



# Syringomyelie

Fortschritte in  
Diagnostik  
und Therapie

U.M. Mauer



Armed Forces Hospital Ulm,  
Dept. Neurosurgery

# Definition

???



# Symptome

Typisch:

Gestörtes

Kalt-Warm-Empfinden

Gestörtes

Schmerzempfinden,

Aber:

Oft unerklärliche Schmerzen

Oft unerklärliche Ausfälle



**Mucius Scaevola überzeugt Porsenna  
(508 v. C.)**





Entstehungsmechanismen  
nur 3 akzeptiert !

Behinderung Pulsation  
Liquor !!!

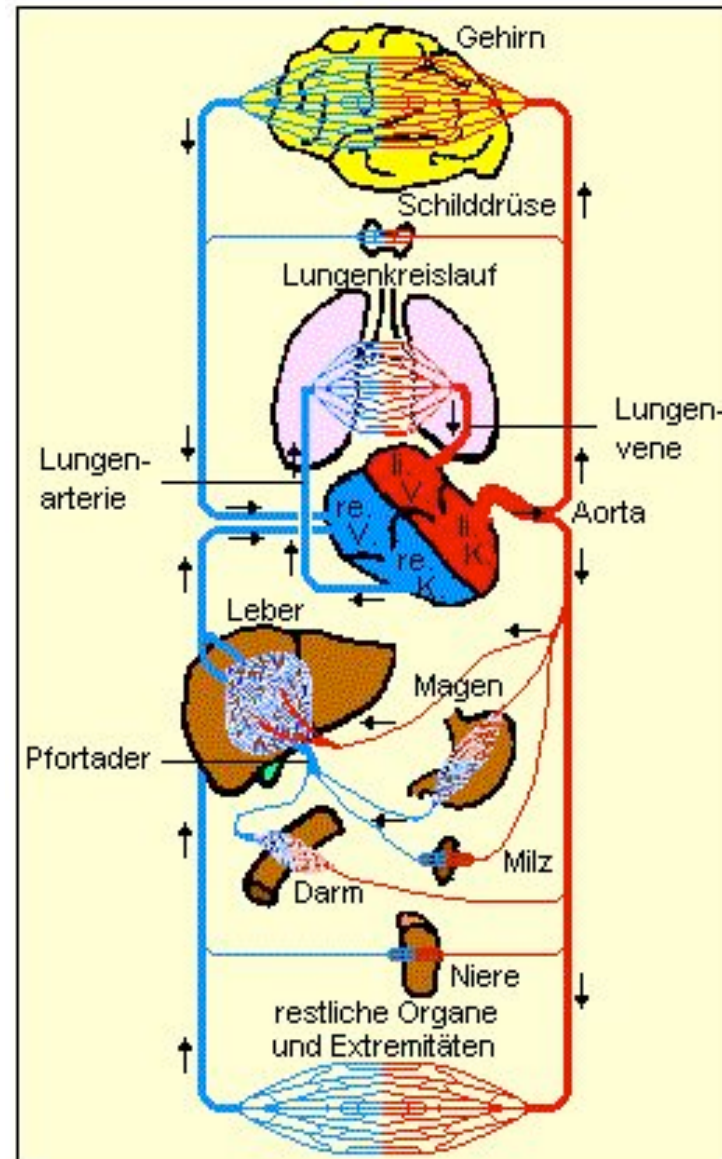
nicht eigenständig !!!

verstanden ???

