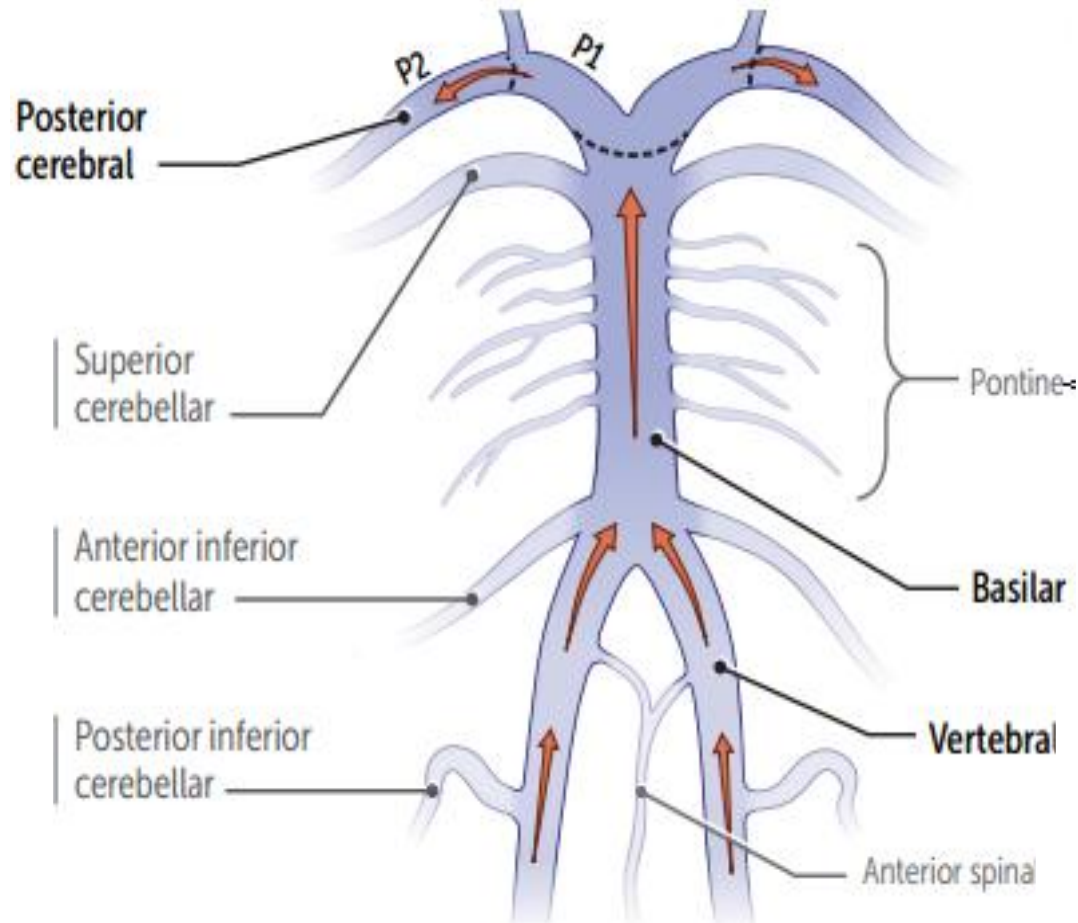


Trombektomi och stentning i bakre cirkulationen

ANS Neurologiveckan 2017



Marcus Ohlsson, MD PHD
Neurointervention
Karolinska Sjukhuset

- No disclosures

Bakre cirkulationen

A vertebralis

A basilaris

PICA

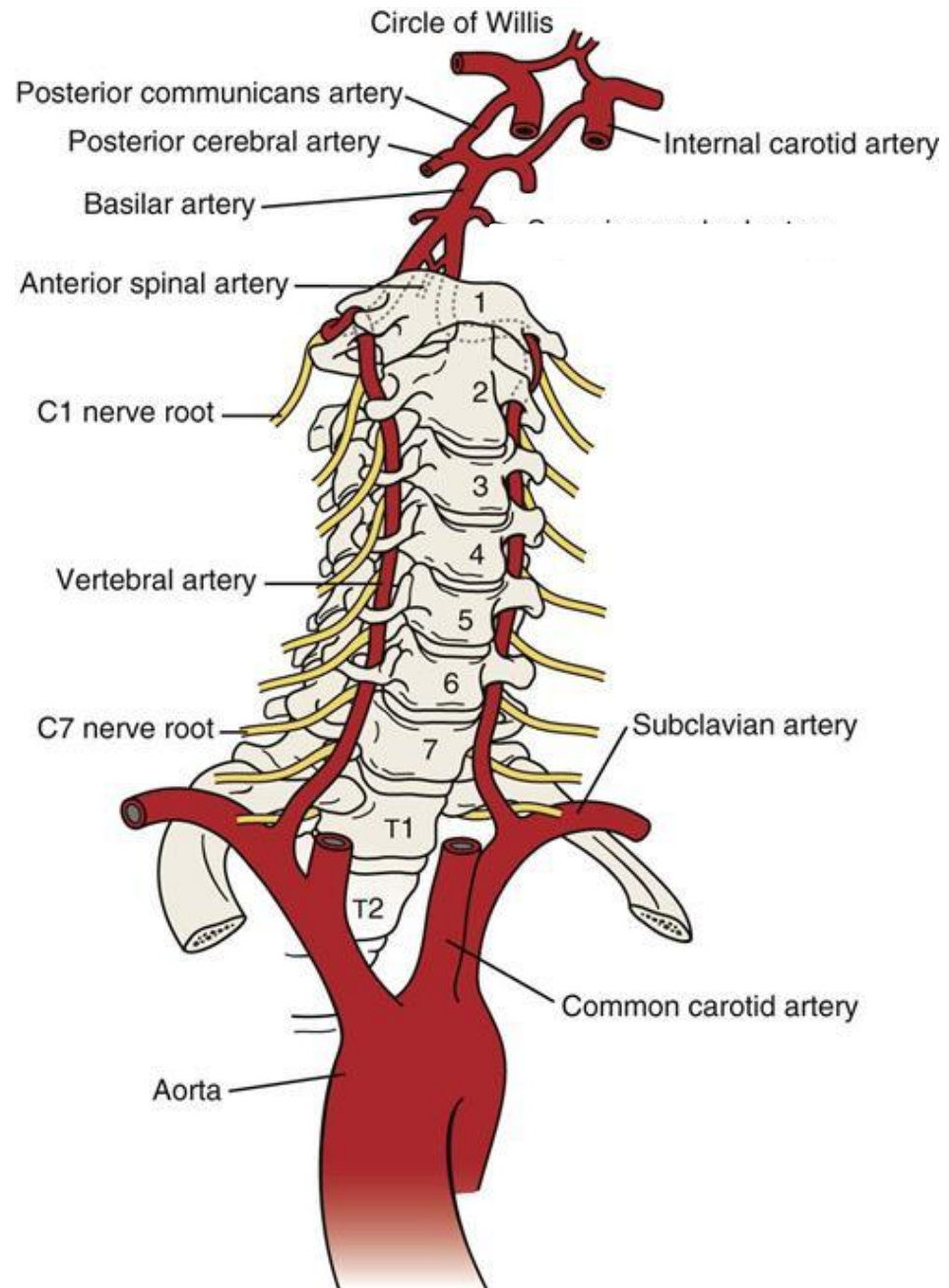
AICA

SCA

P1/2/3 –segmenten

Anatomiska varianter:

