Modern concepts of syringomyelia diagnostics & treatment

Florian Roser
"I am Gaius Mucius, a citizen of Rome. I came here as an enemy to kill my enemy, and I am as ready to die as I am to kill. We Romans act bravely and, when adversity strikes, we suffer bravely."

"Watch this," he declared. "so that you know how cheap the body is to men who have their eye on great glory."
Cavalier King Charles Spaniel

- 50% Incidence of Chiari Malformation
- 35% chronic pain
- surgery - decompression
Comparison to chronic illnesses

SF-36 score, 350 patients
Course of symptoms

400 patients, F/U mean 2.5 years (6mo – 12y)

Evaluation of quality of life parameters in patients who have syringomyelia

C. Sixt, F. Riether, B.E. Will, M.S. Taragiba, F. Roser*

Department of Neurosurgery, University of Tübingen, Hugo-Szycher-Straße 3, 72076 Tübingen, Germany

Clinical Study

Journal of Clinical Neuroscience

Contents lists available at ScienceDirect

journal homepage: www.elsevier.com/locate/jocn
Pathophysiology

Venturi - effect

Greitz D., Neurosurg Rev. 2006
Pathophysiology
Syringomyelia or hydromyelia?

Defining the line between hydromyelia and syringomyelia. A differentiation is possible based on electrophysiological and magnetic resonance imaging studies.

Florian Roser · Florian H. Ebers · Carolina Sitt ·
Jeanette Müller · Hagen · Marcus S. Tzagibas
Strategies

Step 1: History is Everything

Step 2: treat Syringomyelia as a Symptom
- there is (no) idiopathic Syringomyelia -

Step 3: Find the Pathology

Step 4: Treat the Pathology
Work-up

- detailed history
  (meningitis, mild spinal trauma)
- neurological workup
  (dissociative symptoms)
- Neuroradiological diagnostics
  MRI - T2 sag
  T1-Gadolineum enhanced
  CINE - MRI
  3D-CISS axial
  CT - post-Myelo CT axial 0.8mm

- Electrophysiology
  SEP (N20-C₂, N20-C₇, und N20-Erb)
  MEP
  Silent periods (CSP, MNSP, CoSP)
Three-dimensional constructive interference in steady-state magnetic resonance imaging in syringomyelia: advantages over conventional imaging

Florian Roser, M.D., Ph.D.,¹ Florian H. Ehner, M.D.,¹ Sören Danz, M.D.,² Felix Riether, M.D.,¹ Rainer Ritz, M.D.,¹ Klaus Dietz, M.D., Ph.D.,¹ Thomas Naegeli, M.D., Ph.D.,³ and Marcos S. Tatagiba, M.D., Ph.D.,¹

Departments of ¹Neurosurgery, ²Neuroradiology, and ³Medical Biometry, University of Tübingen, Germany

primary axial CISS - Acquisition

multi-planar reconstructed axial CISS
Anatomical basics

Corticospinal tract

Dorsal columns

SEP

MEP

Corticospinal tract
Anatomical basics
Anatomical basics
CSP - setup

Pain stimulus (80-100 mA)
Significance of silent periods

A new concept in the electrophysiological evaluation of syringomyelia

Florian Roser, M.D., Ph.D., Florian H. Einer, M.D., Marina Liebsch, Klaus Dietz, M.D., Ph.D., and Marcos Tataria, M.D., Ph.D.

Departments of Neurosurgery and Medical Biometry, University of Tübingen, Germany

exemplarily for two typical syrinx-symptoms compared to standard electrophysiological parameters
Syringomyelia

intramedullary tumour

meningitis

Chiari Malformation
Cervicale Syrinx bei Chiari Typ I

Pre OP  Post OP  F/U 2y
Cervicale Syrinx bei Chiari Typ I

Pre OP   F/U 2y   F/U 2y
Hemangioblastoma
Clinical cases

- T2-gew. sagittal 3 mm
- CISS sagittal 0.7 mm
- Strong flow-void
- Arachnoidal Adhesion
- Compression of dorsal root
Clinical cases

- T2-gew. sagittal 3 mm
- Arachnoid cyst
- CISS sag. 0.7 mm
- Intra-op view
- MRT 2nd day
- 12 month FU
Clinical cases

T2 sagittal

CISS sagittal 0.7mm

arachnoid scar

intra-operative view

3rd post-op day
traumatic syringomyelia

Incidence: ~ 50%
Latency: 3 - 15 years

- don’t forget if neurological deterioration !!
- initial spondylodesis of fractures reduces incidence of PTS
alternative methods

- no primary therapeutic option
- no causal therapy

- indicated only in rapid neurological deterioration and no chance to find pathology
alternative methods

teflon deposits into the syrinx cavity
all syringomyelia...?

AV-Fistula  Ependymal cyst  funicular myelosis  cervical myelopathy

Syrinx...?