

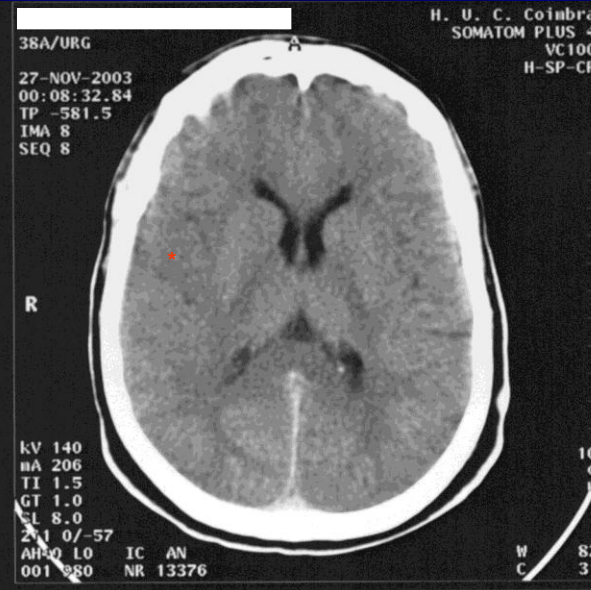
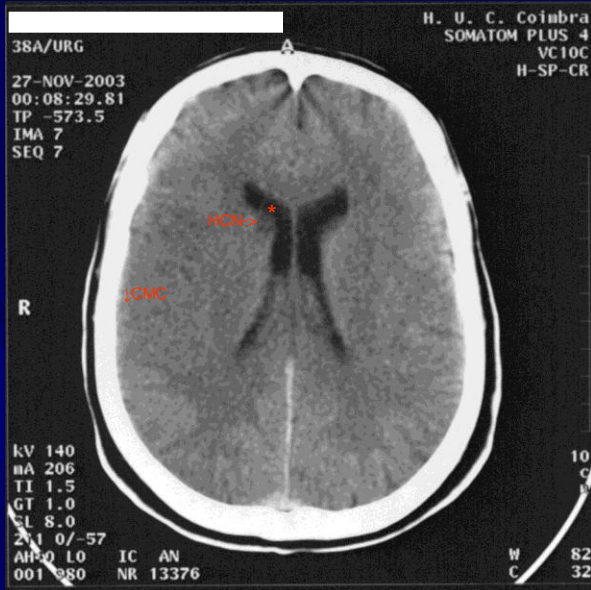
A photograph of a man in a dark jacket and pants walking down a hospital hallway. He is using a metal walker for support. The hallway has light-colored walls, wooden handrails, and fluorescent lights on the ceiling. The man is looking down and slightly to his left.

CIRURGIA DO AVC ISQUÉMICO

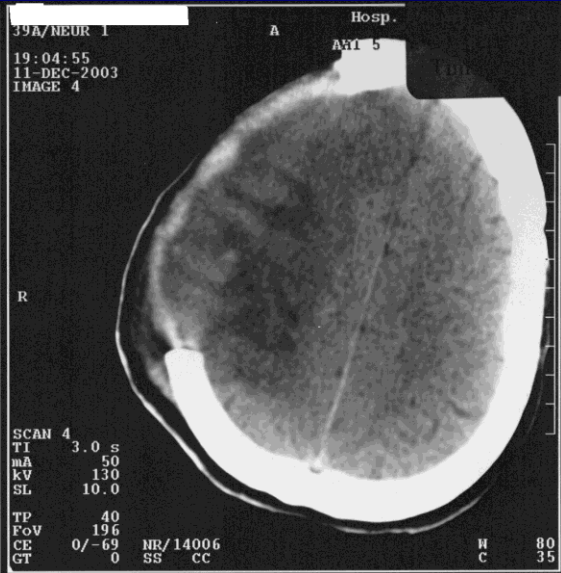
Marcos Barbosa Serviço de Neurocirurgia
Hospitais da Universidade de Coimbra

1º Congresso Português do AVC
Porto, Fev 2007

CIRURGIA NO AVC AGUDO



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AVC ISQUÊMICO

□ SUPRATENTORIAL

CRANIECTOMIA DESCOMPRESSIVA

- redução PIC
- aumento PPC
- preservação FSC

CIRURGIA NO AVC AGUDO

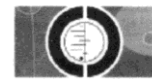
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UPDATE
SOFTWARE

Surgical decompression for cerebral oedema in acute ischaemic stroke

Morley NCD, Berge E, Cruz-Flores S, Whittle IR.

This is a reprint of a Cochrane review, prepared and maintained by the Cochrane Collaboration and published in *The Cochrane Library* 2003, Issue 1



the cochrane library

“não há evidência de estudos randomizados controlados...”

