA	H. C. Dienes H. Homann	50–90 (noninvasive)	1000 mg/d + dipyridamole 225 mg/d	Yes	3	400 (410)	TIA, stroke or death	1991
ACAS	J. Toole	>60 (angio-surgery only)	325 mg/d	Yes	5 (mean = 2.7)	1500 (1662)	TIA or stroke in distribution of randomized artery; death <30 days after randomization*	1995
MACE	D. Wiebers	>50 (noninvasive)	80 mg/d (nonsurgical group only)	Option	2	900	TIA, RIND, stroke, or death	Terminated

* TIA was later removed as an endpoint.

INCIDENZA DI STROKE NEI 3 TRIALS IN PAZIENTI ASINTOMATICI

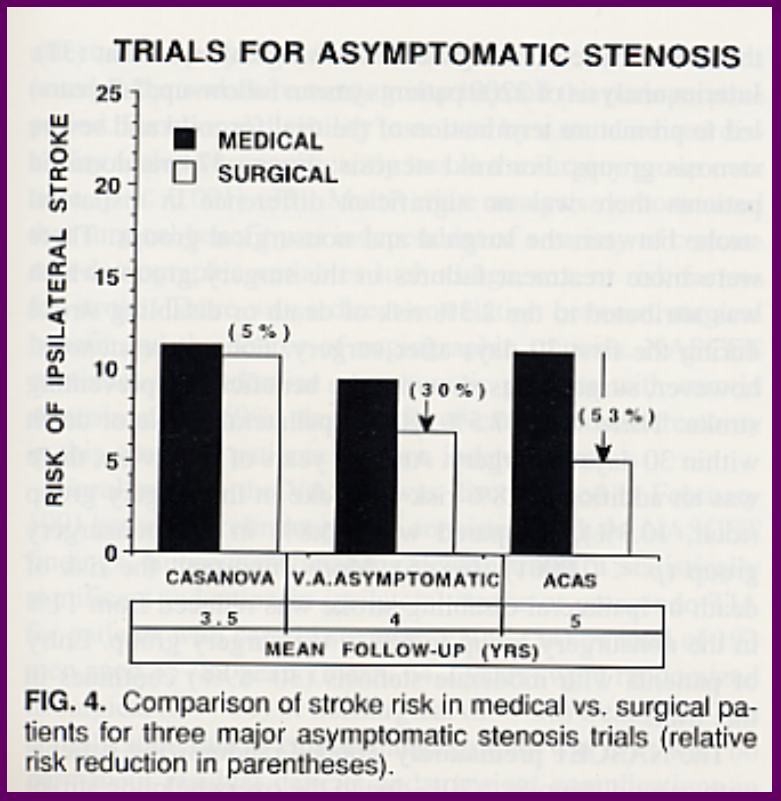


FIG. 4. Comparison of stroke risk in medical vs. surgical patients for three major asymptomatic stenosis trials (relative risk reduction in parentheses).

ACAS: 5,1% vs 11%

VA: 8% vs. 20%

INDICAZIONI ALLA ENDOARTETECTOMIA

Highly appropriate patients
Symptomatic ≥70% stenoses

Appropriate patients when selected
Symptomatic 50%–69% stenoses
Asymptomatic ≥60% stenoses

With surgery more favored when:

Higher degree of stenosis
Plaque ulceration
Contralateral carotid occlusion
Documented progression of stenosis
"Silent" infarcts on CT or MRI
Symptoms despite ASA treatment
Men versus women (greater benefit in men)
"Younger," healthier patient
Low (≤3%) risk of perioperative stroke or death

Inappropriate patients
<50% symptomatic stenoses
<60% asymptomatic stenoses
"Unstable" neurological or medical condition
Recent large cerebral infarction

