



15th Symposium of the International Society
of Cardiovascular Infectious Diseases
June 3rd, 2019

Endocarditis and stroke: Acute management



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Vignette : TIV& TEV who bled: ...

- ◆ IPP 3051872 (BALIDEMIC, 41years) → later also develops brain abscesses; MRS à 3m = 4
- ◆ Mme Pernet, IPP 87172 : endocarditis, inhosp stroke : LMCA occlusion → Dr Uske : thrombectomy → 14d later acute HA with L Sylvien SAH → large local mycotic aneurysm → **see other PPT presentation**

Monday June 3, 2019, morning

From 08:30	Registration
09:30 - 10:40	Session V: Neurologic issues <i>Moderators: Urs Fischer (CH), Christine Selton-Suty (FR)</i>
09:30 - 09:55	S09 - Endocarditis and stroke: imaging findings <i>Marwan El-Koussy, University of Bern, Switzerland</i>
09:55 - 10:20	S10 - Endocarditis and stroke: acute management <i>Patrik Michel, University Hospital of Lausanne (CHUV), Switzerland</i>

Disclosures last 2 years

P. Michel, MD

I have a  bank account.

Financial support, all used for research and education :

- ◆ **Research grants:** Swiss National Science Foundation, Swiss Heart Foundation, ERISTA program (BMS/Pfizer)
- ◆ **Consulting fees:** Medtronic
- ◆ **Steering committees :** BASICS, ELAN, CLOSE, PROMISE, Intl. PFO Consortium

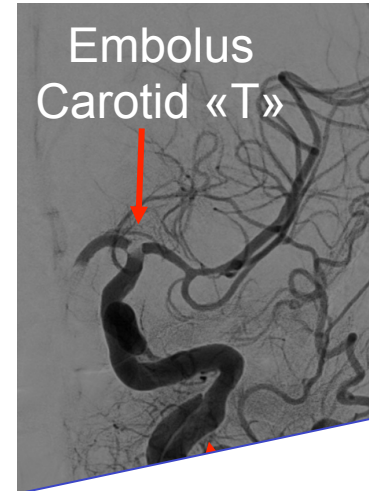
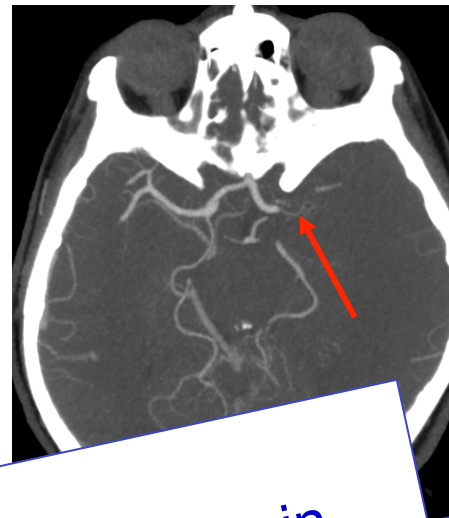
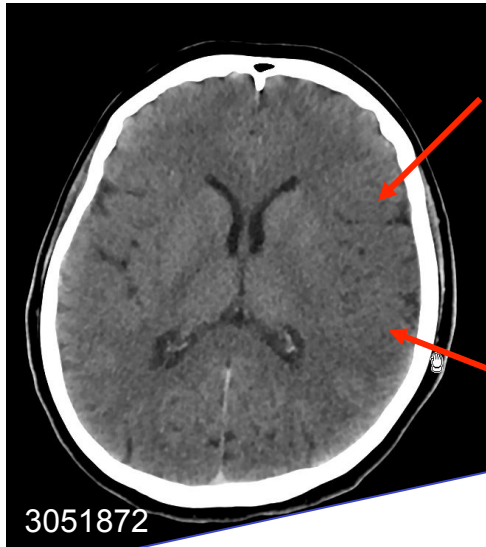
Vignette : 40 y.o. women, 4 children

History and exam

- ◆ Since 2 months; coughing , «bronchitis»
→ Various antibiotics
- ◆ 01.07.2014 at 11h: acute onset speech problems,
right hemiparesis
→ Local hospital → Stroke center (CHUV)