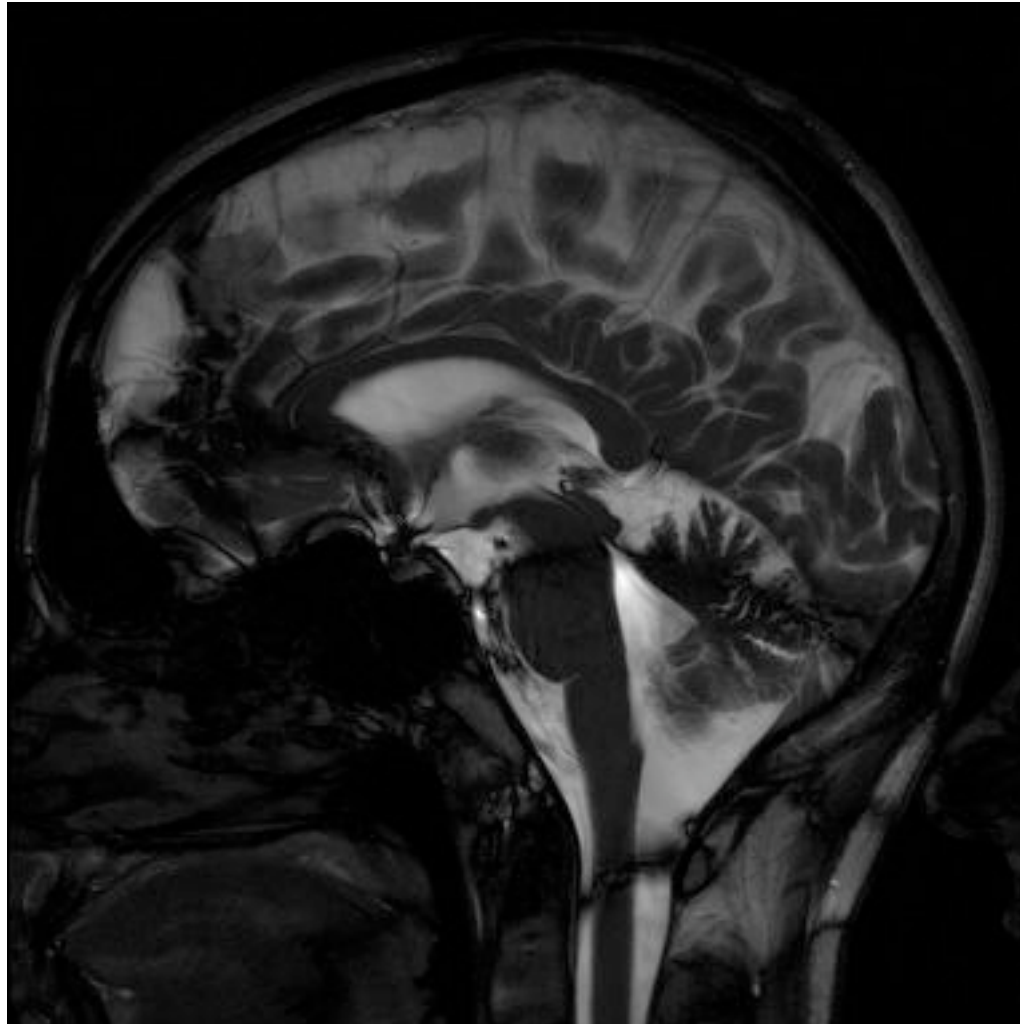


# Entstehungsmechanismen

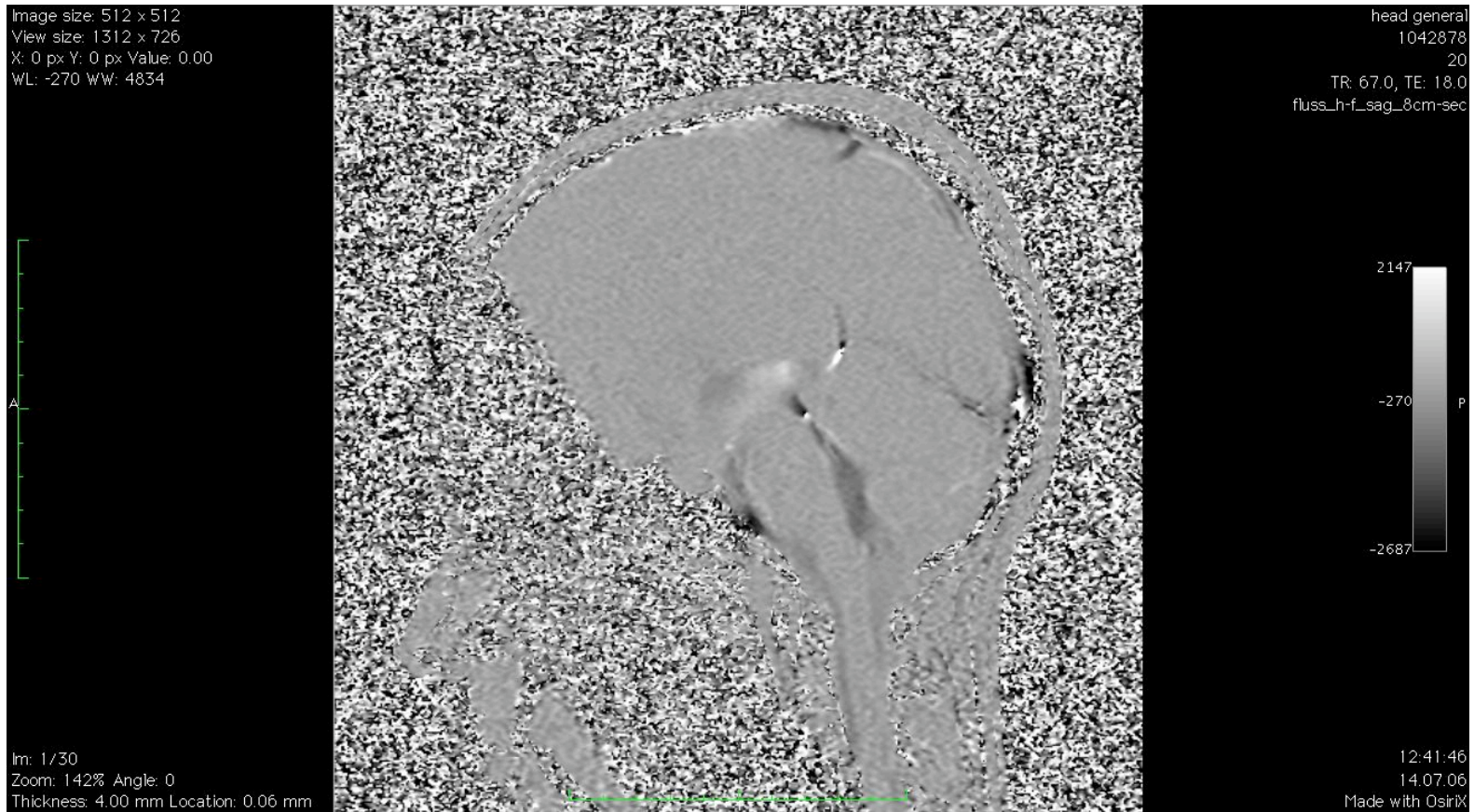
## Grundlagen



# normale Liquorpulsation



# normale Liquorpulsation

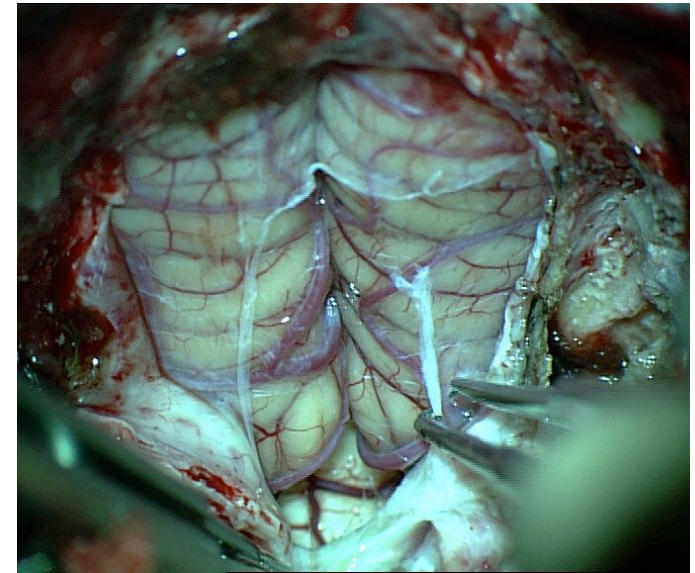




mit Syrinx  
verbundene  
Erkrankungen

**Kopf**

**Fehlbildung  
Entzündung  
Tumor  
Hydrocephalus**



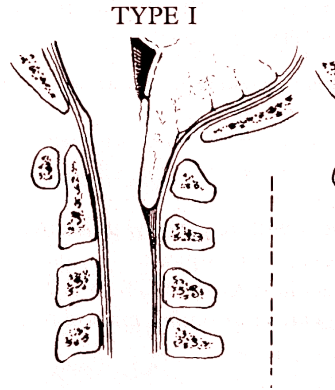
**Wirbelsäule**

**Fehlbildung  
Entzündung  
Tumor  
Degeneration  
Trauma**



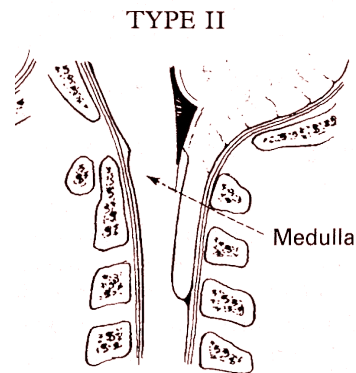
# Chiari Malformation

**Chiari I**



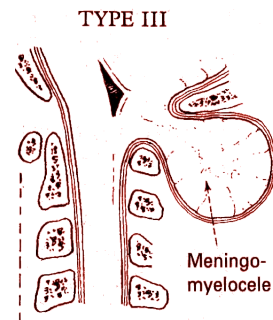
**Tiefstand > 5 mm der Tonsillen**

**Chiari II**



**Tiefstand von Kleinhirnteilen  
und 4. Ventrikel**

**Chiari III**



**offenes Kleinhirn**

**Chiari IV**

**Kleinhirnminderanlage**



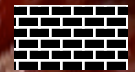
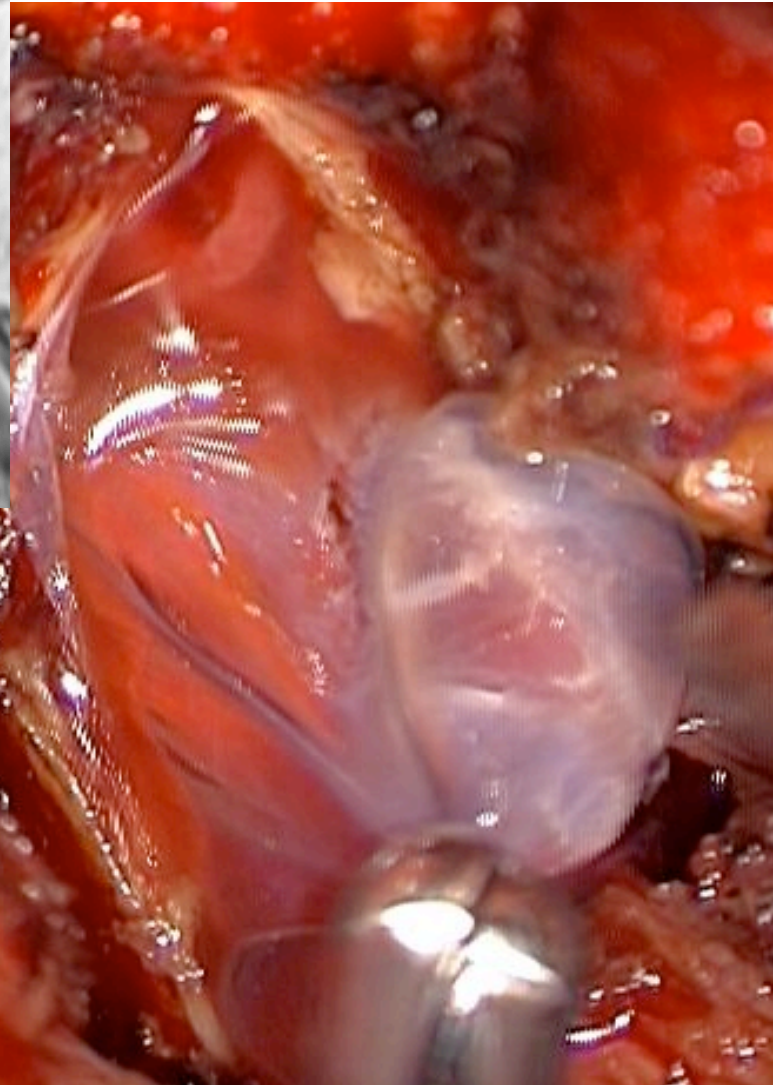
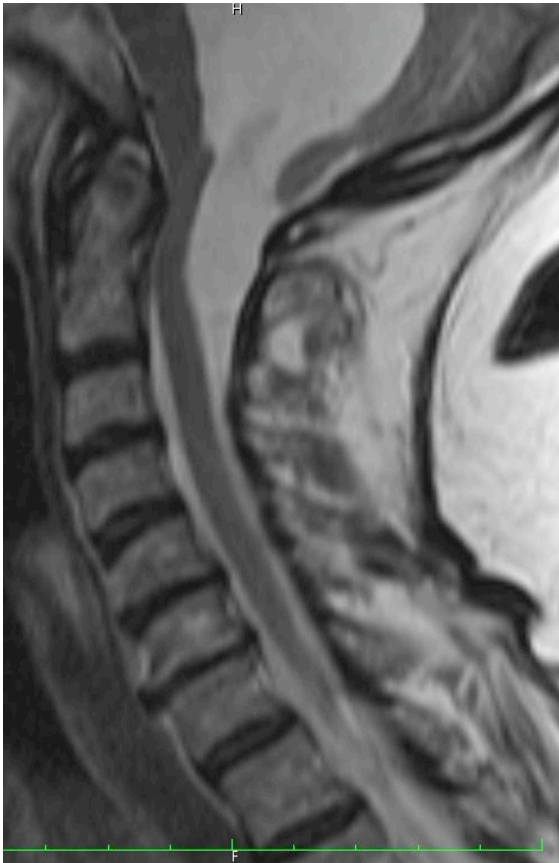
# Chiari Malformation Typ 0

Verschluss IV. Ventrikel  
Zu kleine HSG  
Kein Tonsillientiefstand

nach Iskandar, päd. NS AANS, Dec. 1997



# Chiari Malformation Typ 0 (?)

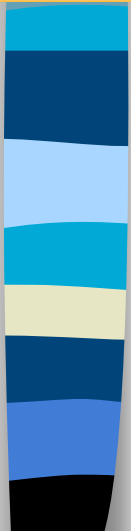




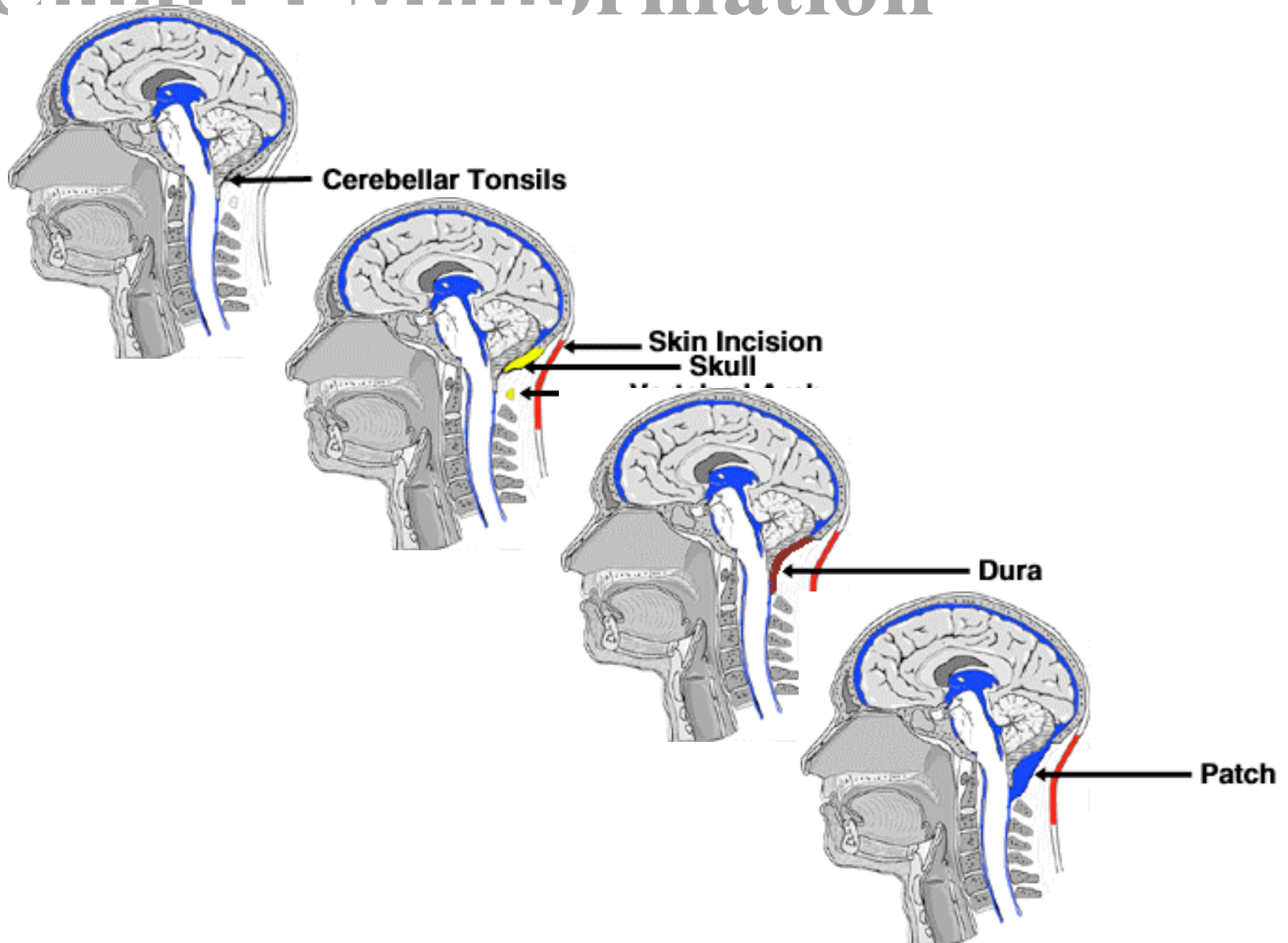
# Chiari I - Malformation



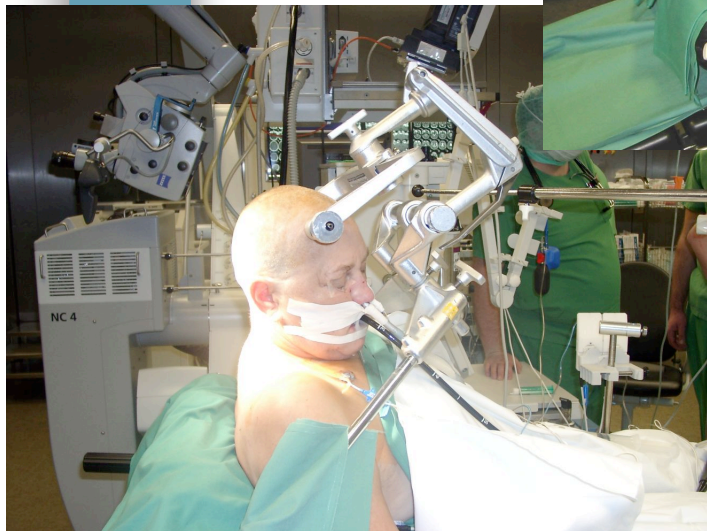
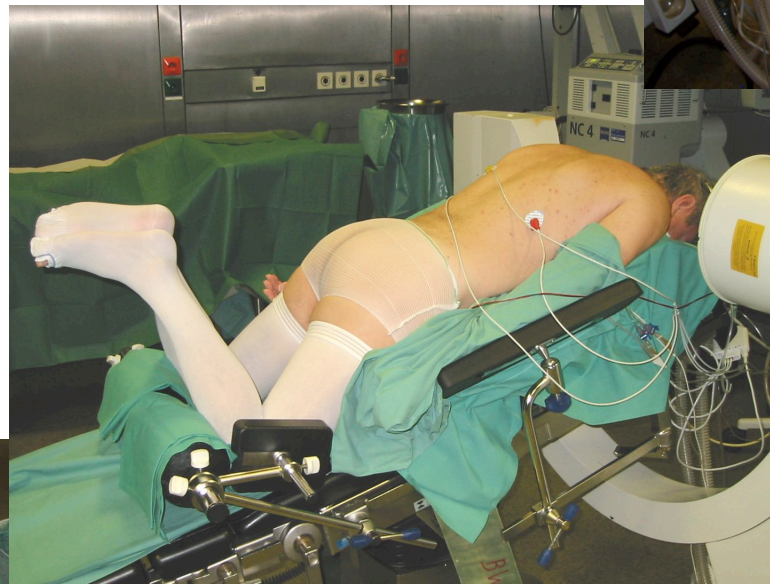
# Chiari I - Malformation