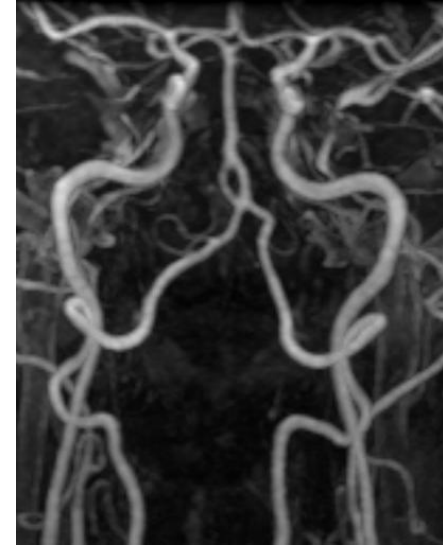
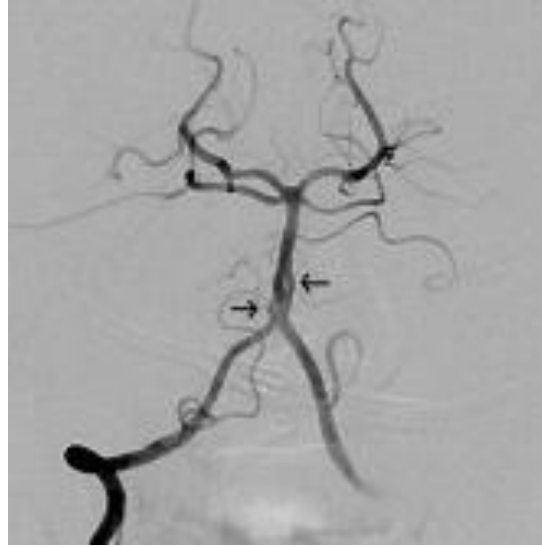
- Fenestrering a basilaris
- Percherons artär
- PAICA
- Persistent trigeminal artery
- Persistent hypoglossal artery



Anatomiska varianter

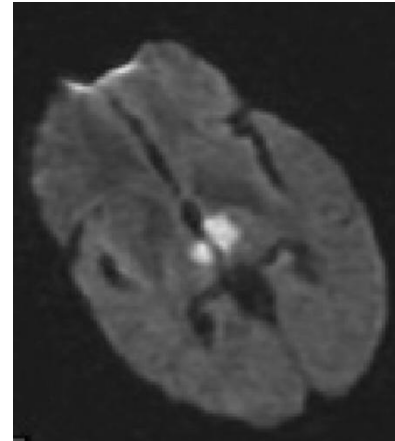
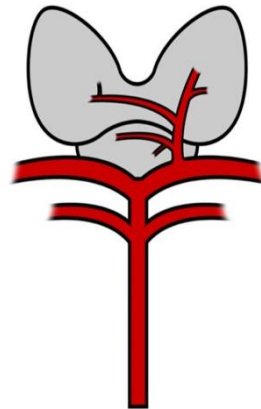
Fenestrering i a basilaris

Basilaris bildas genom fusion av distala aa vertebrales; ofullständig fusion bildar fenestrering, ses hos 2-5% av populationen. Associerade aneurysm vanliga. Tekniska svårigheter vid trombektomi.



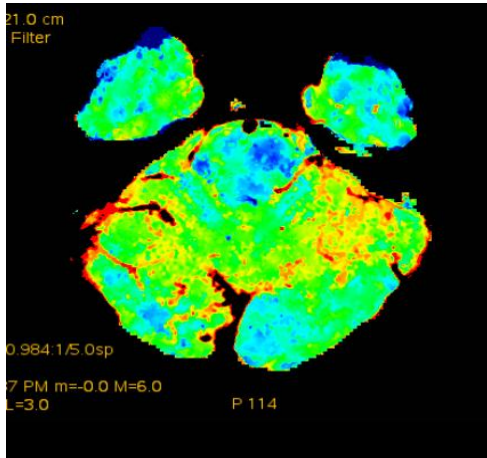
Percherons artär

Solitär gren från dominant P1 till båda thalami, ses hos knappt 3% av populationen.



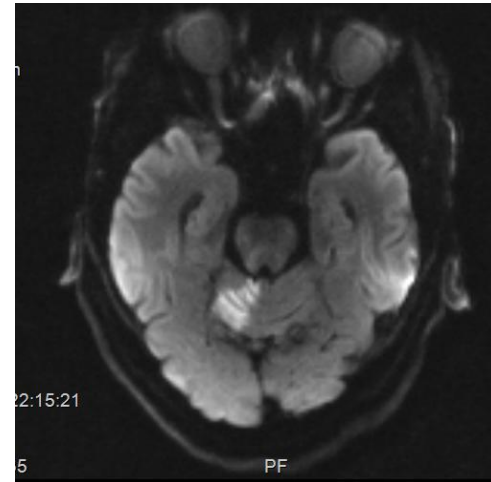
Gerard Percheron
1930-2011

Utredning: DT vs MR



DT/DTA/DTP

Snabbt. DTA utmärkt i bakre cirkulationen. DT och DTP inte optimalt – artefakter, och DTP centrerat till supratentoriella området.



MR/MRA

Patient MR-kompatibel?
Snabbt protokoll < 15 minuter.
Utmärkt infarktdiagnostik i hjärnstam och cerebellum.
MRA inte lika bra som DTA.