40 y.o.: acute CT and angio-CT



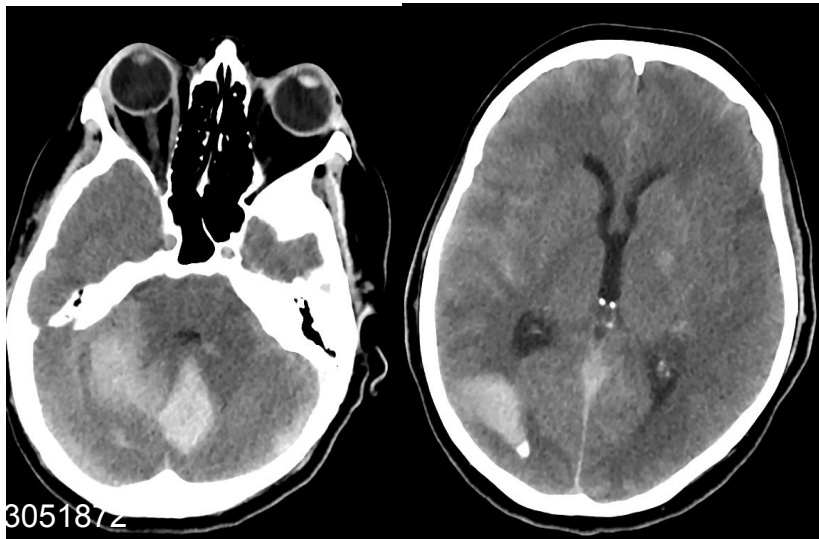
→ Thrombolysis at 134 min.

Embolus
Carotid «T»

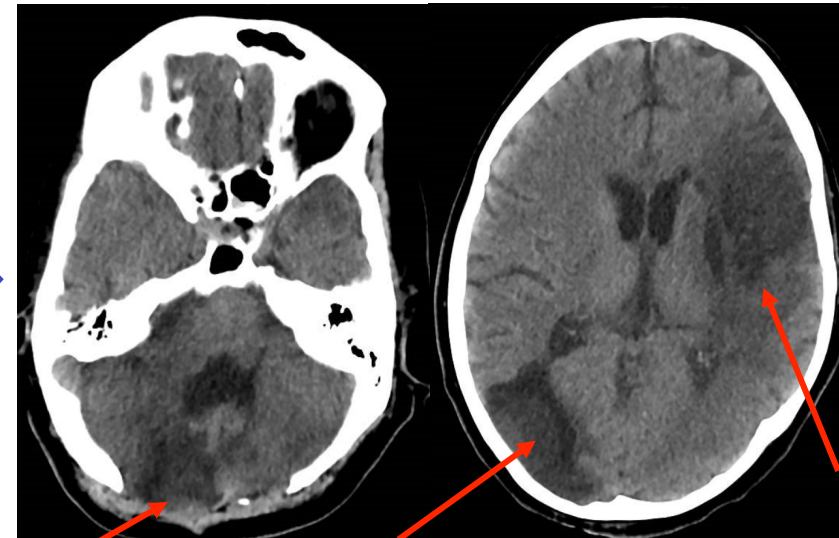
→ Thrombectomy at 220 min.

Carotid artery
dissection

40 y.o. woman : further course



- ◆ Extubation impossible (coma)
- ◆ Multifocal haemorrhage from thrombolysis
- ◆ Haemoculture + (Strep. mitis)



- Posterior craniectomy
- Brain abscess → multiple scars
- 12 months: severely handicapped

Endocarditis and the nervous system

Multiple manifestations

- ◆ Cerebrovascular
 - Ischemic > hemorrhagic > aneurysms
- ◆ Infectious
 - Brain/epidural/subdural abscess, cerebritis
 - Meningitis, spondylodiscitis
- ◆ Systemic
 - Encephalopathy (confusion)
 - Seizures



→ The brain is on fire ...