# Chiari I Malformation

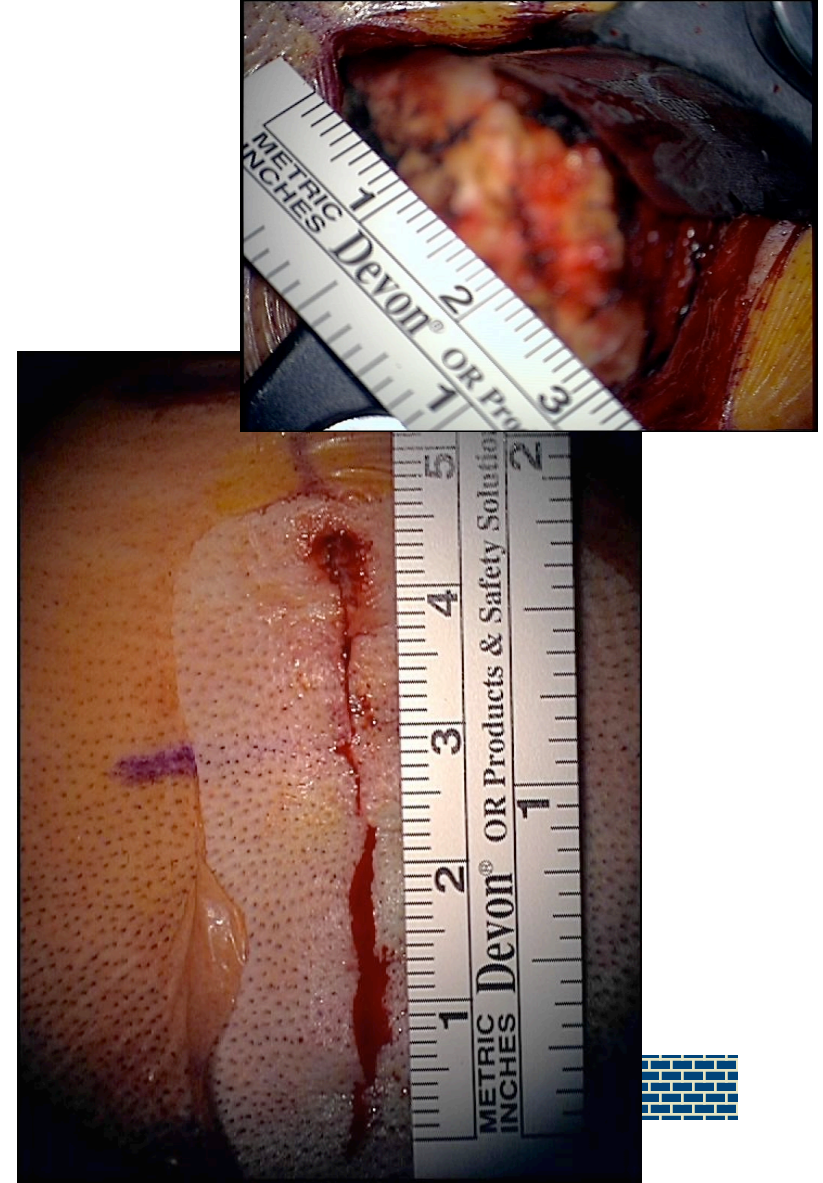


# Lagerung bei der Operation

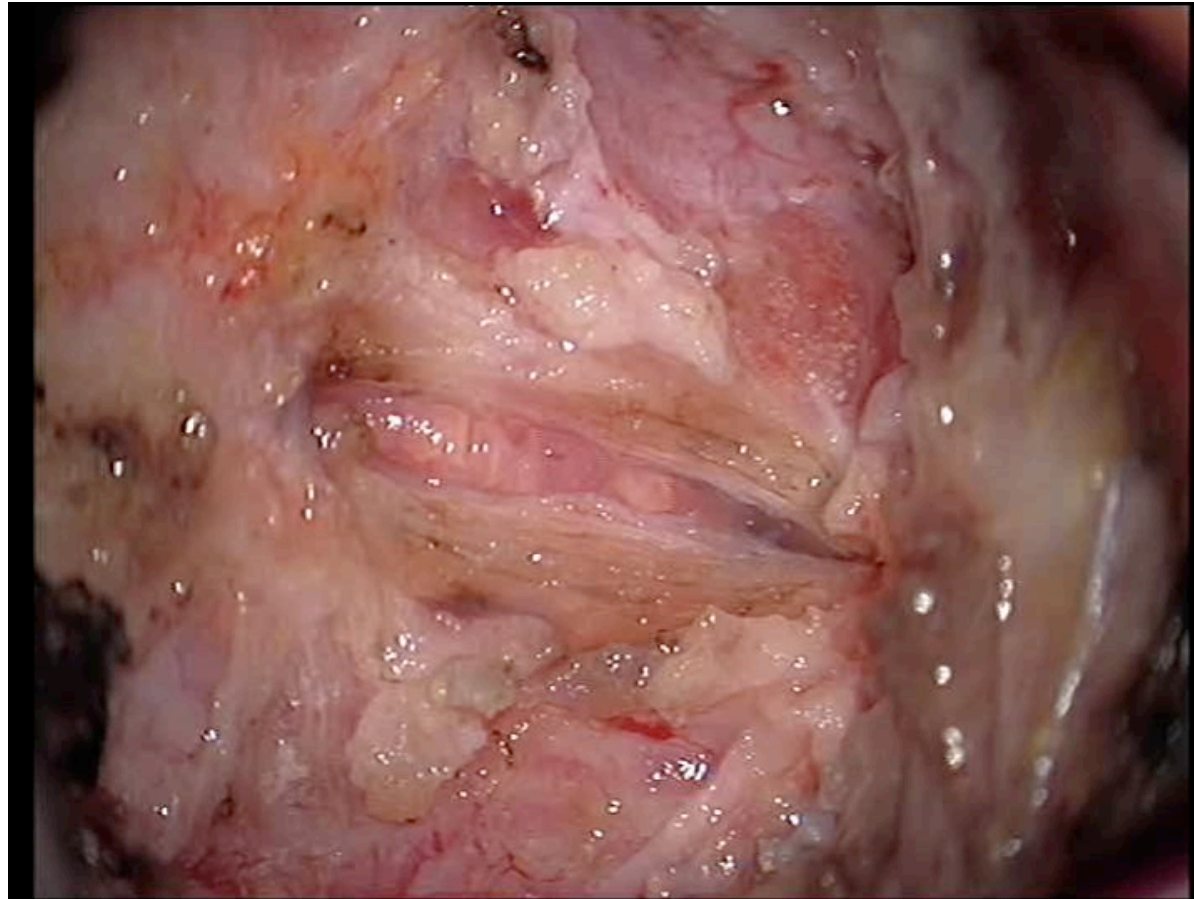




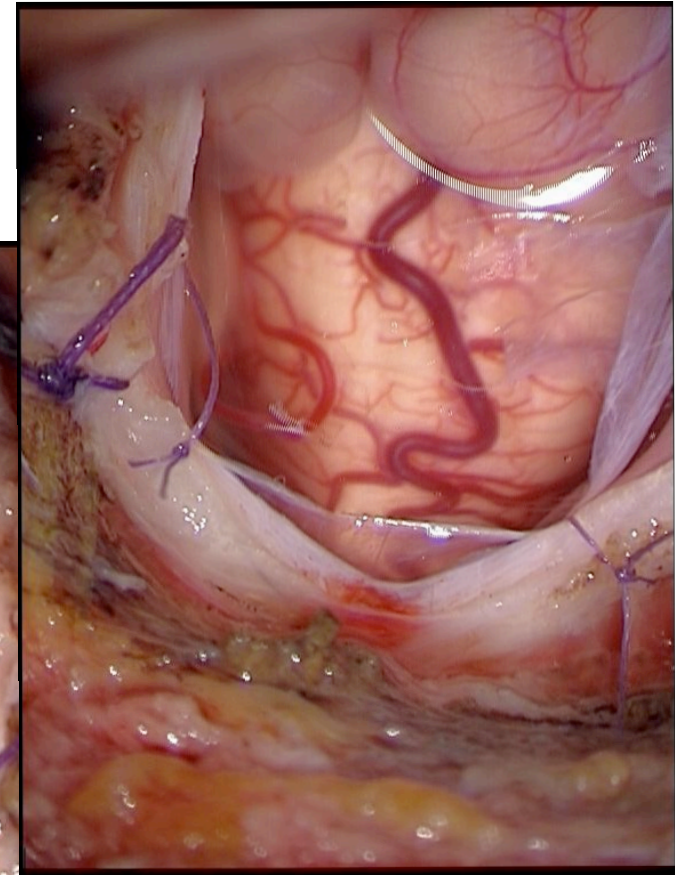
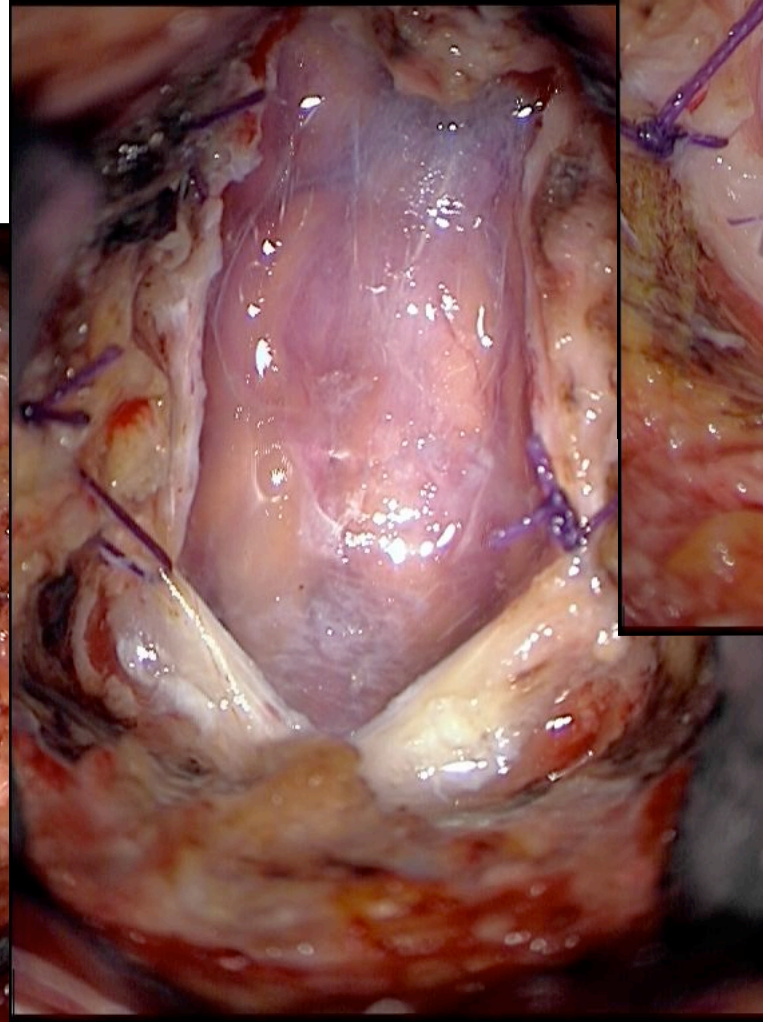
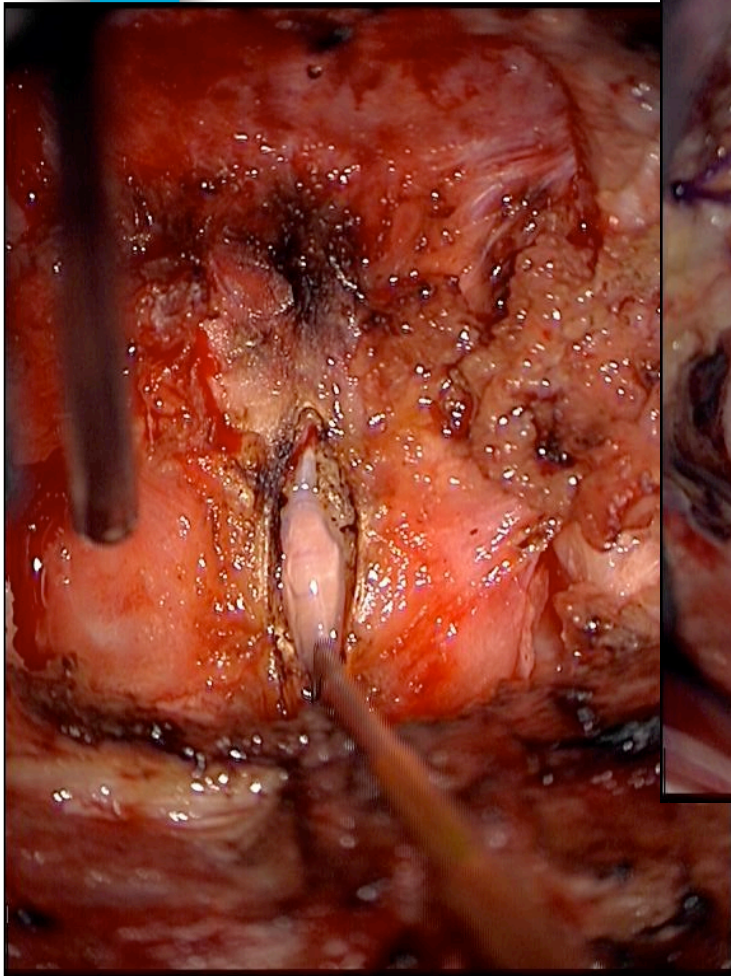
# Sparsamer Hautschnitt