DT/DTA/DTP

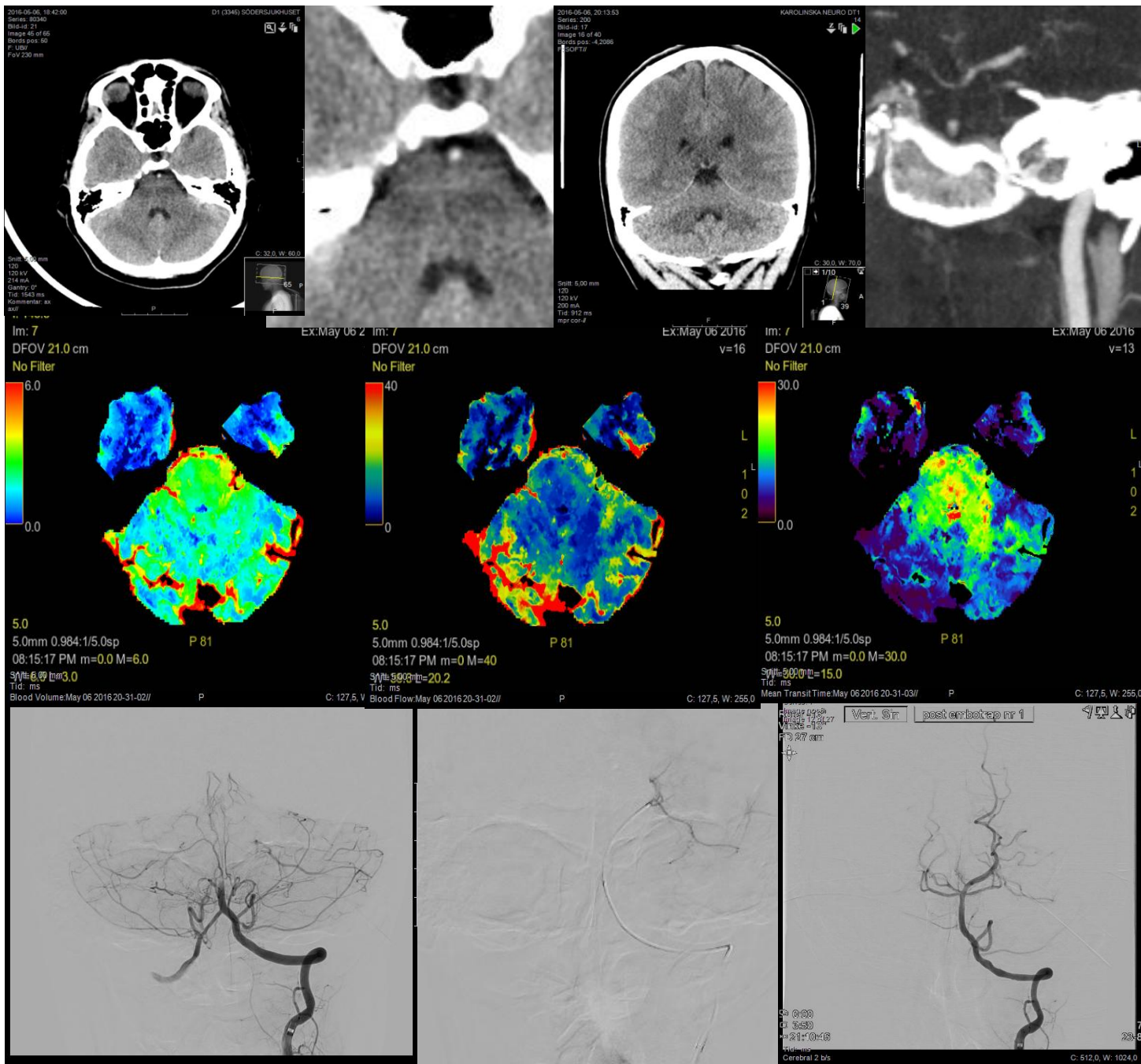
21-årig man

Liten ASD, i övrigt inga riskfaktorer.

16:30: vä arm faller, vä tydlig facialispares, dysartri. Inkommer Södersjukhuset 18:30.

NIHSS skattas till 8. DT visar dense vessel sign, DTA basilarisockklusion. Trombolys. Övertag.

Stabil klinik. DTA och DTP:



Dense vessel BA
Ingen infarkt
Basilarisockklusion

DTP:
ABV-ABF-MTT
-> Kompenserad
perfusionsdefekt
/mismatch

Trombektomi

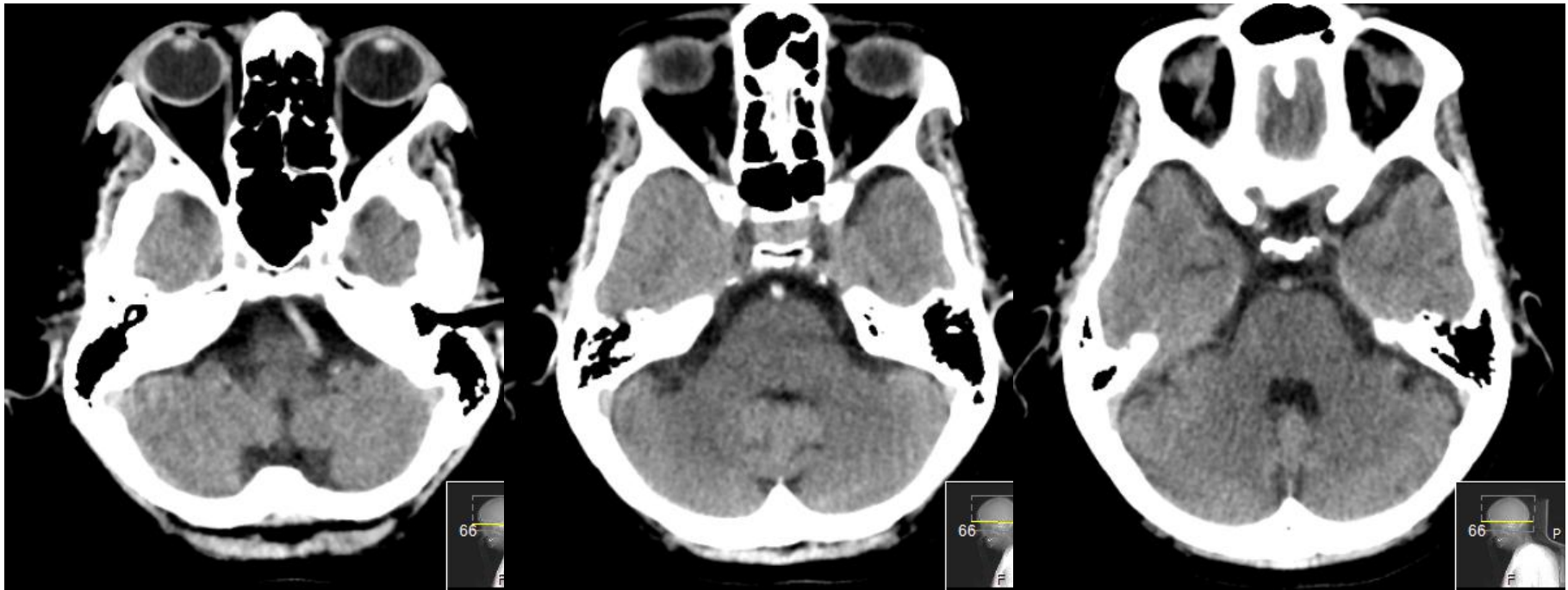
MR

64-årig man

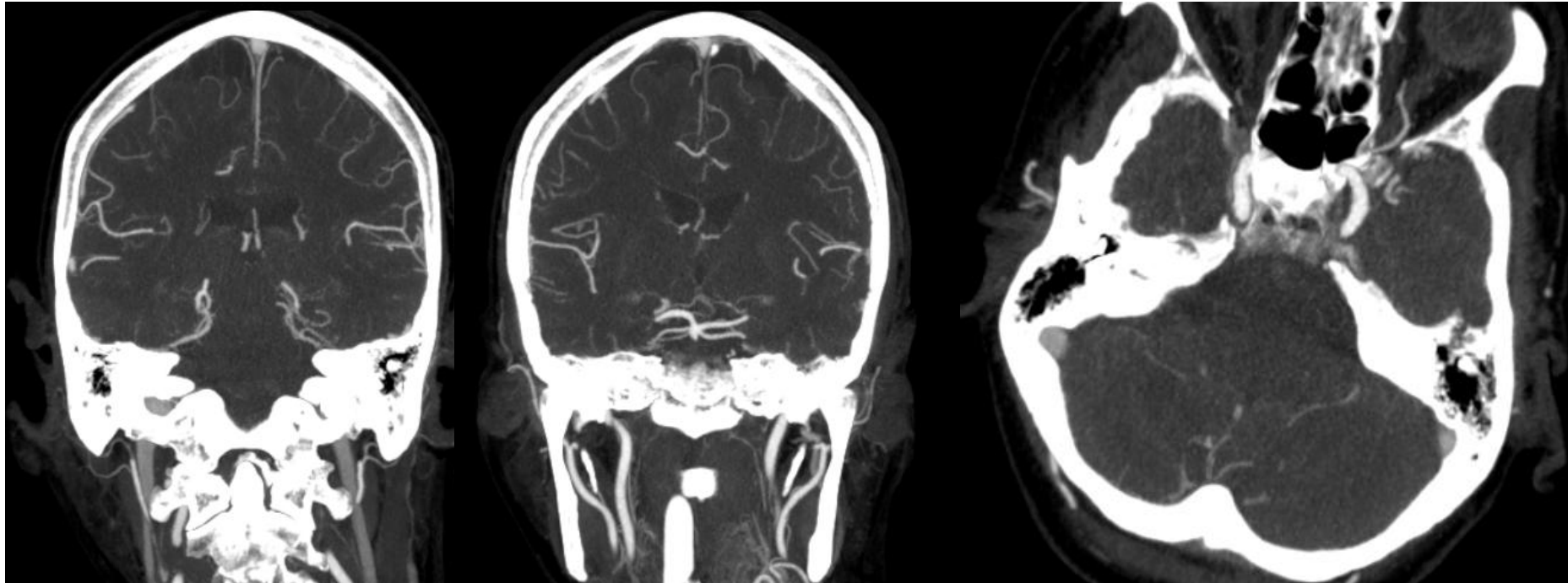
Kramp kl 16:45

GCS 4 vid ankomst till primärsjukhus

DT primärsjukhus kl 18.00:



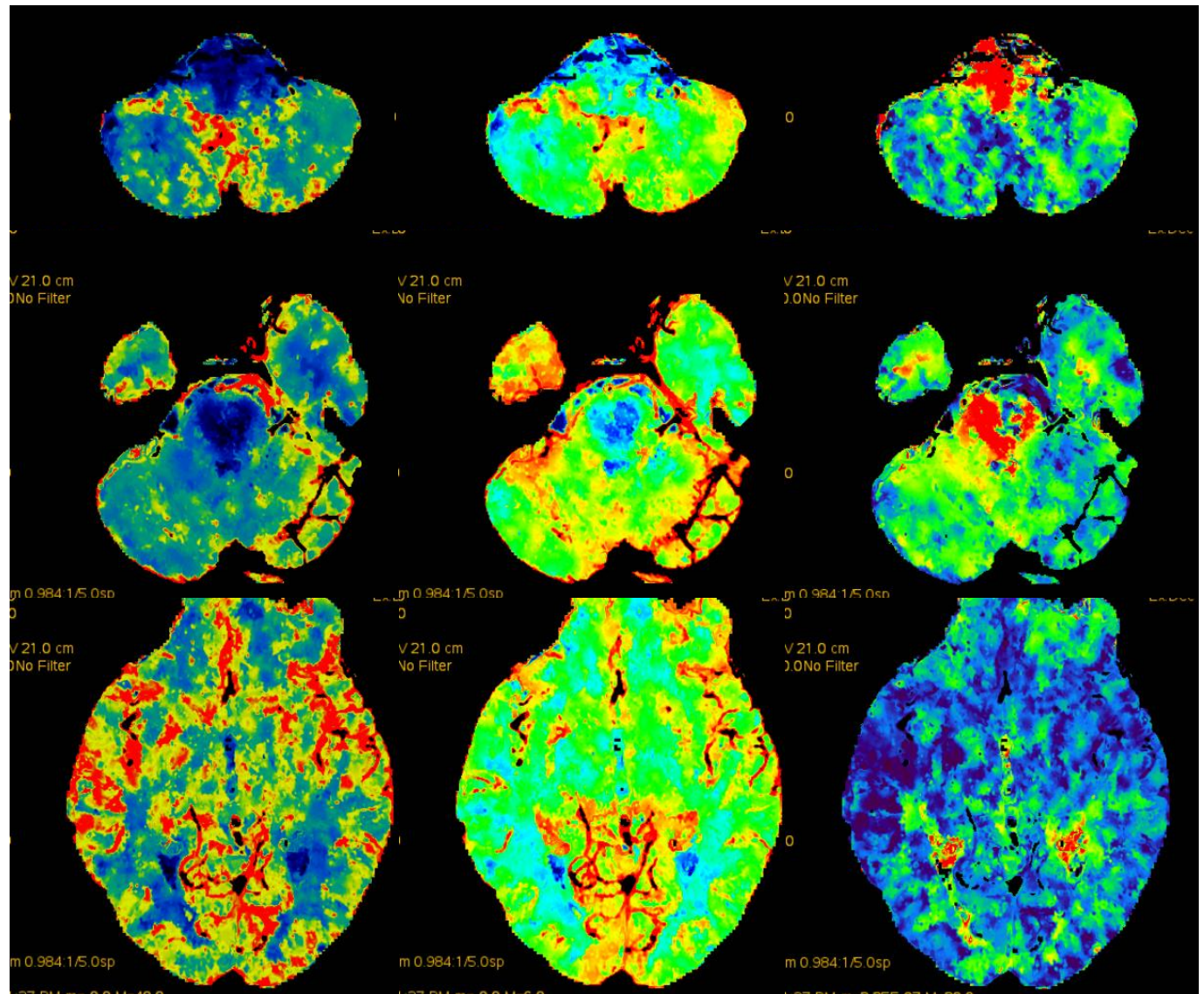
DTA primärsjukhus visar basilarisockklusion:



Intubation. Övertag KS

Perfusion KS
kl 19.41:

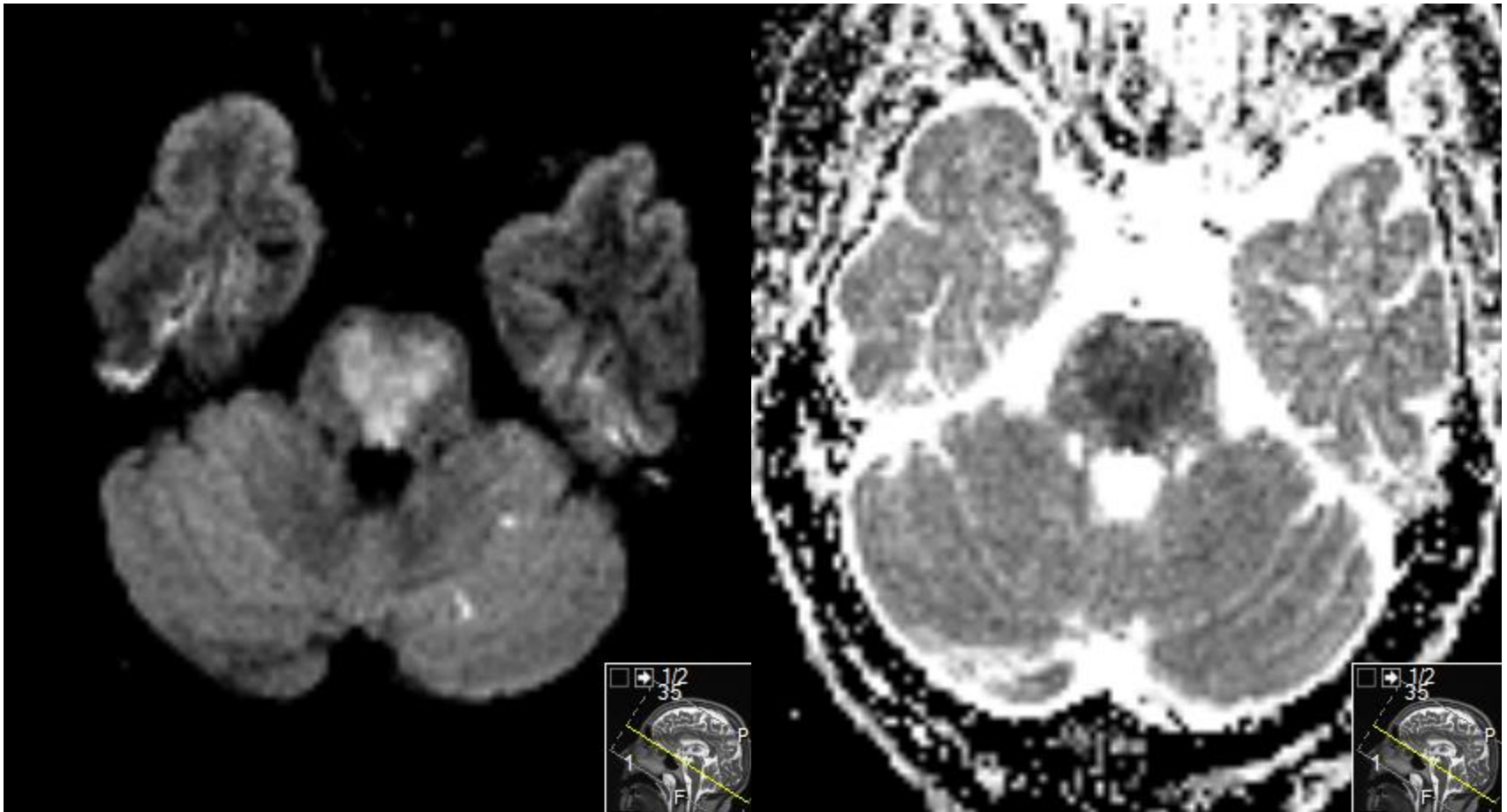
Hjärnstams-
infarkt?



CBF

CBV

MTT



Diffusion

ADC

MR KS kl 20.12 : Omfattande infarkter i hjärnstammen

MR idag:

Medvetslösa patienter där kliniken ej kan
bedömas

Organisatoriskt komplext – men 15 min MR

Tenderar bli exklusionsindikativ

Olika utredningsapproacher:



DT/DTA/DTP → (MR) → Intervention



MR/MRA
DT/DTA → Intervention



DT/DTA/DTP → (MR) → Intervention



MR/MRA → Intervention

Endovaskulär åtgärd: IAT eller trombektomi?