Endocarditis & stroke

Menu



- ◆ Neurological manifestations of endocarditis
- ◆ Frequency, prognosis
- ◆ Rapid diagnosis of endocarditis-related strokes
- ◆ Acute revascularisation treatments for ischemic stroke
- ◆ Acute management of stroke
 - Antithrombotics (antiplatelets, anticoagulation)
 - Valve surgery and the brain
 - Infective (mycotic) aneurysms



Endocarditis & stroke

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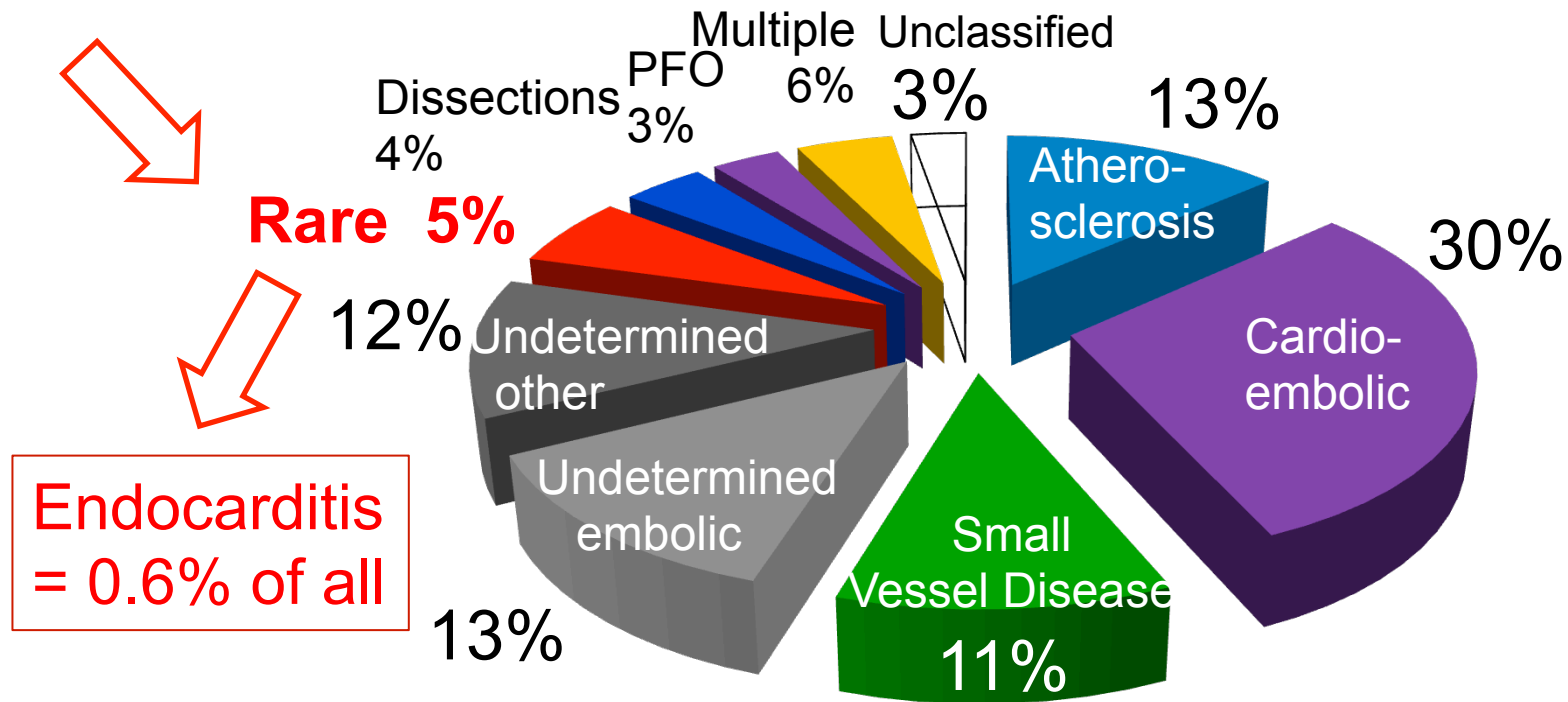
Endocarditis & stroke

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Frequency of endocarditis as the cause of 445 consecutive acute ischemic strokes at CHUV (2003-6/2017)



Modified TOAST classification, standardized workup

Source: *ASTRAL*

Michel & Eskandari, unpublished

Endocarditis and the brain

- ◆ 25% of all endocarditis have neurological manifestations
 - Most are strokes
 - Increase mortality
- ◆ 50-70% have neuro-radiological manifestations
 - Many are invisible time bombs



Endocarditis and the brain

Stroke is the most frequent manifestation

Ischaemic stroke
from ...