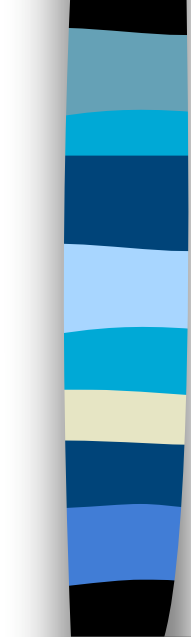
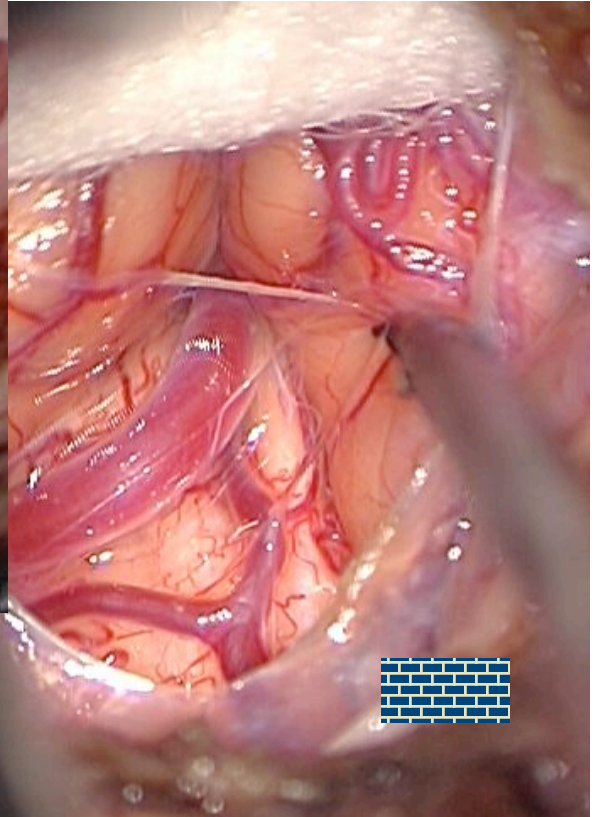
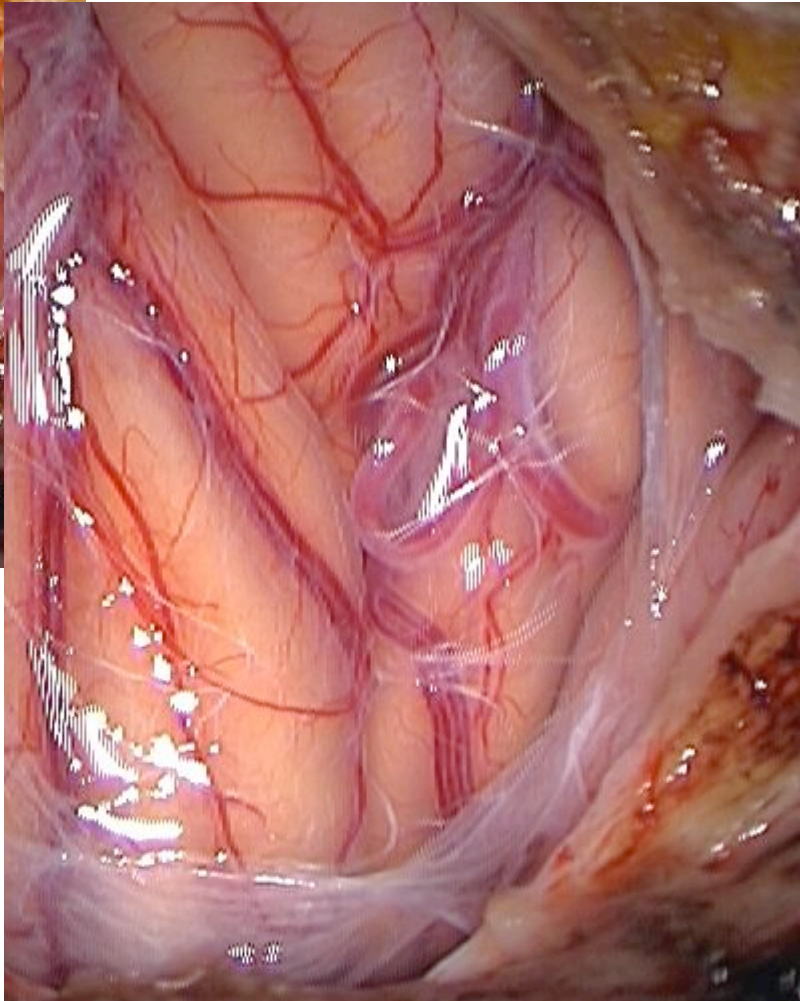
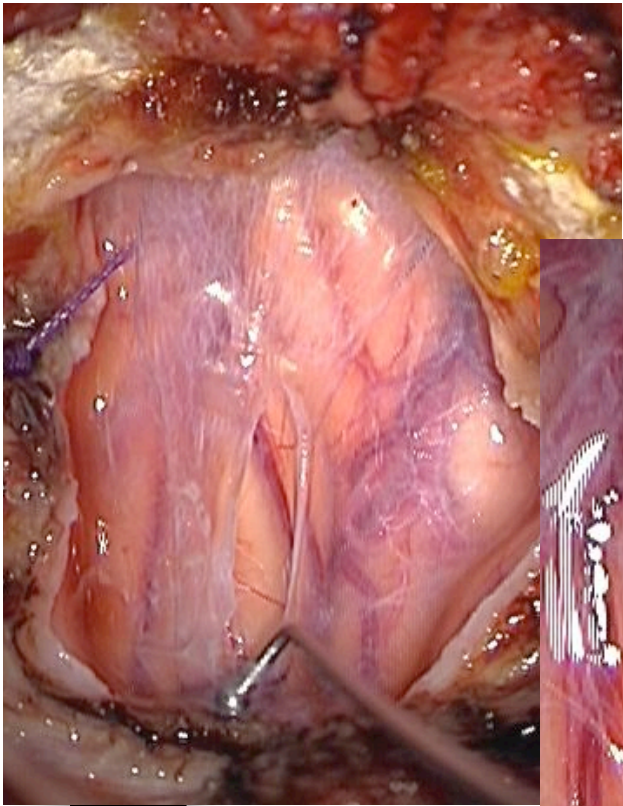


# Pulsationen

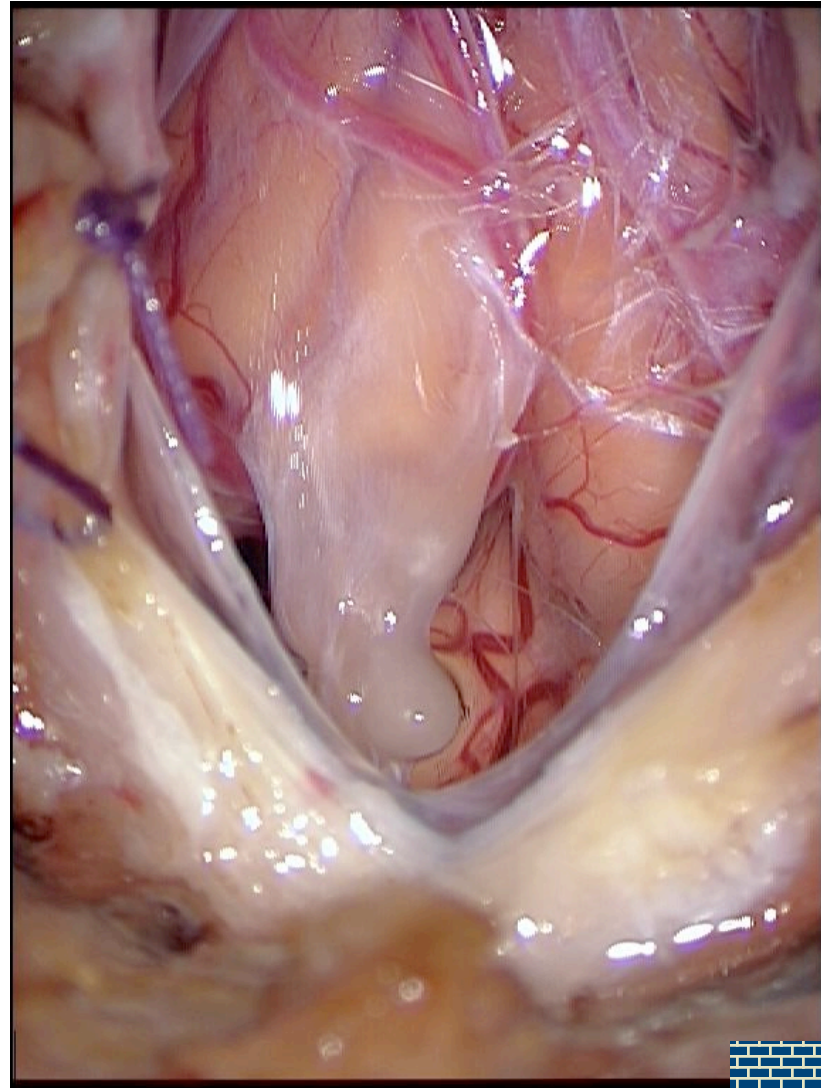
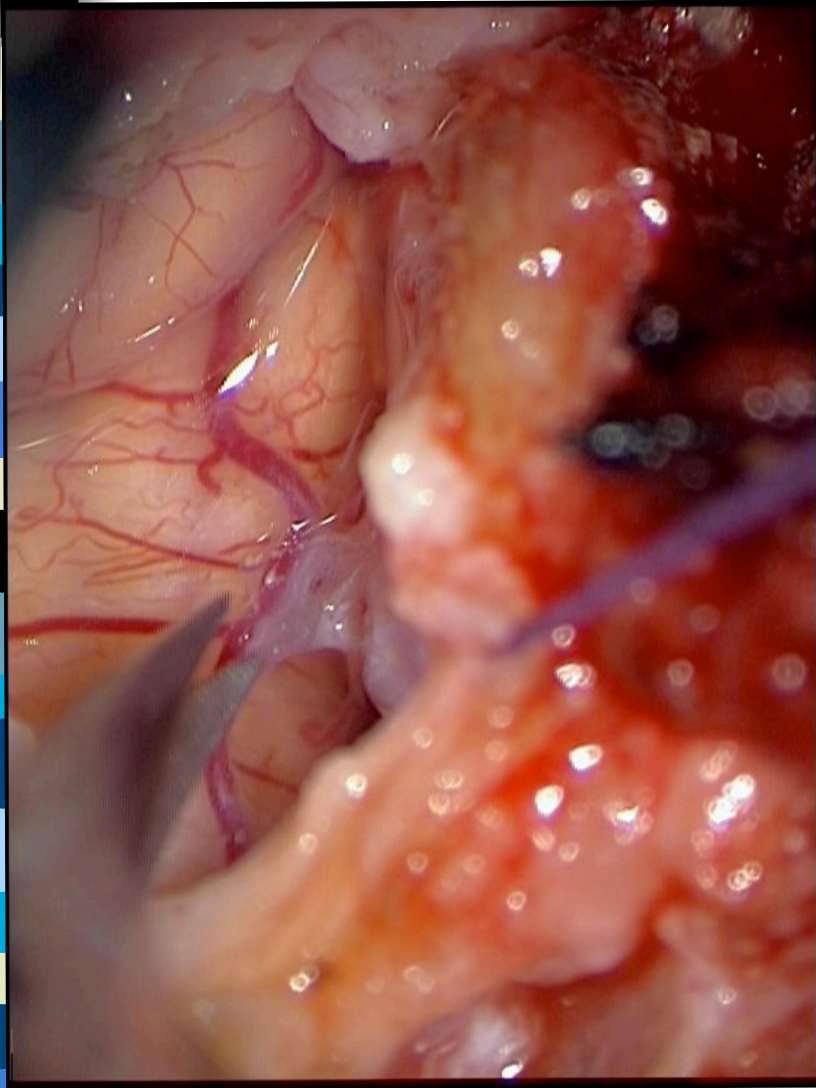