Frindlay,2001

Contemporary Neurosurgery

ITER DIAGNOSTICO

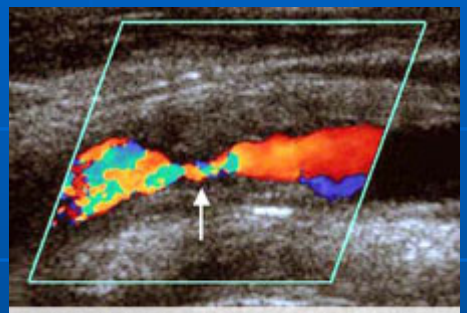
Diagnosi ecografica

↳ Studio angio – TC e/o angio – RM e/o angiografico

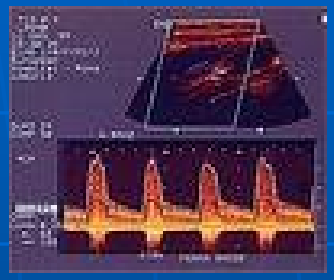
↓

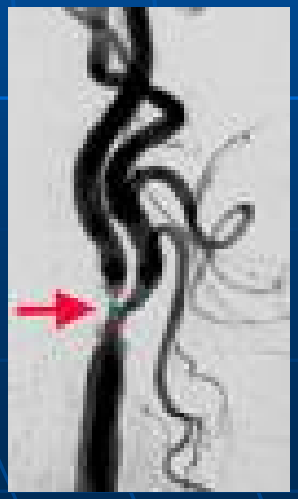
- Conferma del dato ecografico
- Valutazione globale dei vasi cerebro – afferenti e intracranici (lesioni multiple, lesioni tandem, anomalie del poligono di Willis)
- Presenza di eventuali malformazioni aneurismatiche o angiomatose