- HEADDFIRST, HAMLET, DECIMAL, HEMMI
- Porquê, quem e quando?

HeaDDFIRST

Hemicraniectomy and Durotomy for Deterioration From Infarction Relating Swelling

Trial Status:

completed

Enrollment began in February 2000 and will conclude January 31, 2002 with the goal of enrolling 75 total patients. Currently, 25 participating centers in North America ready to enroll patients.

Interventions:

Hemicraniectomy

Surgical procedure to reduce intracranial pressure after large hemispheric infarction.

Location(s):

North America

Year Started: 2000

Design:

Multi-center pilot clinical trial with a planned enrollment of 75 patients.

Inclusion Criteria

Occurrence of an acute unilateral middle cerebral artery (MCA) territory ischemic stroke; must meet specific clinical and CT criteria.

Patient Involvement:

All eligible and consenting patients will be registered and subjected to a standardized medical therapy (SMT) protocol. Patients who develop severe brain swelling within 96 hours of stroke onset will be randomized to receive SMT alone or SMT + standardized hemicraniectomy and durotomy.

Primary Outcome:

Assessments of mortality, reportable events, functional outcome, quality of life, caregiving burden, patient perceptions of survivorship, and acute health care utilization measured 21, 90 and 180 days after stroke onset.

HeMMI

Hemicraniectomy For Malignant Middle Cerebral Artery Infarcts

- *Study Size Actual:15*
- *Study Size Planned:56*
- *Max Time from onset:72 Hours*
- *Max Age:65*
- *Min Age:18*
- **Purpose:**
To determine whether hemicraniectomy will improve outcome in patients with malignant middle cerebral artery infarction.
- **Interventions:**
Hemicraniectomy
Surgical procedure to reduce intracranial pressure after large hemispheric infarction.
- **Location(s):**
Philippines
- **Design:**
Open randomized clinical trial.
- **Inclusion Criteria**
Patients diagnosed clinically and radiographically with ischemic stroke in the middle cerebral artery territory
- **Exclusion Criteria**
Patients with a previous disabling neurological disease or a modified Rankin score > 2, Glasgow Coma Scale score of < 5, terminal illness, infarction due to surgical complications or vasospasm, primary intracranial hemorrhage or coagulopathies
- **Patient Involvement:**
Patients medically cleared for possible surgery will be randomized to receive either standard medical treatment or hemicraniectomy with duraplasty. The GCS score and NIHSS score will be monitored daily for the first 7 days, at 2 weeks, at discharge, 1, 3, and 6 months. The modified Rankin score and Barthel Index will be assessed at discharge, 2 weeks, 1, 3, and 6 months.
- **Primary Outcome:**
GCS, NIHSS, modified Rankin score and Barthel Index.

HAMLET

Hemicraniectomy After MCA infarction with Life-threatening Edema Trial

Status:

As of November 2005, 44 patients had been enrolled at 7 centers. Trial is ongoing with a planned enrollment of 112.

Purpose:

To study the efficacy of decompressive surgery to reduce mortality and to improve functional outcome in patients with supratentorial infarction and space-occupying edema.

Interventions:

Hemicraniectomy

Surgical procedure to reduce intracranial pressure after large hemispheric infarction.

Year Started: 2002

Design:

Multi-center, open, randomized clinical trial of 112 patients.

Inclusion Criteria

Space-occupying infarct in the territory of the middle cerebral artery in either hemisphere leading to a decrease in consciousness

Patient Involvement:

Patients will be randomized to either decompressive surgery, consisting of a large hemicraniectomy and a duraplasty, followed by intensive care treatment, or conservative treatment, consisting of either intensive care treatment or 'standard' therapy on a stroke unit. Randomization will be stratified according to the intended mode of conservative treatment.

Primary Outcome:

The primary outcome measure is functional outcome according to the modified Rankin Scale at one year.

Secondary Outcome:

Other outcome measures include the Barthel Index, the NIH Stroke Scale, the Montgomery and Asberg Depression Rating Scale, and quality of life as determined by the SF36 as well as a visual analogue scale.

DECIMAL

DEcompressive Craniectomy In MALignant Middle Cerebral Artery Infarcts Status:

As of December of 2004, 32 patients had been enrolled at 13 French centers. Recruitment is ongoing.

Purpose:

To assess the efficacy of decompressive hemicraniectomy and duroplasty in patients with malignant middle cerebral artery (MCA) artery infarcts.

Location(s):

France

Year Started: 2001

Design:

Sequential design, multi-center, randomized, controlled trial.

Inclusion Criteria

Patients who present within 24 hours of a malignant MCA infarct - a severe ischemic hemispheric stroke (NIHSS > 15, altered level of consciousness and brain CT ischemic early signs > 50% of the MCA territory) and a DWI infarct volume > 145 cm³.