Journal of Stroke 2016;18(2):211-219
<http://dx.doi.org/10.5853/jos.2016.00031>

Original Article

A Comparison between Mechanical Thrombectomy and Intra-arterial Fibrinolysis in Acute Basilar Artery Occlusion: Single Center Experiences

Seunguk Jung,^{a,e} Cheolkyu Jung,^a Yun Jung Bae,^a Byung Se Choi,^a Jae Hyoung Kim,^a Sang-Hwa Lee,^b Jun Young Chang,^{b,e} Beom Joon Kim,^b Moon-Ku Han,^b Hee-Joon Bae,^b Bae Ju Kwon,^c Sang-Hoon Cha^d

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^cDepartment of Radiology, Myongji Hospital, Goyang, Korea

^dDepartment of Radiology, Chungbuk National University College of Medicine, Cheongju, Korea

^eDepartment of Neurology, Gyeongsang National University Changwon Hospital, Changwon, Korea

J of Stroke 2016 18(2):211–219

Singelcenterstudie, 24 fall av IAT och 33 fall av trombektomi:

- Tid för rekanalisering kortare i trombektomigruppen (49 min jämfört 92 min)
- Rekanalisering mer sannolikt i trombektomigruppen (88 % jämfört 42 %)
- Trend ($p=0.06$) för mRS 0-2 bättre i trombektomigrupp (39 % jämfört 17 %)

Konklusion: Fler studier behövs.

Trombektomi

Hårdvaran:

Stent retrievers

Solitaire, EmboTrap,

Capture

Trevo, Opticell mfl

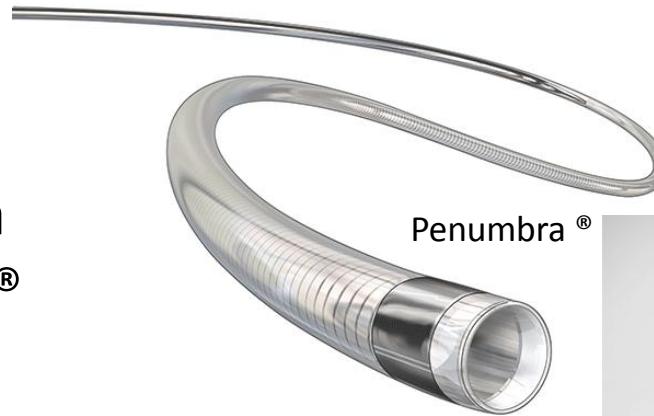
Aspiration

Manuell: 50 cc-spruta

Maskinell: Penumbra®



Stentretriever med lyckad fångst



Penumbra®



Trombektomi – hur gör man?

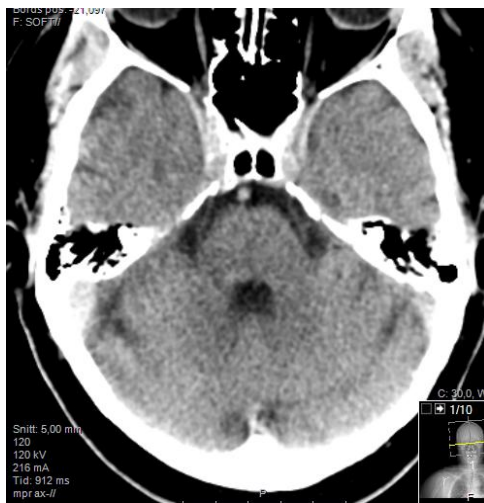
Instick a femoralis, diagnostiska serier över bakre och främre cirkulationen – kollateralcirkulation, utbredning av ocklusion?

6F-system till dominant vertebral

Mikrokateter över mikroledare distalt embolin

Stentretriever över embolin, avvakta 1-5 minuter, därefter trombektomi under aspiration (manuellt eller via penumbrasystem)





KS: tidiga erfarenheter av trombektomi

ORIGINAL RESEARCH

Mechanical thrombectomy as the primary treatment for acute basilar artery occlusion: experience from 5 years of practice

Tommy Andersson,^{1,2} Åsa Kuntze Söderqvist,^{1,2} Michael Söderman,^{1,2}
Staffan Holmin,^{1,2} Nils Wahlgren,^{1,4} Magnus Kaijser^{1,2,3}

J NeuroIntervent Surg 2013 5:221-225

Erfarenheter KS 2005-2010 (pre-NIHSS) baserad på 28 fall utan IVT:

- 64 % rekanalisering
- 10,7 % post-trombektomi ICH, alla asymptomatiska.
- GOS Good (mRS 0-2) 57%
- Mortalitet 3 månader: 21 % (6 pat av 28)

Konklusioner: Trombektomi bättre än trombolys och tidig rekanalisering förbättrar outcome.

Outcome: Trombektomi i basilaris

J Neurol (2016) 263:707–713
DOI 10.1007/s00415-016-8047-x



ORIGINAL COMMUNICATION

Endovascular mechanical thrombectomy in basilar artery occlusion: variables affecting recanalization and outcome

Nicola Gilberti¹ · Massimo Gamba¹ · Enrico Premi¹ · Angelo Costa¹ ·
Veronica Vergani¹ · Ilenia Delrio¹ · Raffaella Spezi¹ · Dikran Mardighian² ·
Michele Frigerio² · Roberto Gasparotti² · Alessandro Padovani³ · Mauro Magoni¹