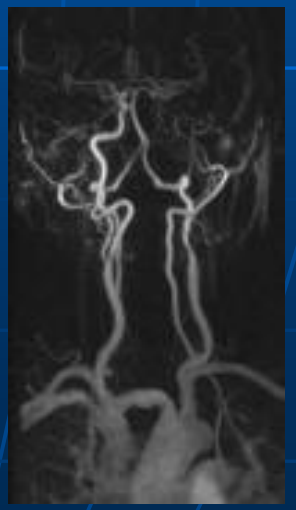
ITER DIAGNOSTICO



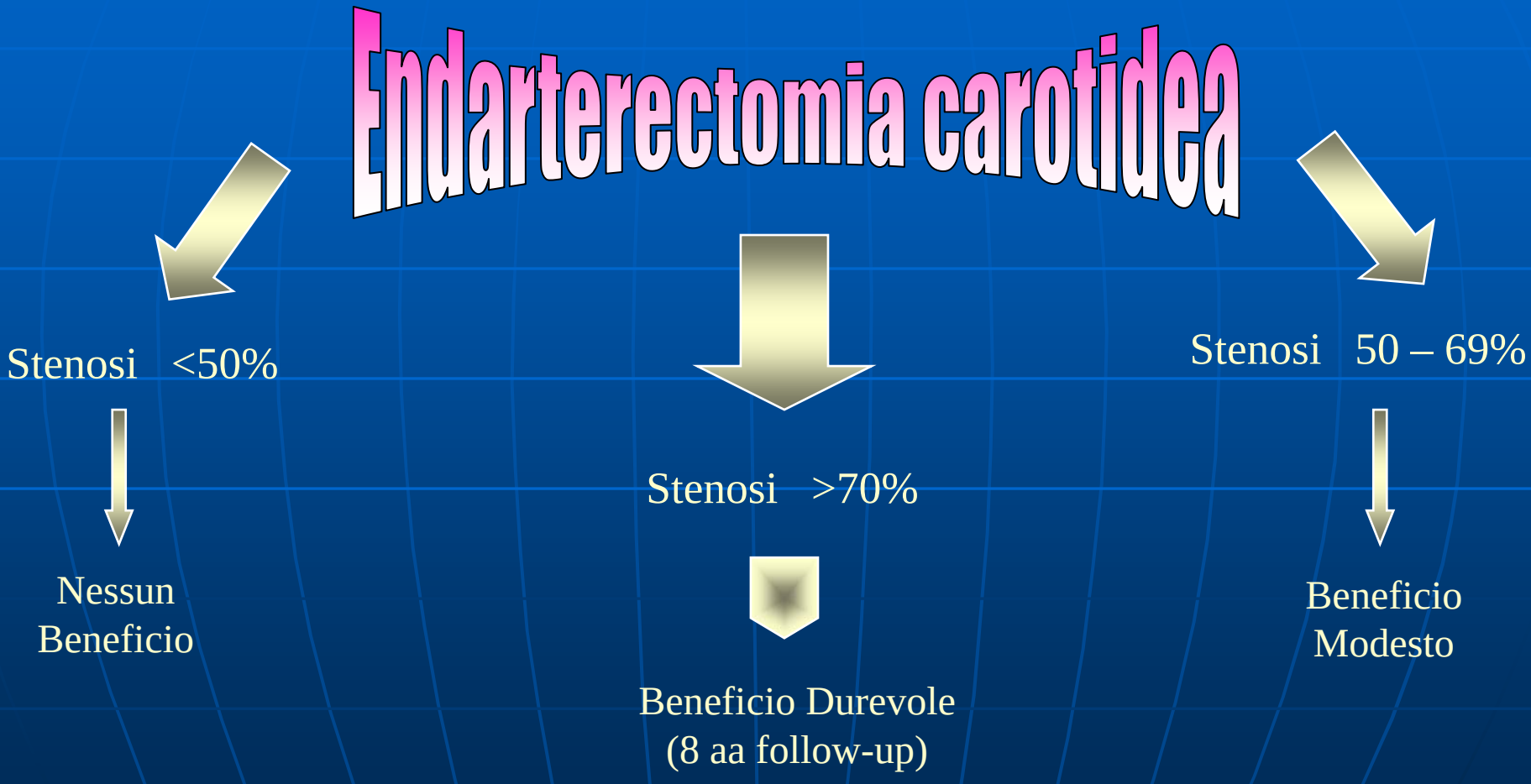
Ecocolordoppler di placca carotidea

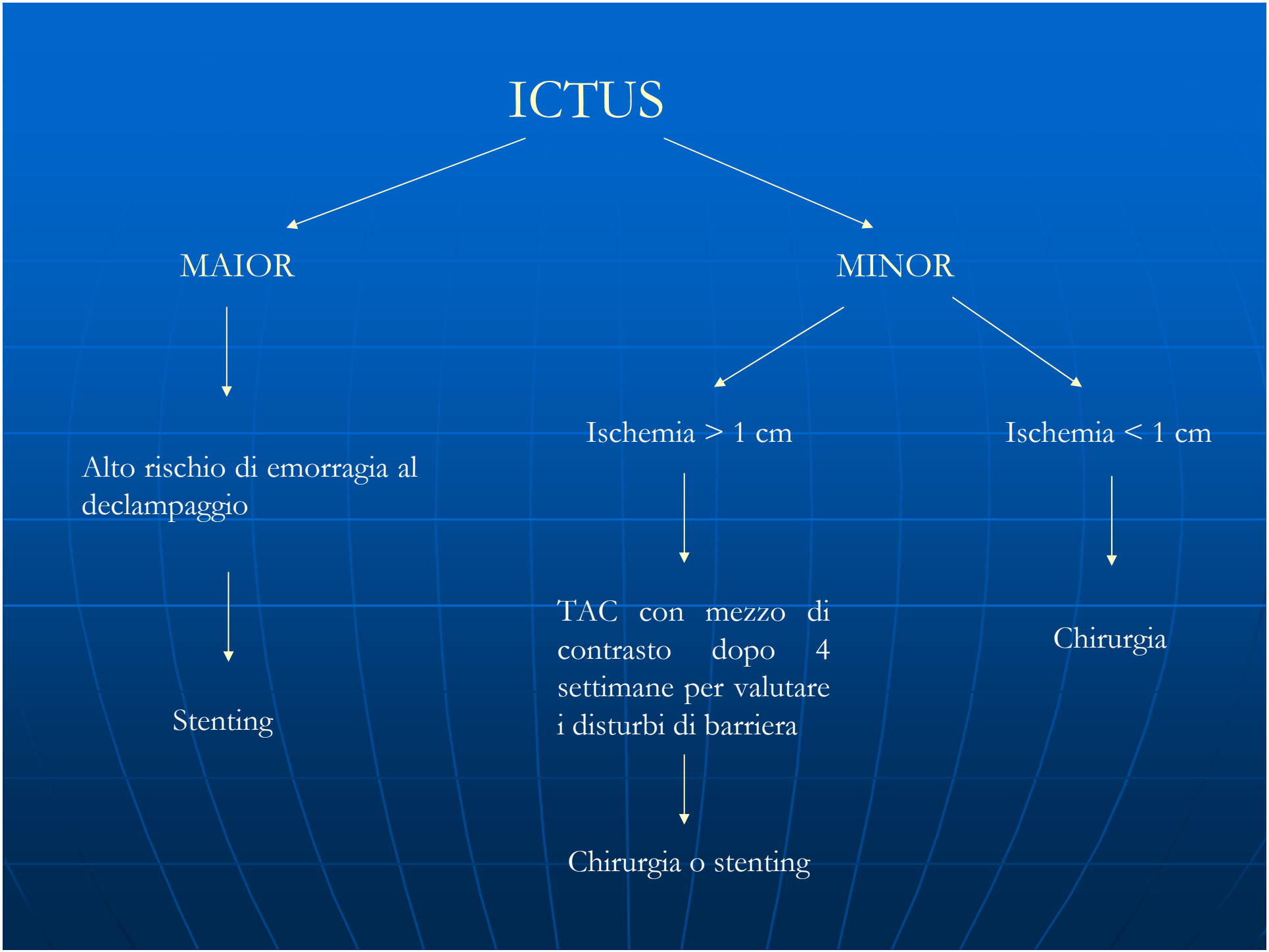