# Duraeröffnung

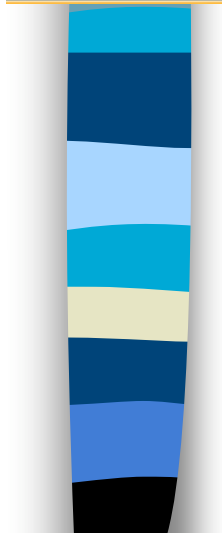
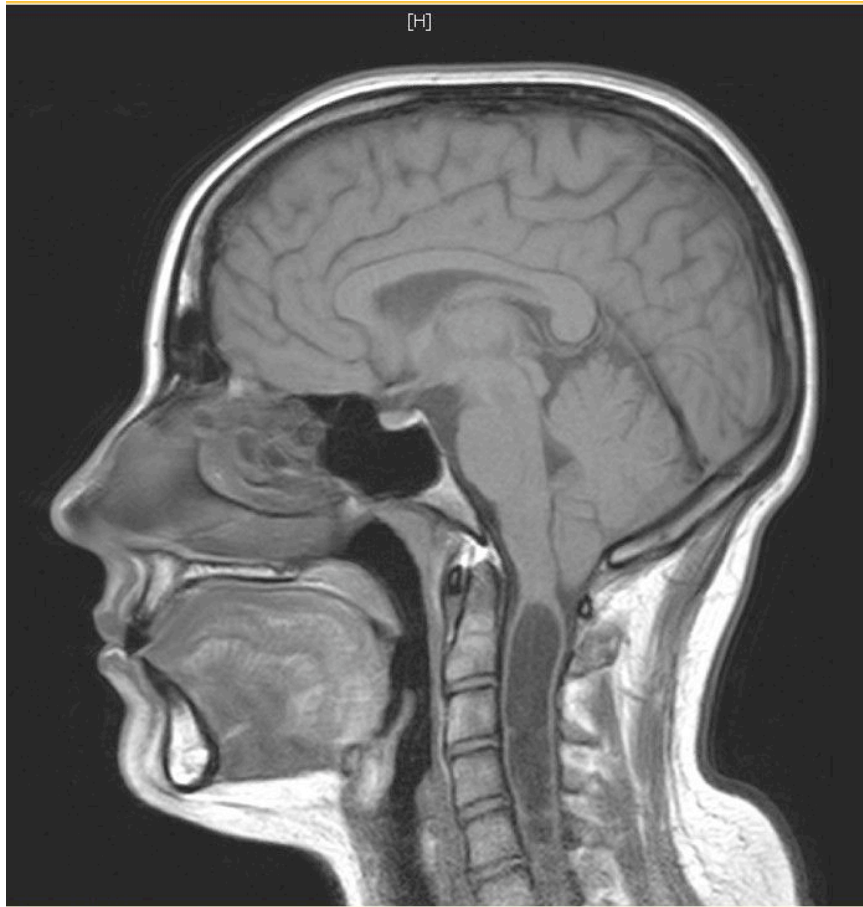




# Chiari I Malformation



# Chiari I - Malformation

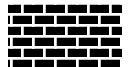


# Chiari I Malformation

## OP-Indikation - Umfrage Weltweit

- Asymptomatische Chiari I, ohne Syringomyelie
- Kein einziger OP-Indikation
  
- Chiari I, mit Syringomyelie, mit Skoliose
- Jeder OP-Indikation

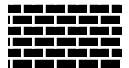
Nach Schijman E, Steinbok P (2004) International survey on the management of Chiari I malformation and syringomyelia. Childs Nerv Syst 20:341 - 348



# Chiari I Malformationen

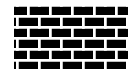
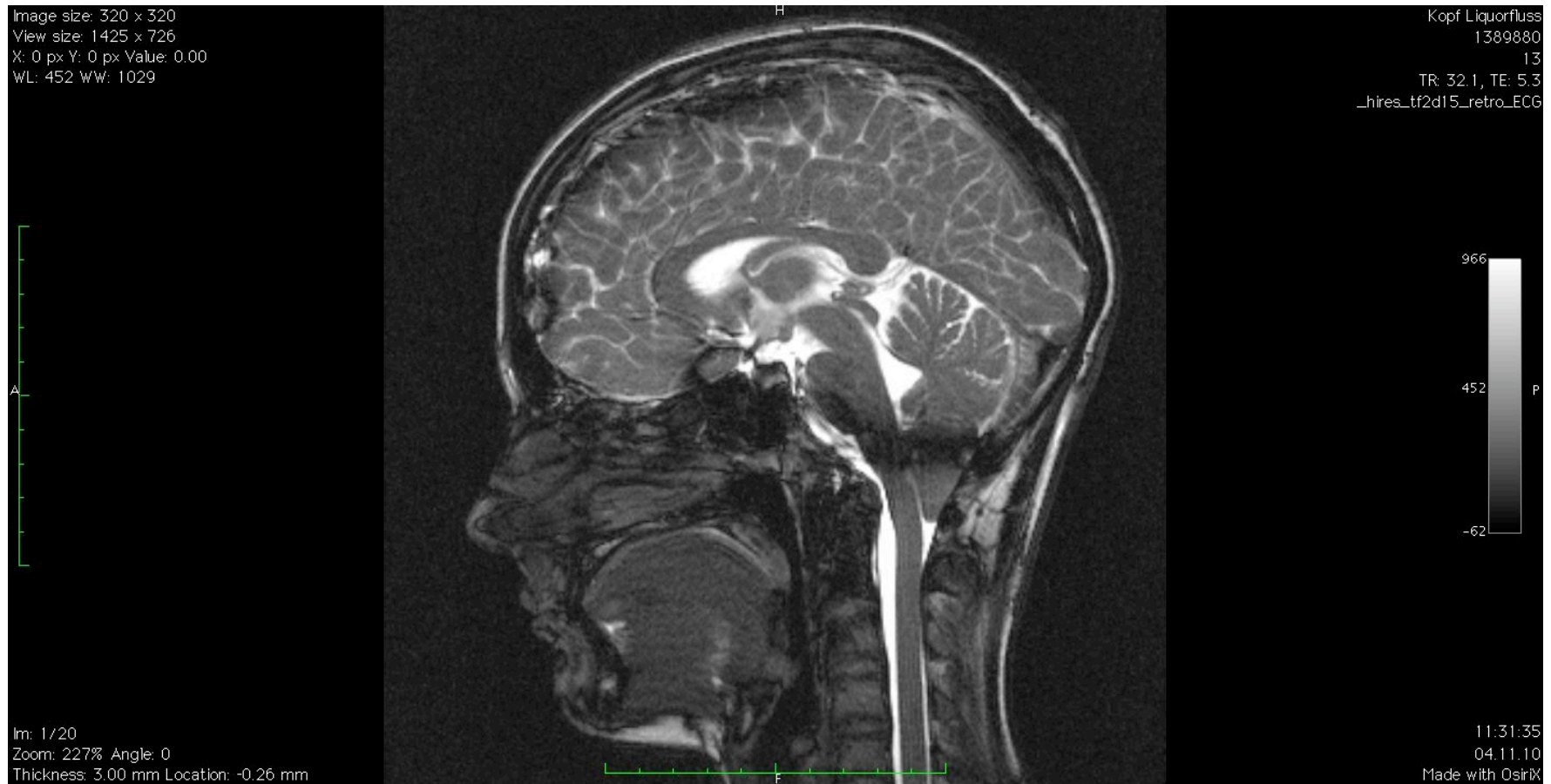
- kleine hintere Schädelgrube
- erhöhter intrakranieller Druck
- erniedrigter intraspinaler Druck
- Tethered-Cord-Syndrom
- (Hypermobilität kraniozervikal)

nach Milhorat et al, Br J Neurosurg 2007





# Chiari I Malformation



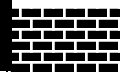
Beispiel:  
Shuntfehlfunktion  
20 Jahr,  
männl.



vor Shuntrevision



nach  
Shuntrevision





# Syringomyelie

## Ursache im Wirbelkanal

Entzündung

Blutung

Degenerative Veränderung

Tumor

Tethered cord

Verletzung





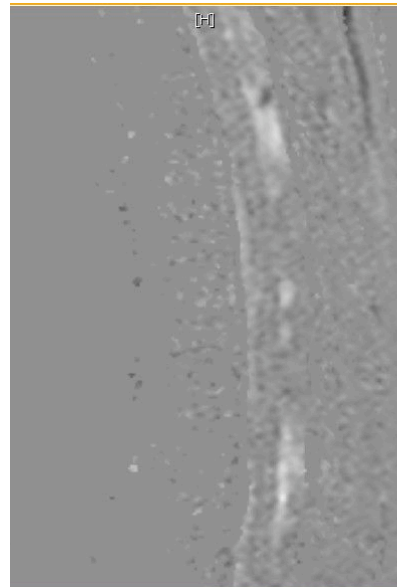
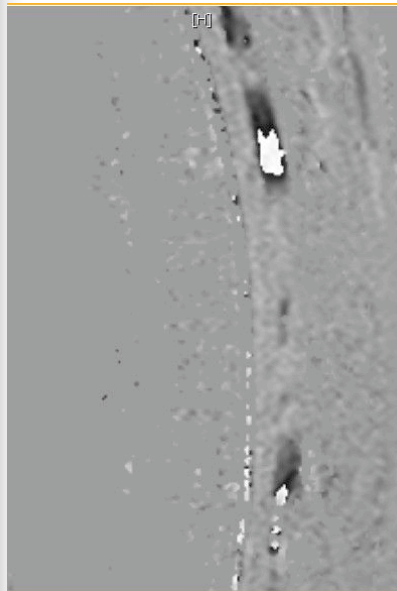
# Syringomyelie nach Verletzungen

Verletzung der Arachnoidea  
auch ohne Rückenmarksverletzung  
auch nach Jahren nach der Verletzung  
nicht nur in der Höhe der Verletzung

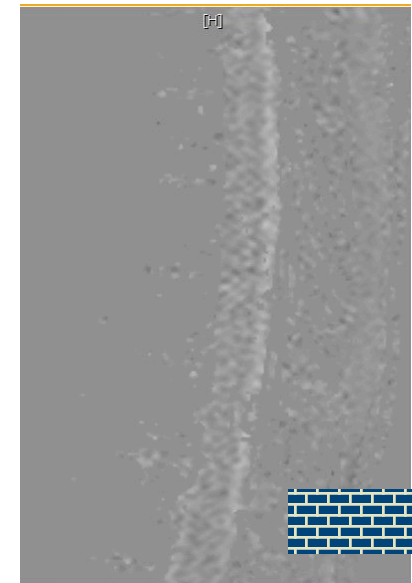
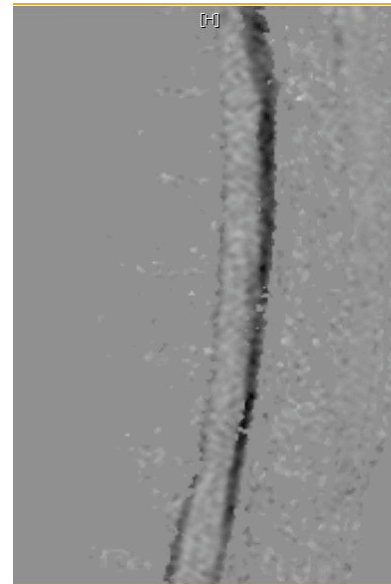