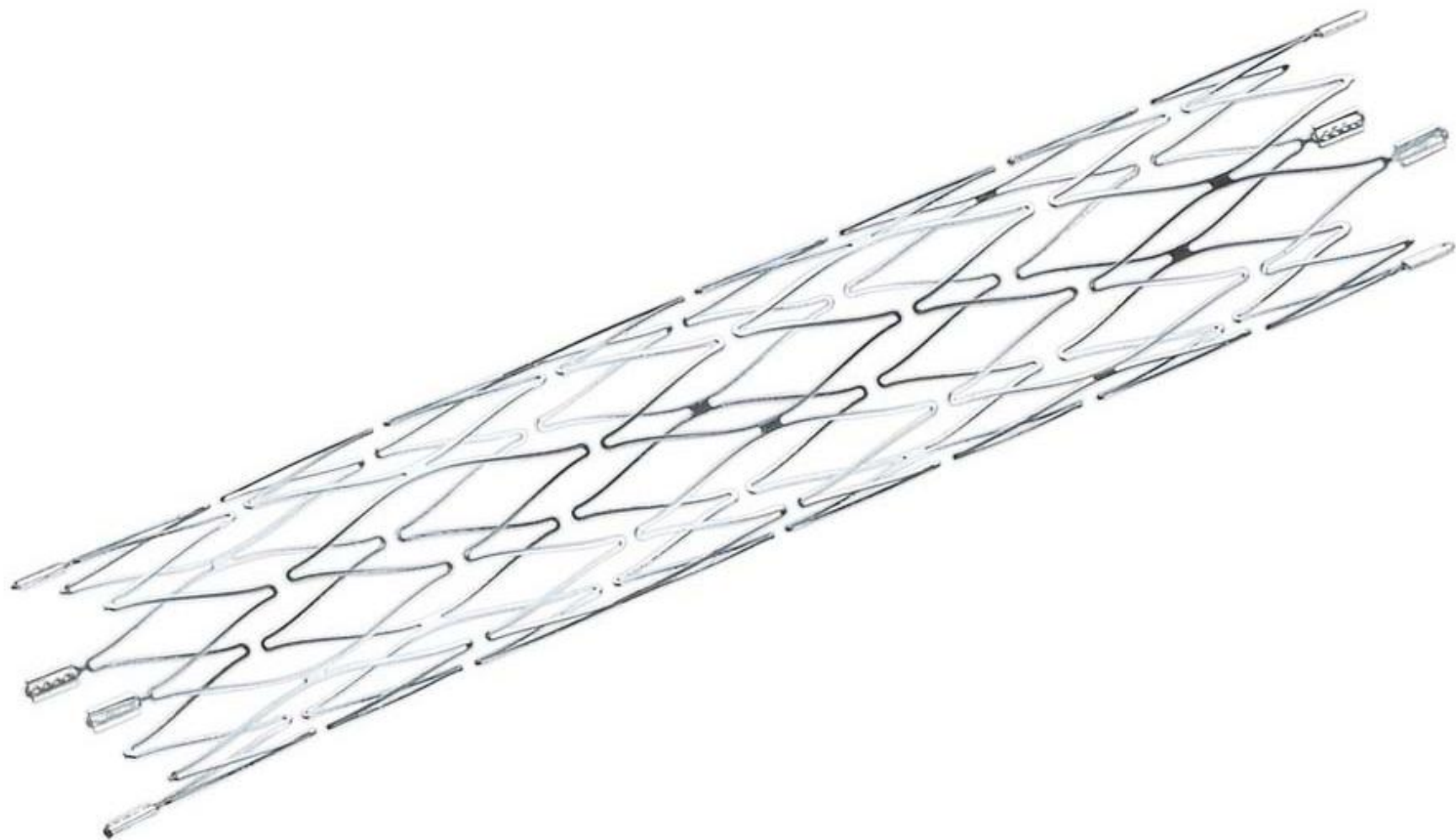
J Neurology 2016 263:707–716

Received: 29 December 2015 / Revised: 21 January 2016 / Accepted: 21 January 2016 / Published online: 12 February 2016
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Singelcenterstudie baserad på 32 fall:

- 87 % rekanalisering
- 6,3 % post-trombektomi ICH
- GOS Good (mRS 0-2) 40.6%
- Mortalitet 3 månader: 25 % (6/32 stor infarkt, 2/32 respinsuff)

Konklusion: Större studier behövs.

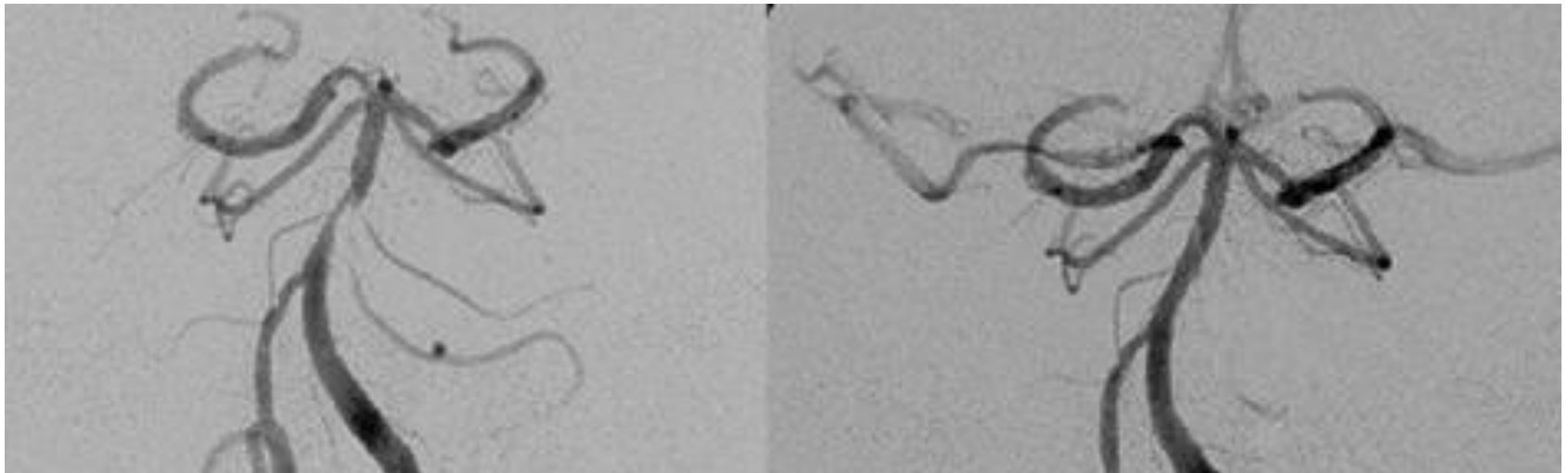
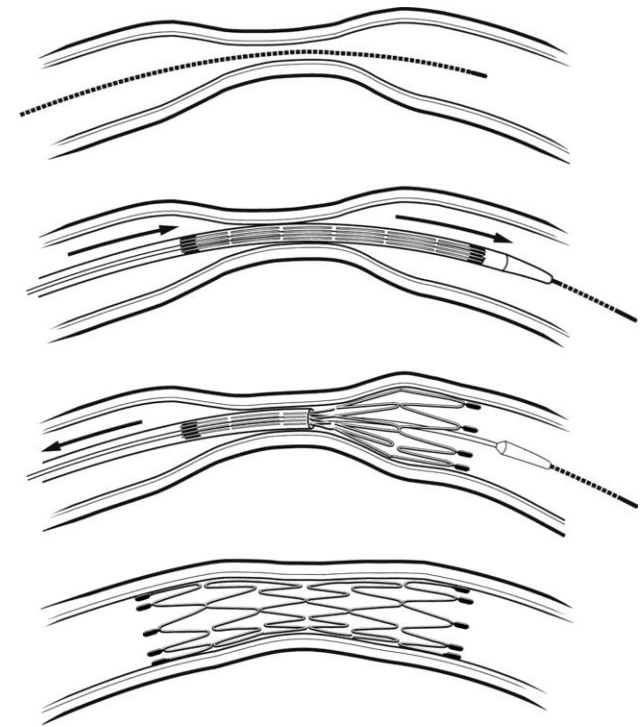


Stentning – hur gör man?

Femoral (radial) accessväg.