BENEFICI DELLA ENDARTERECTOMIA CAROTIDEA IN PAZIENTI SINTOMATICI CON STENOSI MODERATA O SEVERA



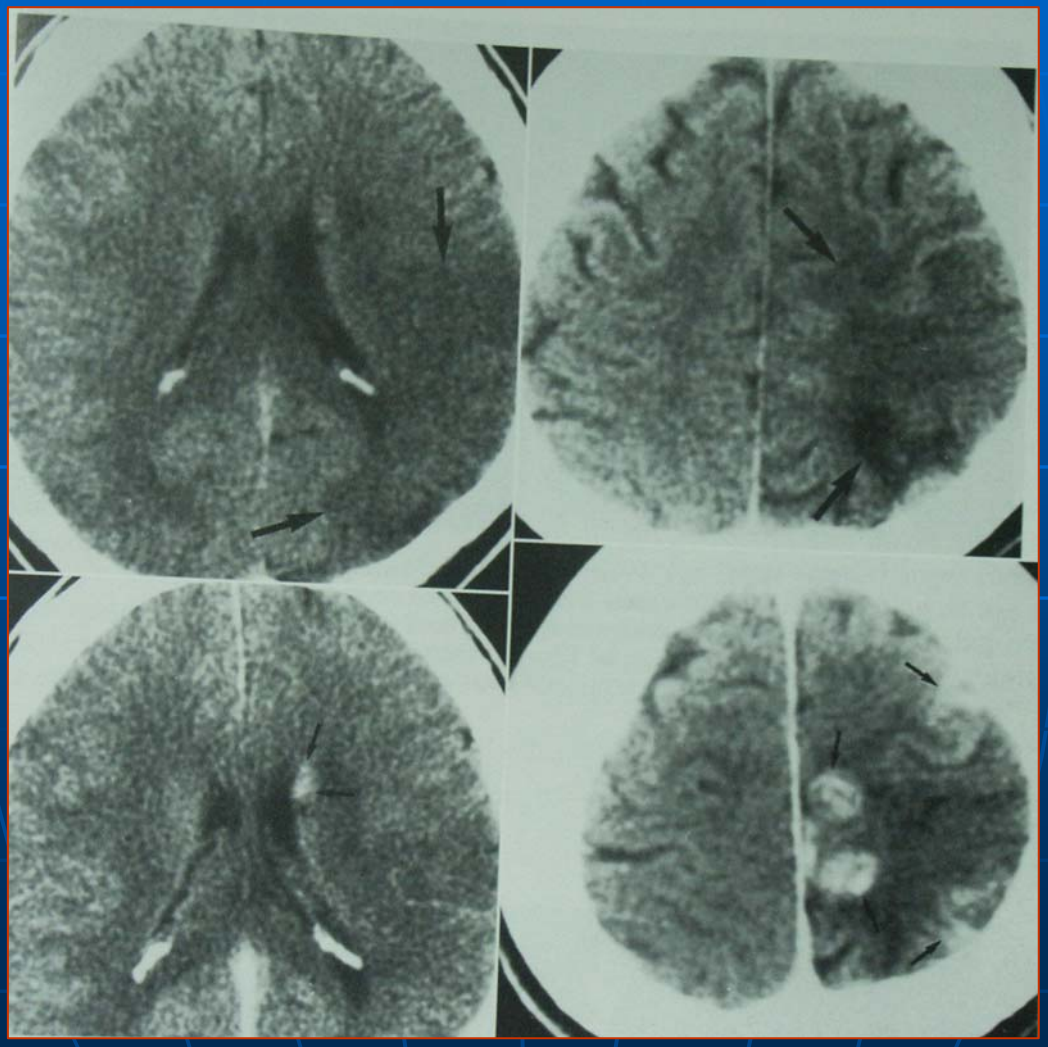

ICTUS
MAIOR
MINOR
Alto rischio di emorragia al declampaggio
Stenting
Ischemia > 1 cm
TAC con mezzo di contrasto dopo 4 settimane per valutare i disturbi di barriera
Chirurgia o stenting
Ischemia < 1 cm
Chirurgia