# Liquorpulsationsdarstellung

**vor der Operation**



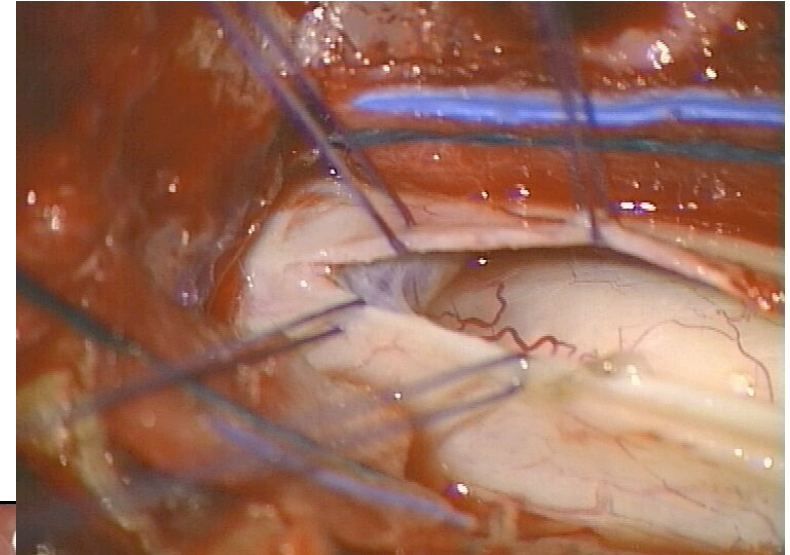
**- nach der Operation**



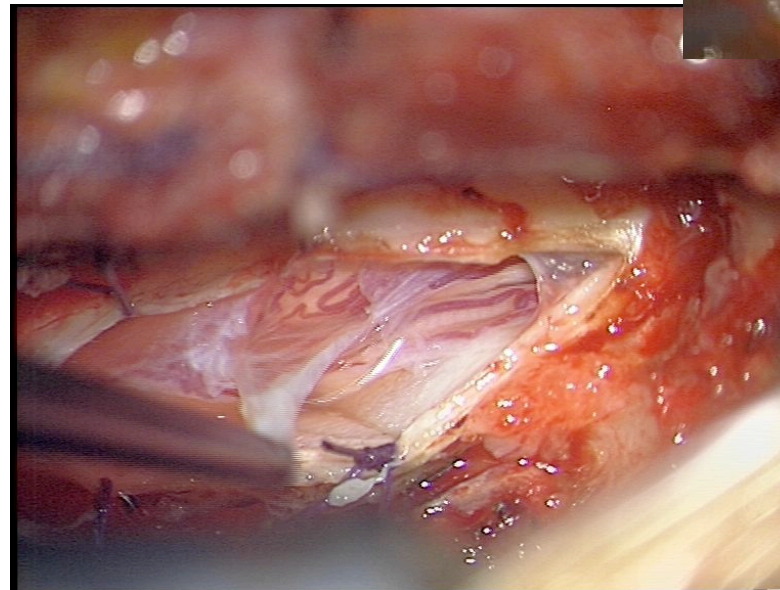
# Spinale Ursache Syringomyelie

## Subarachnoidale Adhäsion

- Zyste

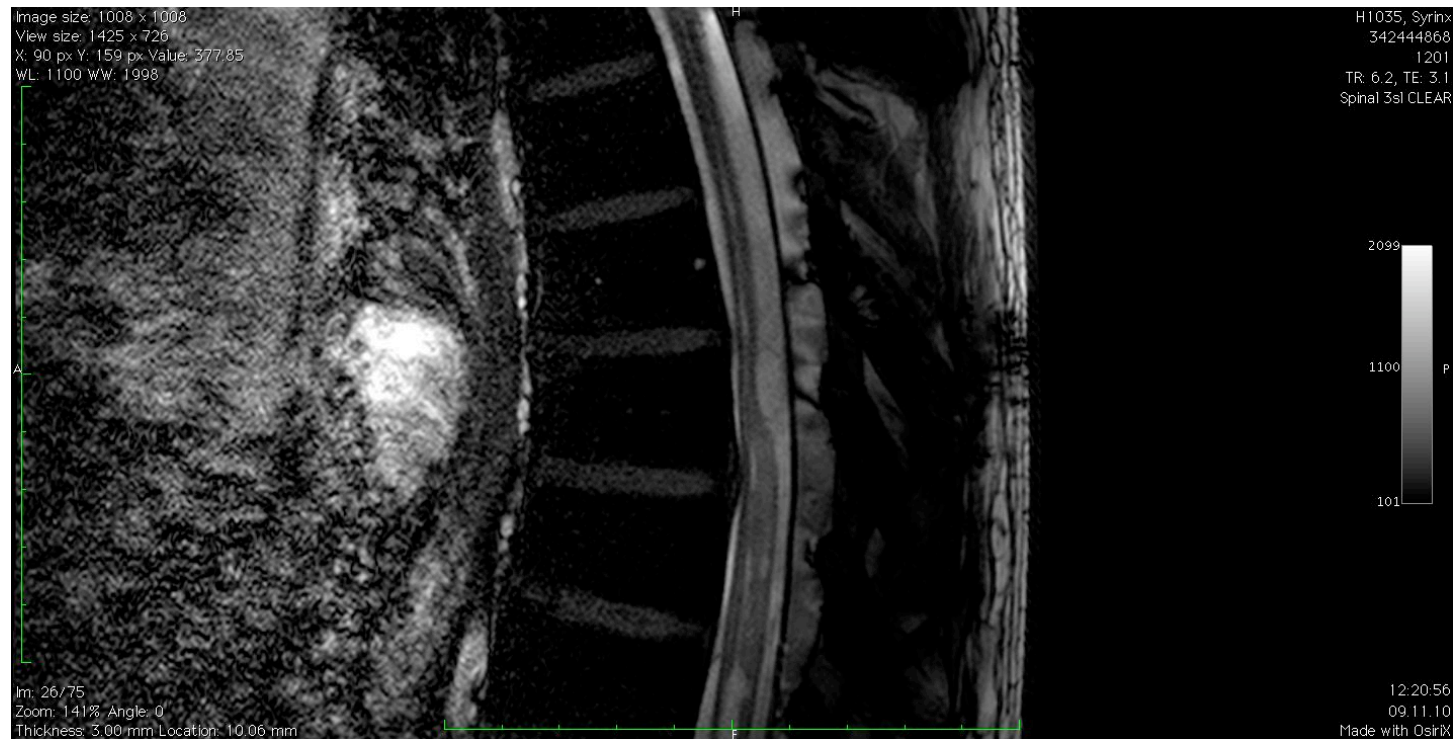


- Netz



# Spinale Ursache Syringomyelie

## Subarachnoidale Adhäsion





# Operation bei Syringomyelie

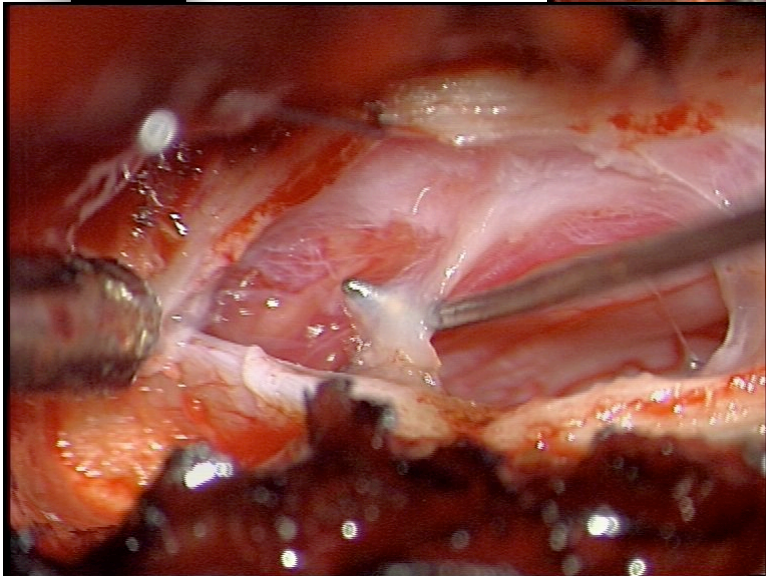
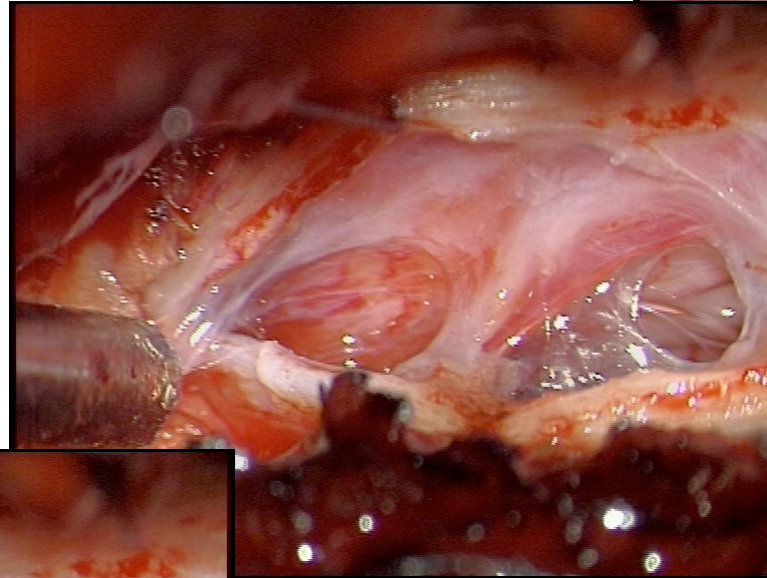
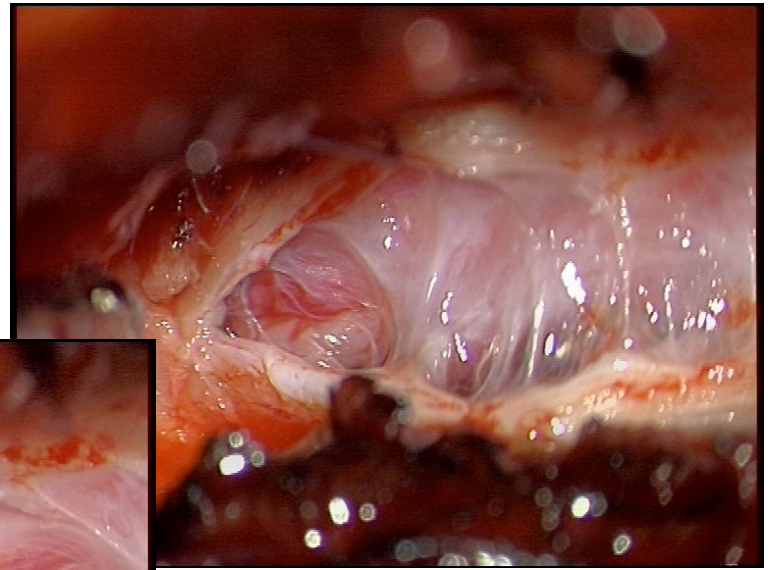
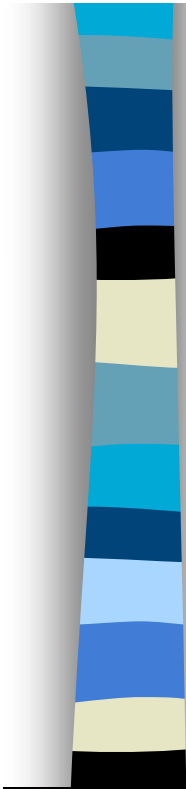
Entlastung des Wirbelkanals