→ Septic emboli



Scylla and Charybdis

Haemorrhagic stroke from ...

- Transformation
- (Micro-) vasculitis
- Infective (mycotic) aneurysms

Acute ischemic stroke from endocarditis

 Experience with prognosis 1/2003 – 03/2019 (N=5260)

At 3 months :

- ◆ 64 % had poor outcome
- ◆ 36 % died

} Twice the rate of other
ischemic strokes



Endocarditis & stroke

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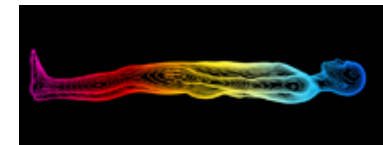
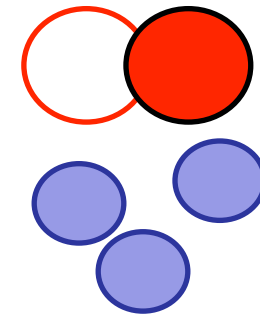
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When to suspect endocarditis as the cause of stroke ?



- ◆ Simultaneous **ischemic and haemorrhagic** strokes
- ◆ **Multifocal/recurrent** stroke without evident cause
- ◆ Presence of a **systemic inflammation/signs**
- ◆ Presence of a **cardiac signs**

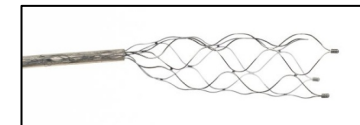
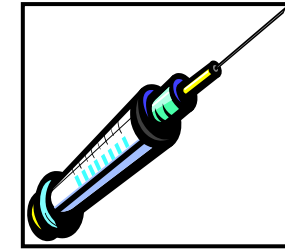




Endocarditis & stroke

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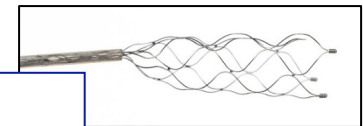
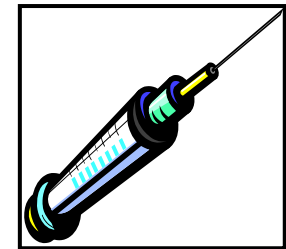
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Revascularisation from ischemic stroke from endocarditis: risk of haemorrhage



- ◆ IV thrombolysis :
 - Large US cohort : 20% haemorrhage rate (44/222)
 - CHUV: 30% haemorrhage rate (2/6)
- ◆ Direct thrombectomy :
 - Literature: <10% haemorrhage (N ~ 20)
 - CHUV: 12% (1/8)



Recommendations :

- No thrombolysis if endocarditis known or suspected
- Thrombectomy may be considered

Ischemic stroke from endocarditis

CHUV Experience with revascularisation



- ◆ Half (14/31) had acute revascularisation

- 4 IV thrombolysis → 1 sympt. haemorrhage
- 2 IV (&endovascular) → 1 sympt. haemorrhage