TIMING CHIRURGICO E STROKE

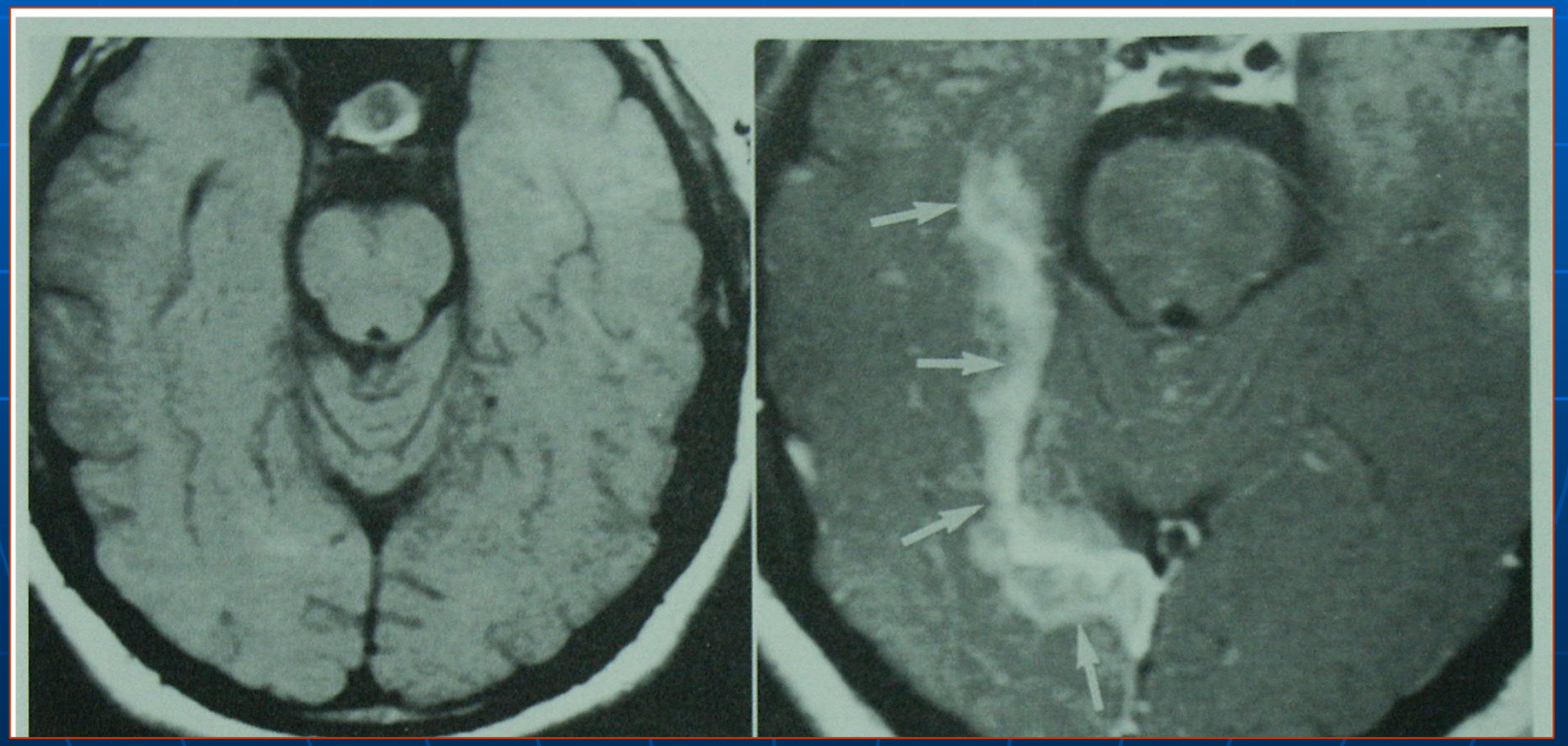
TIMING CHIRURGICO	N° PAZIENTI	COMPLICANZE POST – OPERATORIE
1 – 7 giorni	15	1 (6.6%)
8 – 14 giorni	50	2 (4%)
15 – 21 giorni	64	1 (1.6%)
22 – 28 giorni	34	1 (2.9%)
29 – 90 giorni	39	1 (2.6%)
Totale	201	6 (3%)

Smolakanda V.I.; 12° Congresso Europeo Neurochirurgia Sept. 2003

TAC: LESI0NE ISCHEMICA RECENTE CON TURBE DI BARRIERA

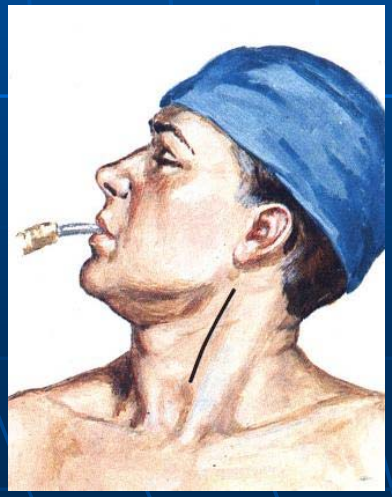


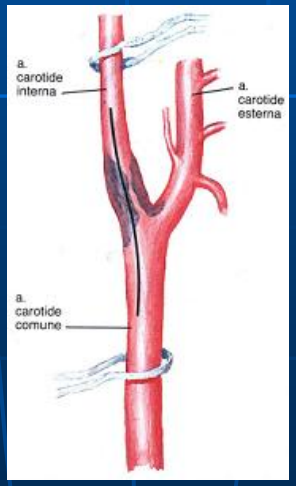
RMN: LESI0NE ISCHEMICA RECENTE CON TURBE DI BARRIERA

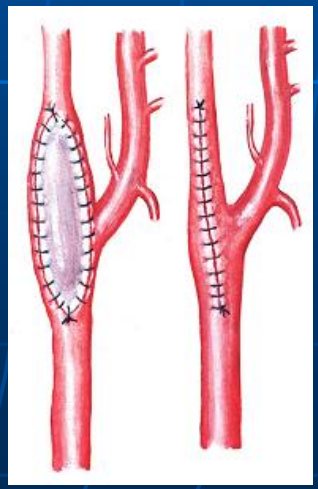


INTERVENTO CHIRURGICO

- Anestesia generale in tutti i pazienti
- Monitoraggio EEG / SSEP + TCD
- Pressione arteriosa al clampaggio > 160 mmHg