Patient Involvement:

Patients will be randomly assigned to either receive standard treatment alone or in combination with decompressive hemicraniectomy and duroplasty.

Primary Outcome:

Modified Rankin Score < 4 at 6 months.

Secondary Outcome:

NIHSS, modified Rankin Scale, Barthel Index and quality of life measured by Stroke Impact Scale at 6 months and 1 year

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- mortalidade do edema maligno 80%
- tratamento conservador pouco eficaz
- aumento da sobrevivência
- bons resultados funcionais

CIRURGIA NO AVC AGUDO

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- critérios preditivos de agravamento
 - clínicos
 - imagiológicos

CIRURGIA NO AVC AGUDO

AVC ISQUÊMICO

□ SUPRATENTORIAL

- critérios clínicos de diagnóstico:
estado consciência, hemiplegia (afasia), anisocória,
desvio óculo-cefálico....
- critérios clínicos de previsibilidade:
NIHSS ≥ 20
TAs ≥ 180 mmHg
náuseas/vômitos

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critérios imagiológicos

	Especificidade	Sensibilidade
▪ Hipodensidade >67%	100 %	45.2 %
▪ Hipodensidade >50%	93.5 %	58.1 %
▪ Edema hemisférico	100 %	12.9 %
▪ Desvio linha média	96.7 %	19.4 %
▪ Hiperdensidade ACM	83.9 %	70.9 %
▪ Compressão espaço subaracnoideu	29 %	100 %
▪ Atenuação contraste cortico-medular	96.8 %	87.1 %

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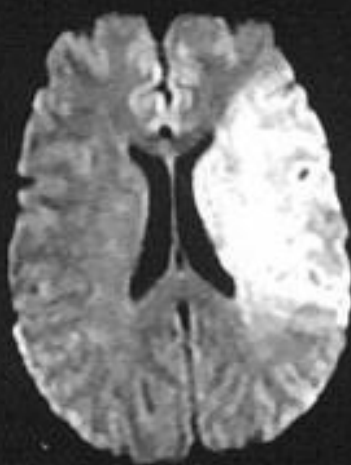
critérios imagiológicos

- TAC difusão

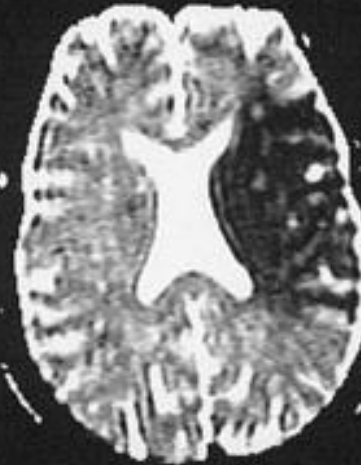
- RM difusão/perfusão



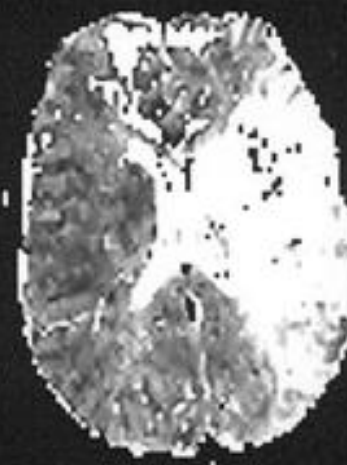
T2-WI



DWI



ADC



TTP



MRA

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- selecção para cirurgia

 - idade

 - envolvimento de outros territórios

 - hemisfério dominante

 - EG, sexo, anisocória

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□ SUPRATENTORIAL

- quando operar ?

80% → 16% → 34,4 %

melhoria dos resultados funcionais

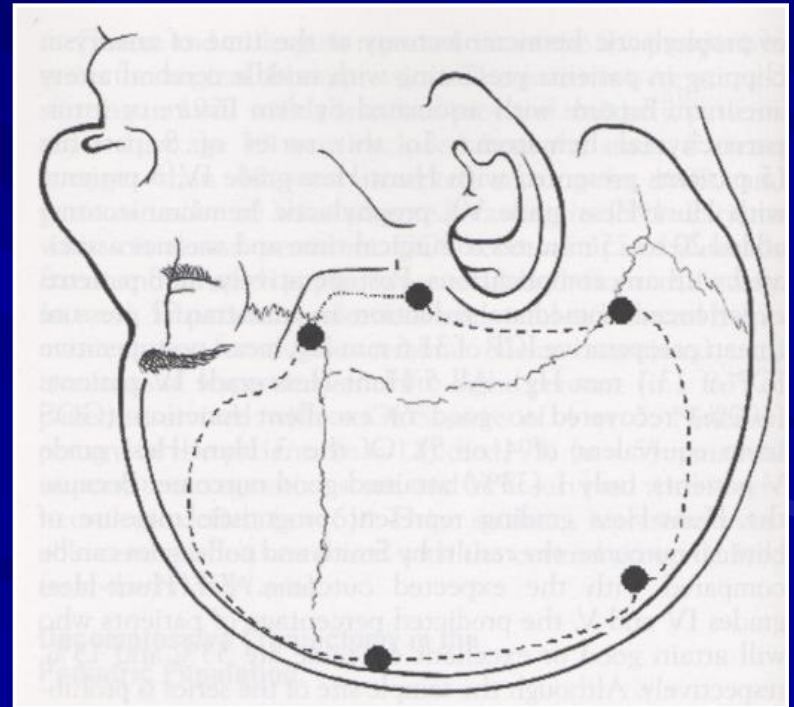
(Schwab S et al, *Stroke* 29:1888-93, 1998)