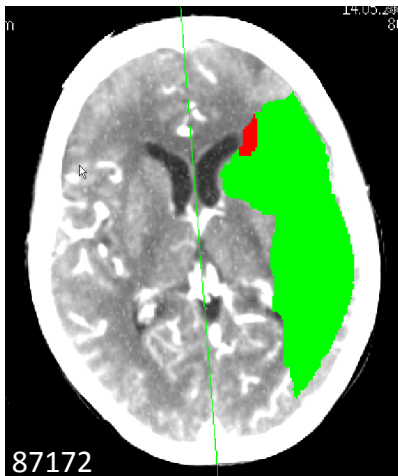
Thrombolysis:
1/3 with
hemorrhages

- 8 direct endovascular → 1 sympt. haemorrhage

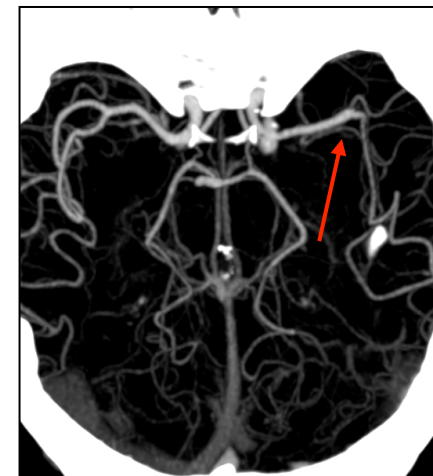
Thrombectomy:
seems
acceptable

Ex.: 46 y.o. lady: endovascular treatment

- ◆ Strep. mitis endocarditis; HIV+
- ◆ Acute in-hospital stroke left hemisphere



Angio-
plasty



CT and angio-CT

→ Recanalisation

46 y.o. lady: day 14: acute headache
→ Repeat CT



Subarachnoid
hemorrhage



Aneurysm
at site of angioplasty

Infective (~~mycotic~~) aneurysms in bacterial endocarditis

- ◆ 2-4% of endocarditis; aneurysms small and distal
 - Mostly silent
 - Others: intracerebral and subarachnoidal haemorrhages
- ◆ Diagnosis : search aneurysms only in endocarditis patients with brain symptoms
 - If ischemic stroke, seizures etc: do MRI / MRA (or CT/CTA) → Sensitivity ~ 35%
 - If haemorrhage : do conventional cerebral angiography



Erdogan
Tex Heart Inst J. 2004





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Acute management of stroke in endocarditis

- ◆ Randomized controlled trials: N = zero
- ◆ Consensus guidelines usually recommend : « Individualize »
 - 1) « Balance the benefits and risks »
 - 2) « Discussion in multidisciplinary teams »





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Antithrombotics in endocarditis

Protecting or damaging ?



Olympic Museum Lausanne

Antithrombotics in endocarditis



In general contra-indicated for ~2 weeks after the diagnosis

Absolute «NO» :

- Intracranial hemorrhage
- Large ischemic stroke
- Untreated infective aneurysms

Still may consider :

- Pretreatment with antiplatelet
- Intracardiac thrombus
- Mechanical valves
- Recent coronary stents, DVT/ pulmonary emboli





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Cardiac valve surgery in endocarditis

Balance between benefits and risks



Reasons to speed up :

- Cardiac instability
- Large/multiple valve vegetations
- Recurrent (minor) ischemic strokes

Reasons to delay by 2-4 weeks

- Intracranial hemorrhage
- Large ischemic stroke



Baddour/AHA Circulation 2015; Habib Eur Heart J 2015
García-Cabrera Circulation 2013; Chu Circulation 2015



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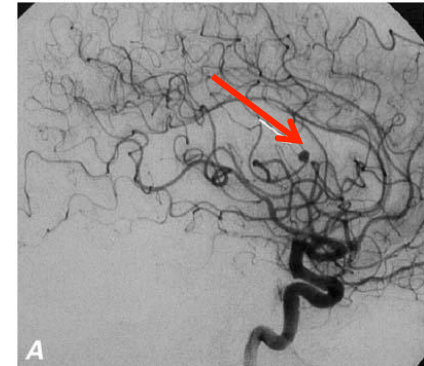
Infective aneurysms

Treatment

- ◆ Ruptured = haemorrhage → **Intervention**
 - Endovascular : coiling, arterial occlusion
 - Surgical: excision, clipping, trapping
- ◆ Unruptured → **Antibiotics**
 - Control MRI at 2-4 weeks



**Significant rate
of complications**



Erdogan
Tex Heart Inst J. 2004

Endocarditis & brain: conclusions

- ◆ Neurological manifestations in endocarditis
 - Bad news for the brain and the patient
- ◆ Acutely : avoid thrombolysis. Thrombectomy: OK
- ◆ Management :
 - Avoid antithrombotics for ~ 2 weeks
 - Postpone valve surgery for ~ 2 weeks (if possible)
 - Aneurysms : little time bombs → intervene if sympt.
- ◆ Need joint international registries and RCT