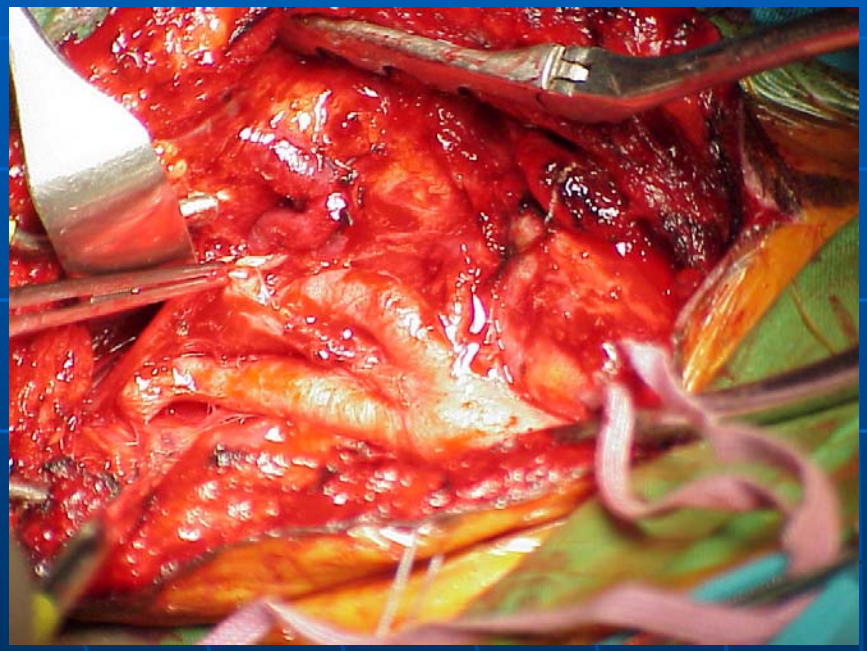
SISTEMI DI MONITORAGGIO INTRAOPERATORI

	Latenza	Gradualità	Affidabilità
EEG	20 – 40 “	SCARSA	OTTIMA
SSEP	55”	OTTIMA	OTTIMA
TCD	IMMEDIATA	OTTIMA	BUONA
TCO	RAPIDA	SCARSA	OTTIMA

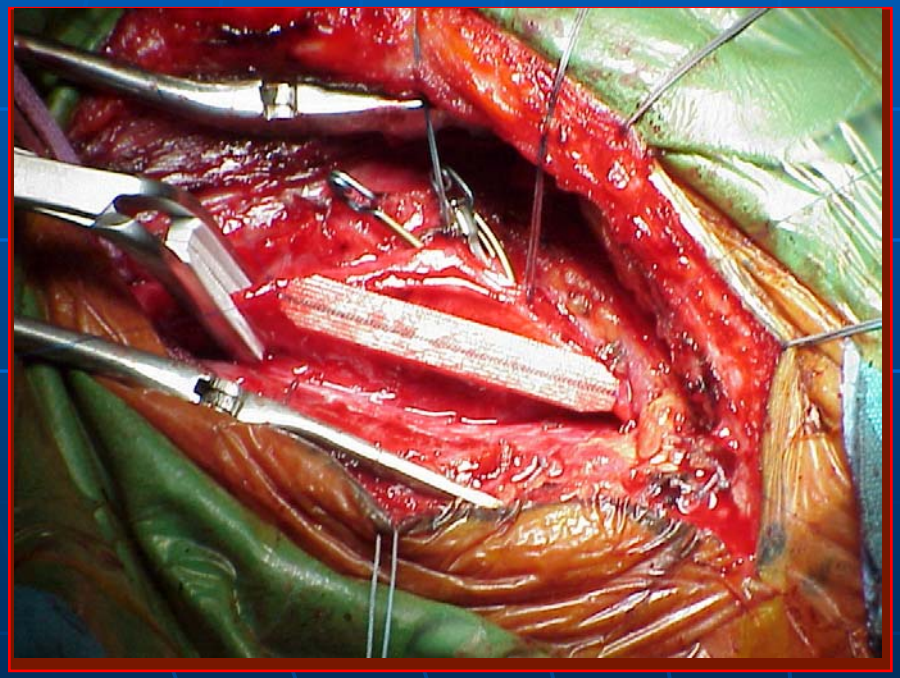
COMPLICANZE MAGGIORI DELLA E.C.