Kombination med PTA
(ballongvidgning pre- och/eller
poststentning)

I basilaris risk för perforantskador



Stentning av extrakraniell vertebralisstenos

A Systematic Review of Stenting and Angioplasty of Symptomatic Extracranial Vertebral Artery Stenosis

Aaron N. Stayman, MD; Raul G. Nogueira, MD; Rishi Gupta, MD

Background and Purpose—Extracranial vertebral artery stenosis (ECVAS) is common among patients with ischemic stroke. Despite the limited knowledge of the natural history of patients with symptomatic vertebral disease, endovascular revascularization techniques are now utilized in clinical practice. We sought to determine the risk of endovascular treatment for ECVAS with a systematic review of the literature.

Methods—A search strategy was used using the terms “stenting,” “vertebral,” “ostium,” “origin,” and “extracranial” through Medline. All articles were reviewed along with their references to determine the risk and durability of endovascular treatment.

Results—A total of 27 articles were identified that met inclusion criterion, with a total of 980 of 993 patients treated with stents. The majority of patients (56%) were noted to have contralateral vertebral artery stenosis or occlusion and 92% were symptomatic at the time of treatment. A total of 11 patients (1.1%) experienced a stroke and 8 (0.8%) experienced a transient ischemic attack within 30 days of the procedure. Drug-eluting stents were associated with lower restenosis rates (11%) compared to bare metal stents (30%) at a mean of 24 months of follow-up.

Conclusions—Stenting and angioplasty of ECVAS appear to have a low rate of periprocedural stroke or transient ischemic attack and restenosis rates that may not be as high as suspected. Given the frequency of ECVAS as an etiology for ischemic stroke, future studies aimed at determining efficacy of this treatment modality relative to medical therapy would be of benefit to clinicians caring for these patients. (*Stroke*. 2011;42:2212-2216.)

Key Words: extracranial vertebral artery stenosis ■ stents

Stroke 2011 42:2212–2216

Metaanalys av 27 artiklar/ 980 patienter.

Stentning av extrakraniell vertebralisstenos relativt säkert - 1.1 % strokerisk och 0.8 % TIA-risk vid 30 dygn. Efter stentning sågs infarkt hos 1.3% och symptom hos 6.5% vid 21 månader.

Jämför ej med BMT – framtida studier behövs.

Intrakraniell VA/BA-stenos

ORIGINAL RESEARCH

Stroke recurrence rates among patients with symptomatic intracranial vertebrobasilar stenoses: systematic review and meta-analysis

Ahmad R Abuzinadah,¹ Mohammed H Alanazy,² Mohammed A Almekhlafi,¹ Yanjune Duan,³ Haifeng Zhu,³ Mikael Mazighi,⁴ Helmi L Lutsep,⁵ Tyrone Donnon,⁶ Michael D Hill⁷

J NeuroIntervent Surgery 2016;8:112–116

Metaanalys av 23 artiklar/ 592 patienter.

Generellt större risk för basilarisstenos än för vertebralisstenos.

Risk för nytt stroke eller död inom 6 månader: 14.8/100 personår i BMT jämfört 8.9/100 personår i stentgrupp; ingen signifikant skillnad.

Sekundärprevention

Review

Sekundärprevention:

- Best Medical Treatment : BMT
- Stentning

Ingen randomiserad studie har visat om stentning är bättre /likvärdigt/sämre än BMT.

- Givet hög risk vid stentning av intrakraniell stenosis ses idag BMT som bäst modalitet för intrakraniell stenosis.

Posterior circulation ischaemic stroke and transient ischaemic attack: diagnosis, investigation, and secondary prevention



Hugh S Markus, H Bart van der Worp, Peter M Rothwell

A fifth of all strokes and transient ischaemic attacks occur in the posterior circulation arterial territory. Diagnosis can be challenging, in part because of substantial overlap in symptoms and signs with ischaemia in the anterior circulation. Improved methods of non-invasive imaging of the vertebrobasilar arterial tree have been used in recent prospective follow-up studies, which have shown a high risk of early recurrent stroke, particularly when there is associated vertebrobasilar stenosis. This finding emphasises the importance of urgent secondary prevention, and the role of stenting for vertebral stenosis is being investigated. *Lancet Neurol* 2013; 12: 989-98

Över 90 dagar ses risk för ny TIA/stroke:

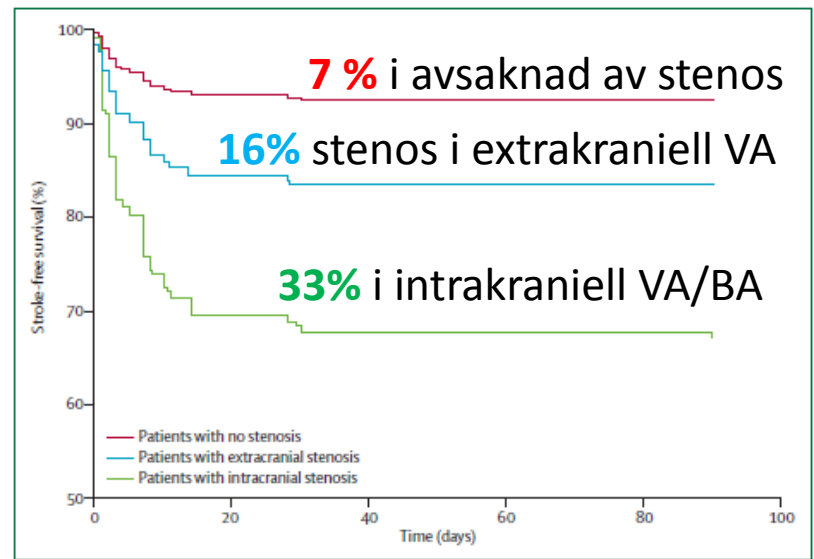


Figure 4: Kaplan-Meier curves of risk of recurrent stroke after posterior circulation stroke and transient ischaemic attack

Lancet Neurology 2013 (12), page 994

I sammanfattning:

- Utred med DT/DTA på primärsjukhus och eventuellt DTP / MR på interventionsenhet.
- Trombektomi i bakre cirkulationen leder ofta till good outcome, men har fortsatt stor risk för mortalitet och morbiditet. Dock, jämfört naturalförloppet och IVT är trombektomi i selekterat material klart bättre.
- Stentning av stenoser i extrakraniella bakre cirkulationen är säkert.
- Givet hög risk vid stentning av intrakraniell stenosis ses idag BMT som bäst modalitet för intrakraniell stenosis.

Men, som alltid: Fler studier behövs.

TACK !

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