Lösen von Verwachsungen

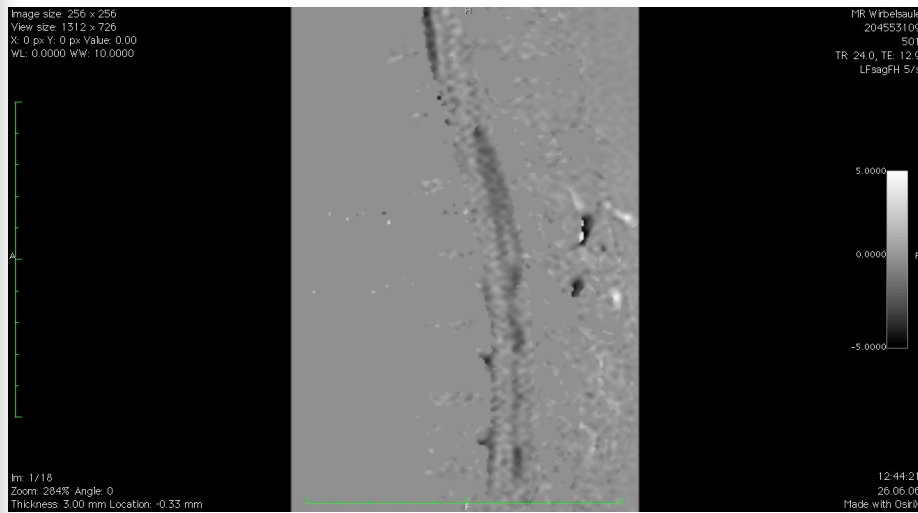
Vermeiden neuer Verwachsungen



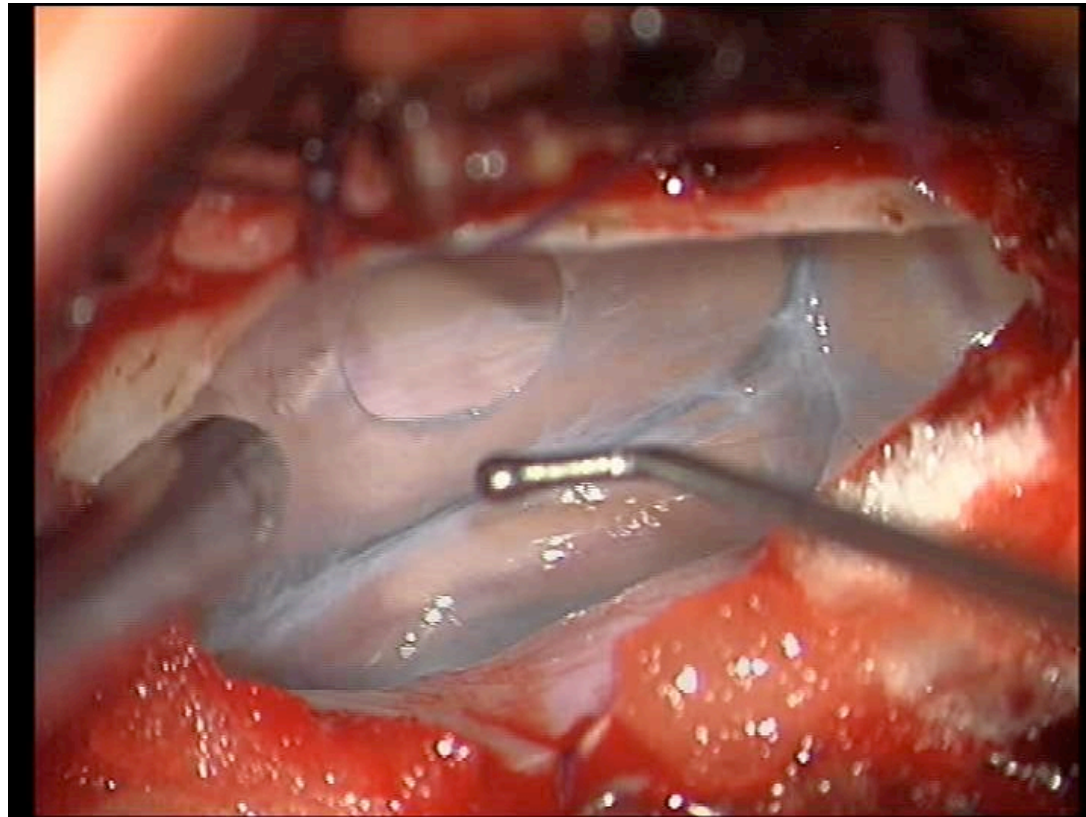




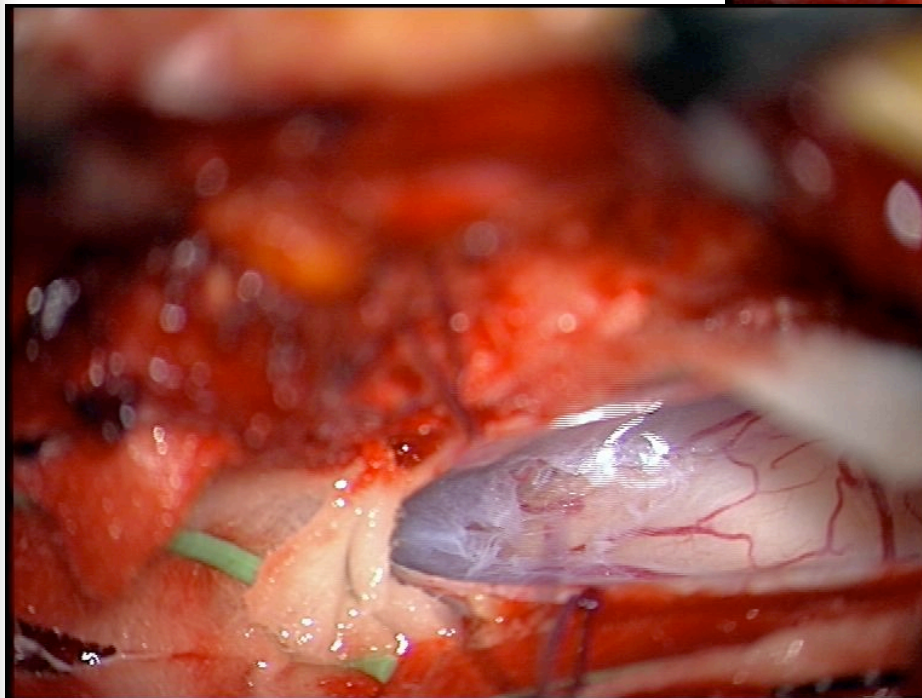
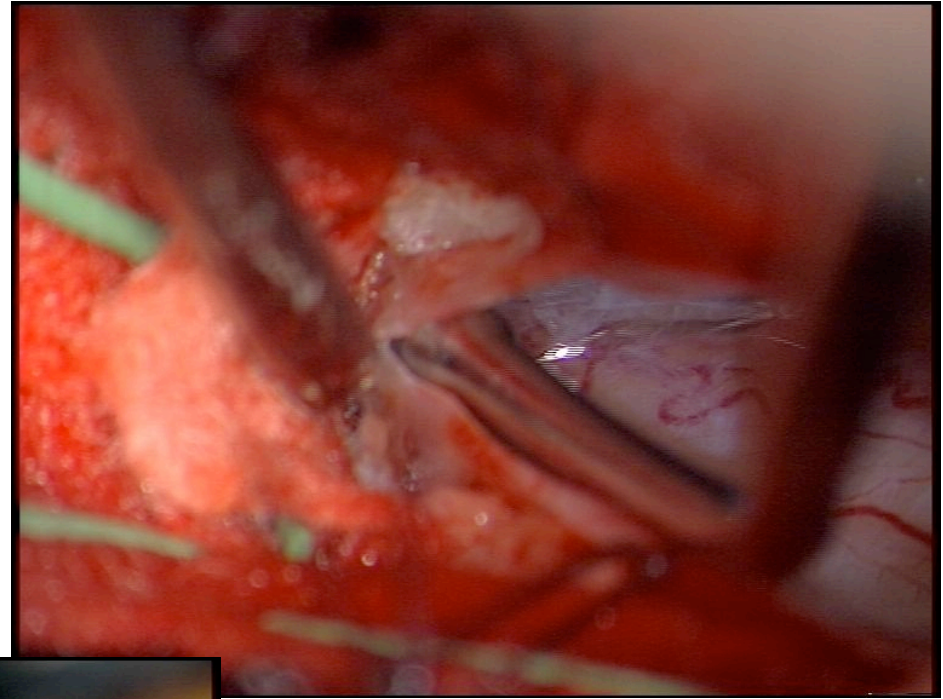
# Arachnoidale Verwachsungen distal der Syringomyelie



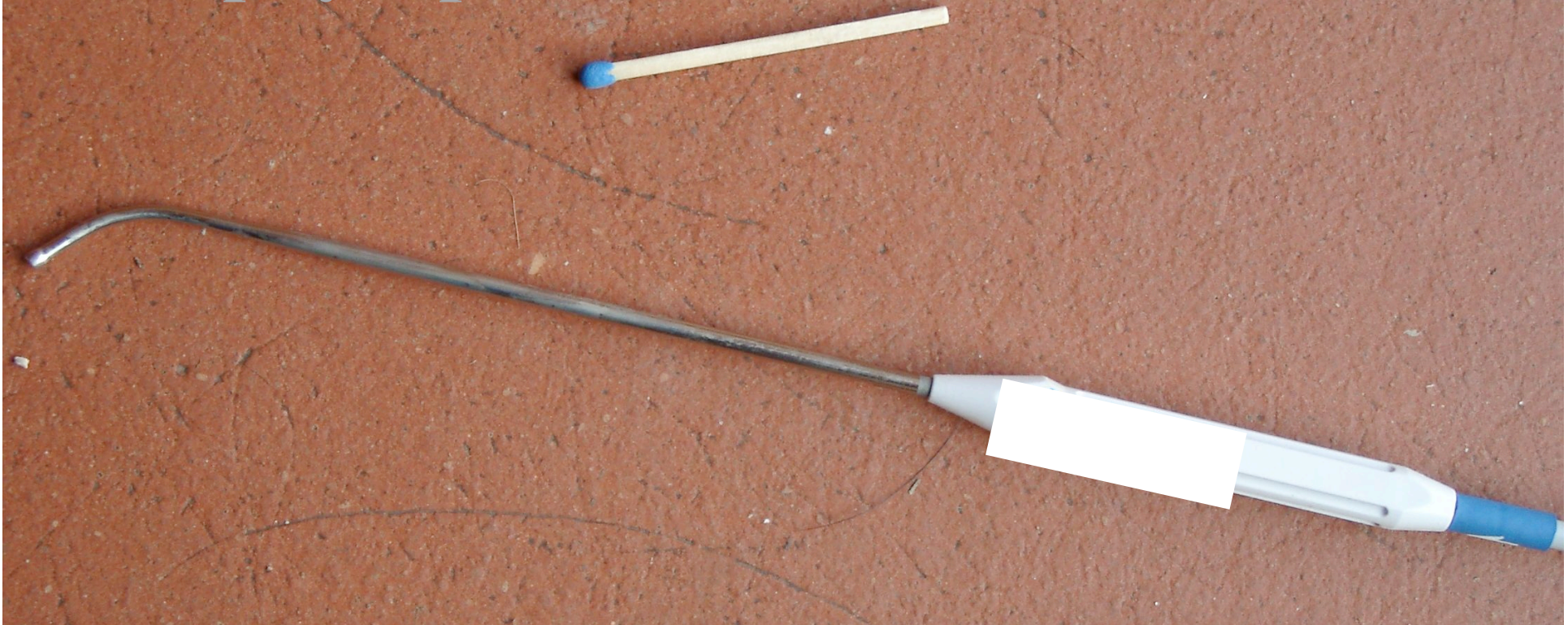
# Typischer intraoperativer Befund



# Endoskopie



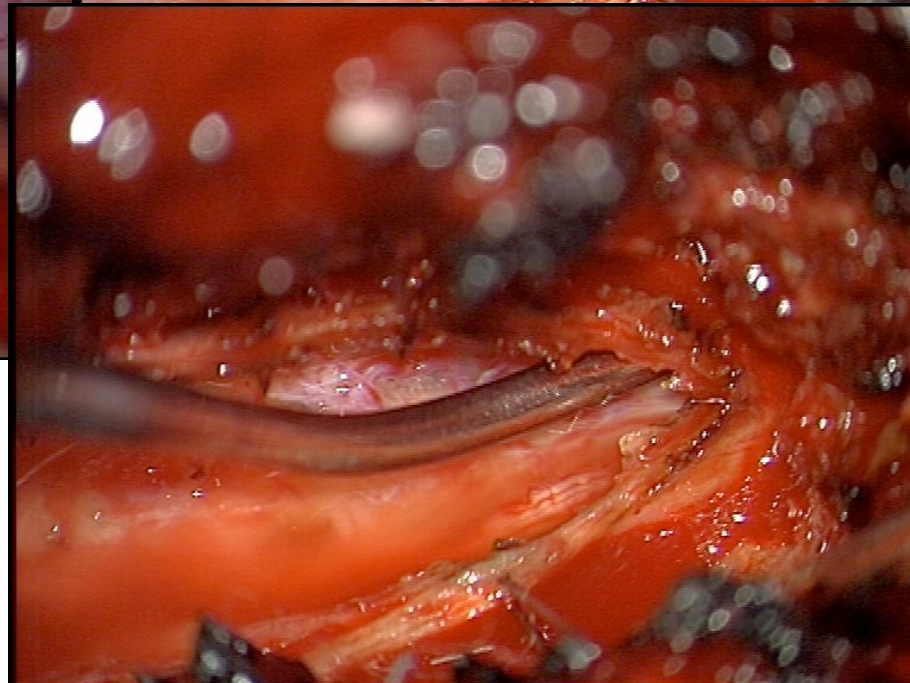
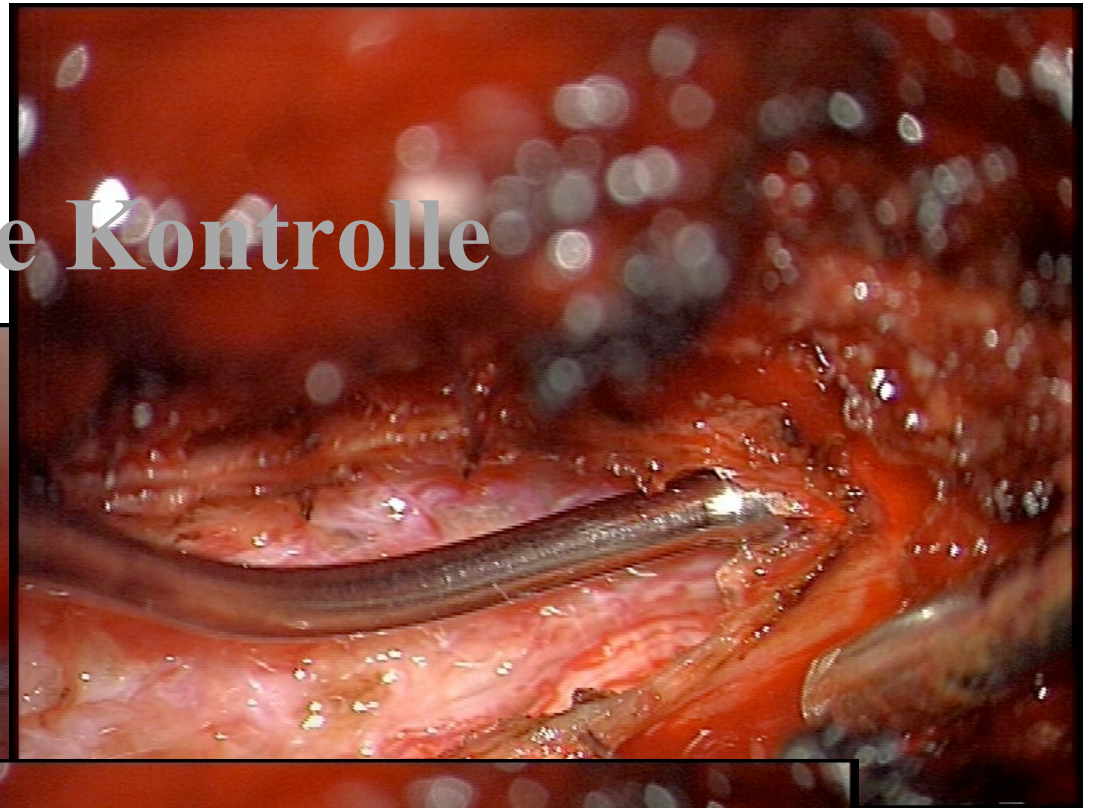
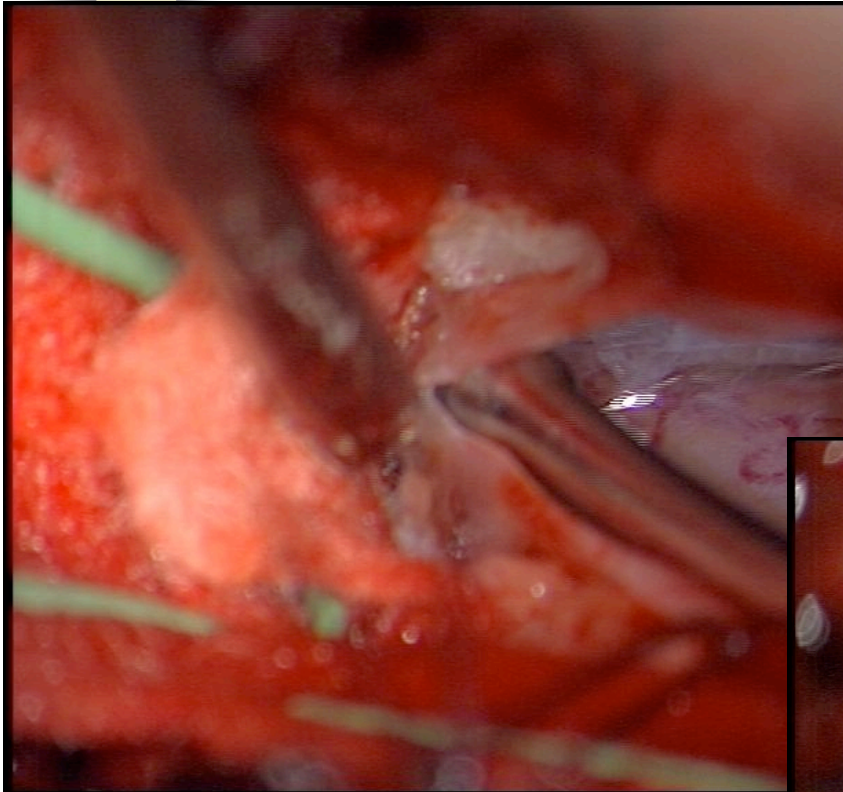
Murphycope®