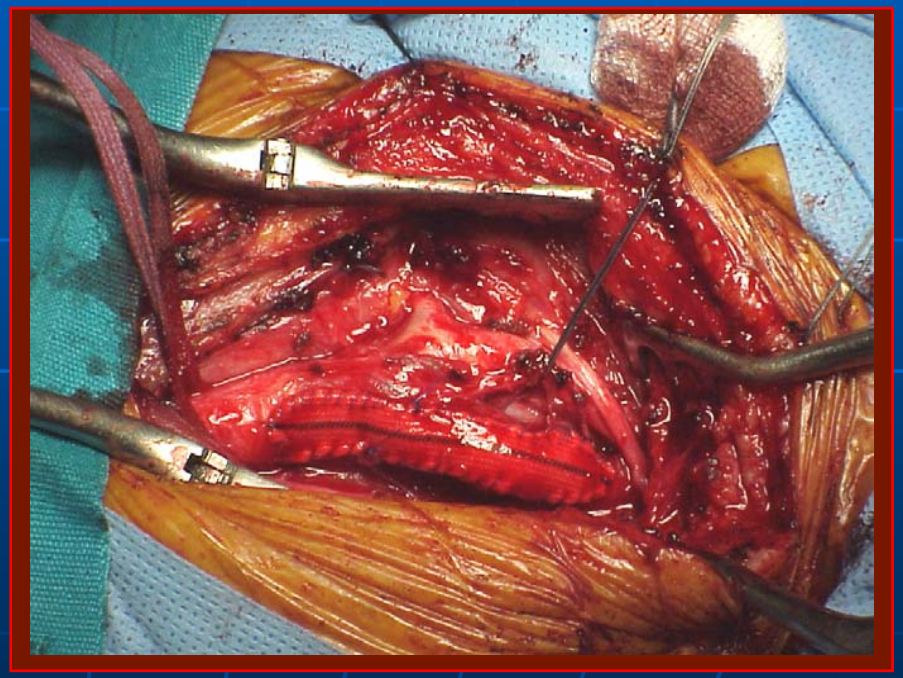
- Embolia cerebrale intraoperatoria (dissez. shunt)
- Ischemia cerebrale intraoperatoria (clampaggio)
- Occlusione post-endoarterectomia
- Emorragia cerebrale post-operatoria (vasodilataz. post-op + ipertensione)
- Lesioni dei nervi cranici (VII,X,XI,XII)
- Ematoma del collo con ostruzione delle vie aeree
- Complicanze cardiovascolari (aritmia, infarto del miocardio, scompenso cardiaco.

Tecnica Chirurgica: Dissezione



Tecnica Chirurgica: Patch in Dacron





STENTING CAROTIDEO

INDICAZIONI:

- Età
- Patologia cardiaca
- Insufficienza respiratoria
- Steno-occlusioni altri assi cerebroafferenti

STENTING CAROTIDEO

COMPLICANZE:

Stroke maggiore 3.3 %

Stroke minore 2.2 %

Restenosi a 5 anni 2%

STENTING CAROTIDEO