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- técnica cirúrgica
 - extensão da craniotomia
 - abertura da dura
 - duroplastia
 - cranioplastia



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- complicações (10-18%)
 - transformação hemorrágica
 - hemorragias (hic,hsd,hed)
 - meningite
 - higroma
 - hidrocefalia

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□ SUPRATENTORIAL

- resultados (mortalidade)

16-33% com cirurgia

62-80% sem cirurgia

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AVC ISQUÊMICO

□ SUPRATENTORIAL

- resultados (mortalidade)

idade ≤ 50 anos versus > 50 anos ($p = 0.02$)

ACM versus ACM + adicional ($p = 0.01$)

(Uhl E et al, *J Neurol Neurosurg Psychiatry* 75:270-4, 2004)

CIRURGIA NO AVC AGUDO

AVC ISQUÉMICO

□ SUPRATENTORIAL

- resultados (funcional)

I. Barthel $>70 = 24,2\%$; $\leq 70 = 75,8\%$

GOS 1-2 = $19,7\%$; GOS 3 = $47,9\%$; GOS 4 = $1,6\%$

≤ 50 anos GOS 1-2 = $34,9\%$

>50 anos GOS 1-2 = 12% ($p < 0.0003$)

(Uhl E et al, *J Neurol Neurosurg Psychiatry* 75:270-4, 2004)

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□ SUPRATENTORIAL

- resultados (funcional)

cirurgia precoce com melhores resultados

funcionais que cirurgia tardia ($p < 0.05$)

(Mori K et al *Surg Neurol* 62:420-9, 2004)

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Neurological recovery after decompressive craniectomy for massive ischemic stroke

Cheung A , et al

Neurocrit Care. 2005;3(3):216-23

“the evidence of functional recovery in peri-infarct regions suggests that decompression alone may be preferable to strokectomy where the risk of damage to adjacent nonischemic brain may be greater”.

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AVC ISQUÉMICO

Factors affecting the outcome of decompressive craniectomy for large hemispheric infarctions

Kilincer C, et al

Acta Neurochir (Wien). 2005 Jun;147(6):587-94

“...life-sparing procedure that sometimes yields good functional outcomes. A dominant hemispheric infarction should not be an exclusion criterion when deciding to perform this operation. Early operation and careful patient selection based on the above-mentioned factors may improve the functional outcome of surgical management for large hemispheric infarction”.

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Is decompressive craniectomy for malignant middle Cerebral artery territory infarction of any benefit for elderly patients?

Yao Y , et al

Surg Neurol. 2005 Aug;64(2):165-9

“decompressive craniectomy in younger patients with malignant MCA territory infarction improves both survival rates and functional outcomes. Although survival rates were improved after surgery in elderly patients, functional outcome and level of independence were poor”.

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Outcome after decompressive craniectomy in patients with severe ischemic stroke.

Harscher S, et al

Acta Neurochir (Wien). 2006 Jan;148(1):31-7

“our small observational, retrospective study suggests that hemicraniectomy in patients with space occupying MCA-infarction decreases mortality rate and increases functional outcome”.

CIRURGIA NO AVC AGUDO

AVC ISQUÉMICO

Decompressive craniectomy for ischemic stroke

Matsuura D, et al

No To Shinkei. 2006 Apr;58(4):305-10

“...comprehensive evaluations, including satisfaction scale and QOL assessment necessary to decide the indication of decompressive craniectomy for ischemic stroke.

Although many patients were severely disabled, 79% of the patients and their family answered that having operation was correct choice”

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CONCLUSÃO

craniectomia descompressiva salva vidas e proporciona boa qualidade de vida numa grande proporção de casos, especialmente nos doentes mais novos

necessidade de se estabelecerem protocolos (unidades de AVC)