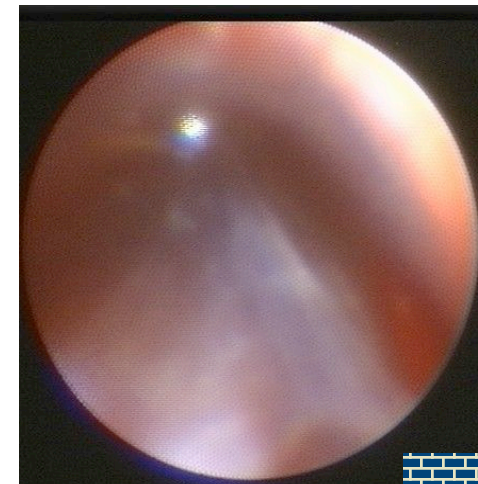
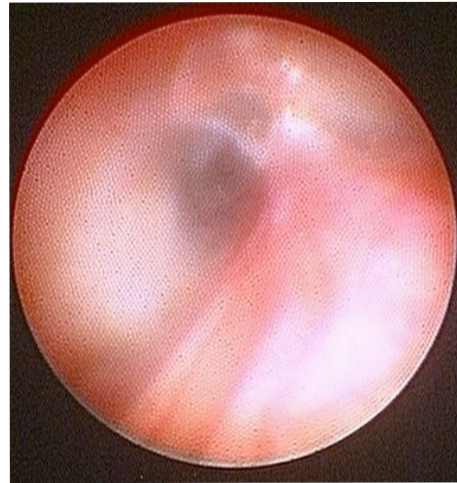
**Durchmesser 1,4 und 2,3 mm**  
**10.000 Pixel**  
**frei biegsam, Spülkanal**



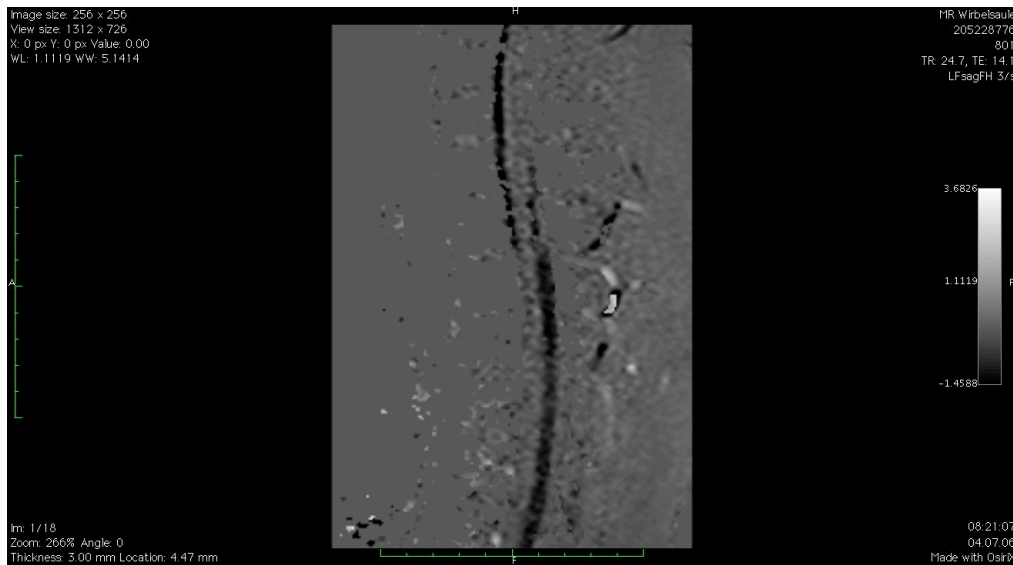
# Endoskopische Kontrolle



# Endoskopische Kontrolle



# Arachnoidale Verwachsungen distal der Syringomyelie postoperativ





# Posttraumatisches Tethering

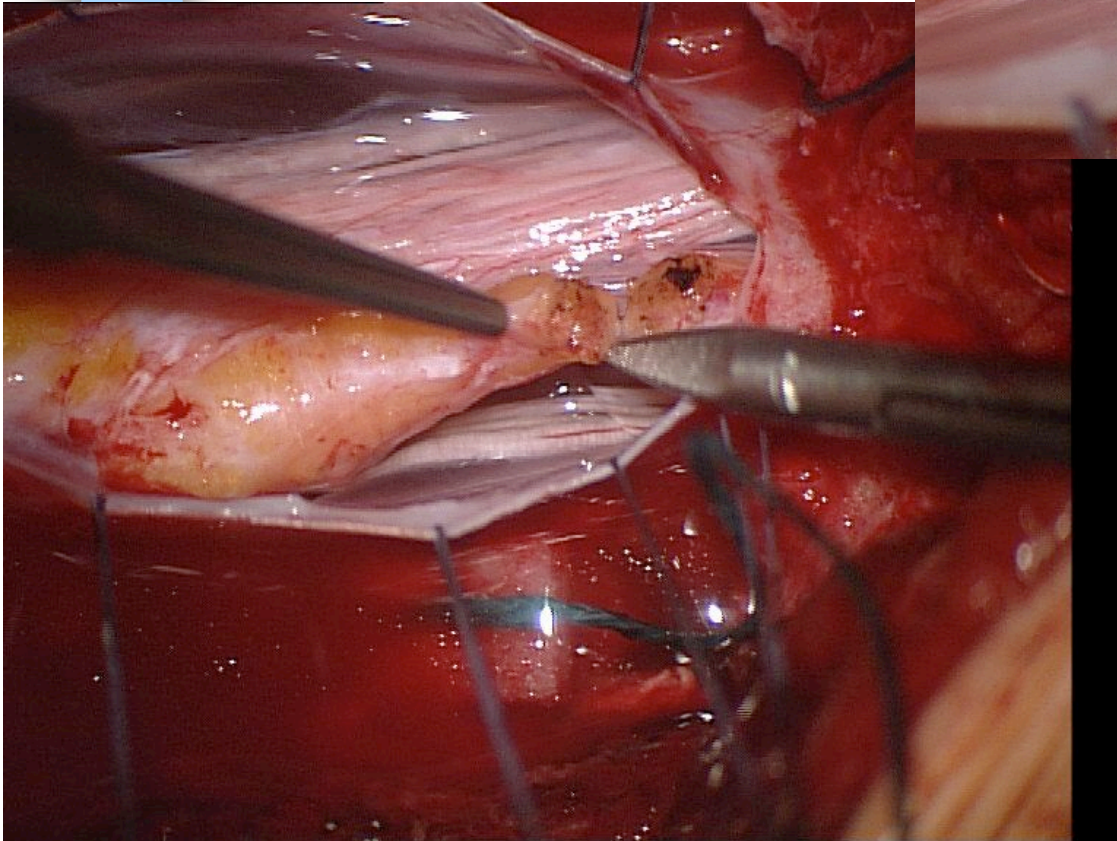
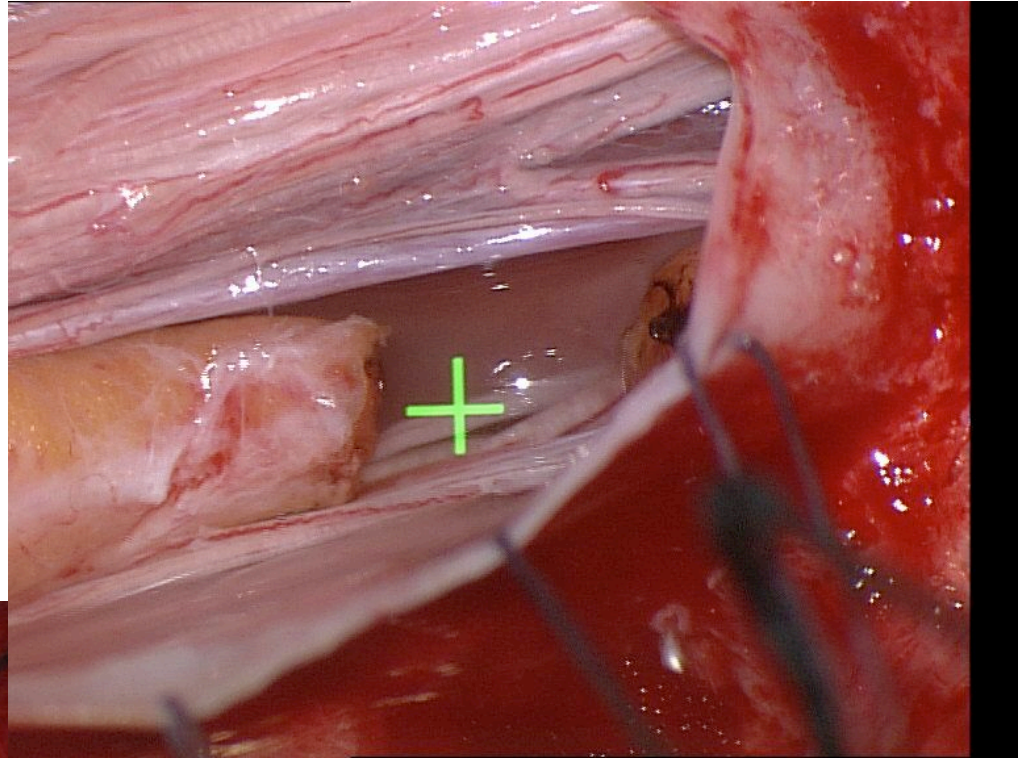


# Tethered Cord





# Tethered Cord





# International Conference on Syringomyelia

December 09 - 11, 2010

Berlin, Germany

[www.syringomyelia2010.org](http://www.syringomyelia2010.org)

