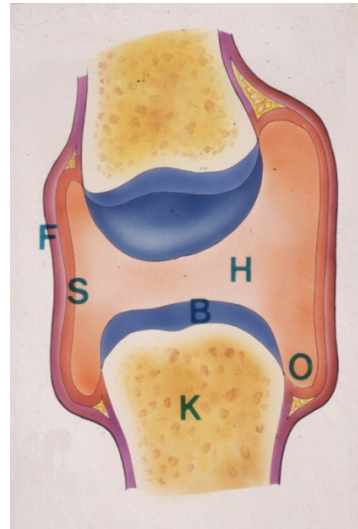


# LED



ANATOMI

Henrik Løvschall

Anatomisk afsnit, TA

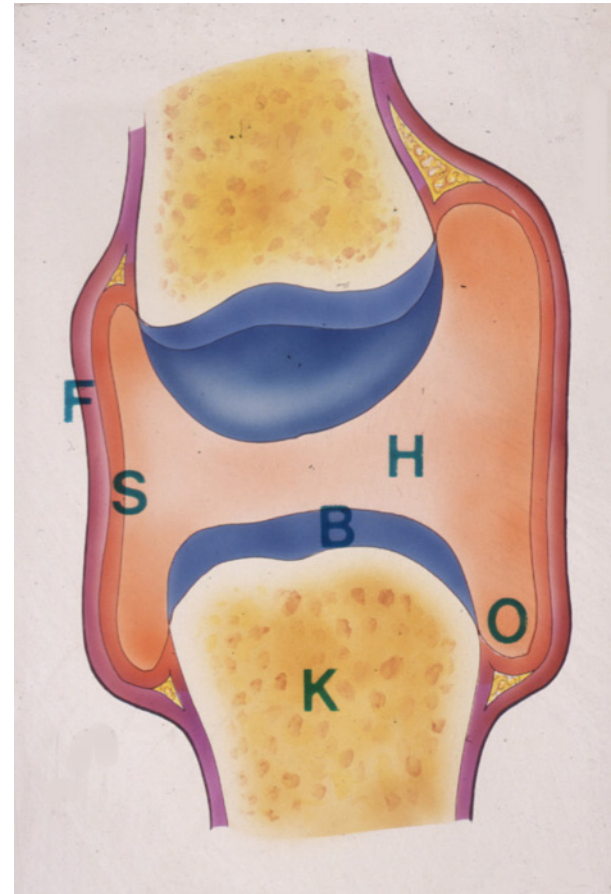
Århus Tandlægeskole

# LED

- UÆGTE
- ÆGTE

# ÆGTE LED

- ledhule
- ledflader



# UÆGTE LED

- ingen ledhule
- lille bevægelighed

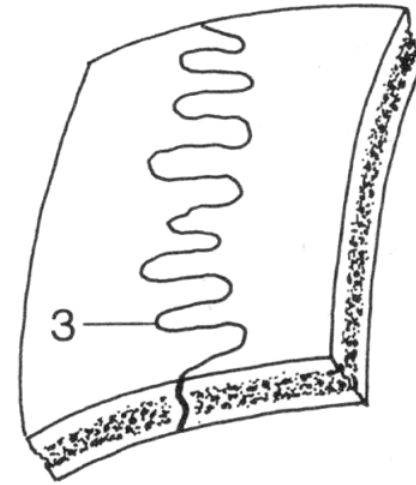


FIG. 2

# UÆGTE LED

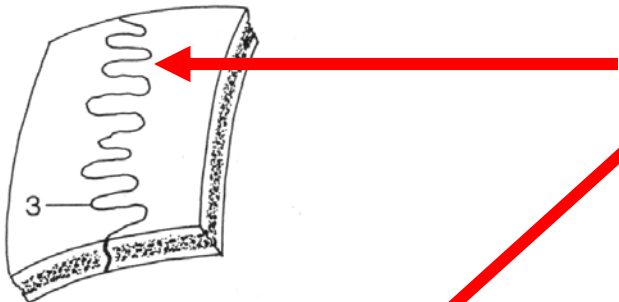
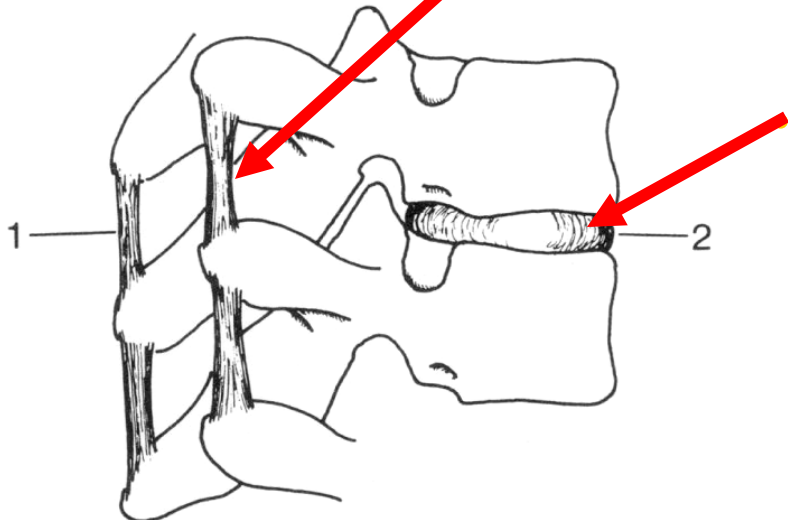


FIG. 2



- SYNDESMOSER

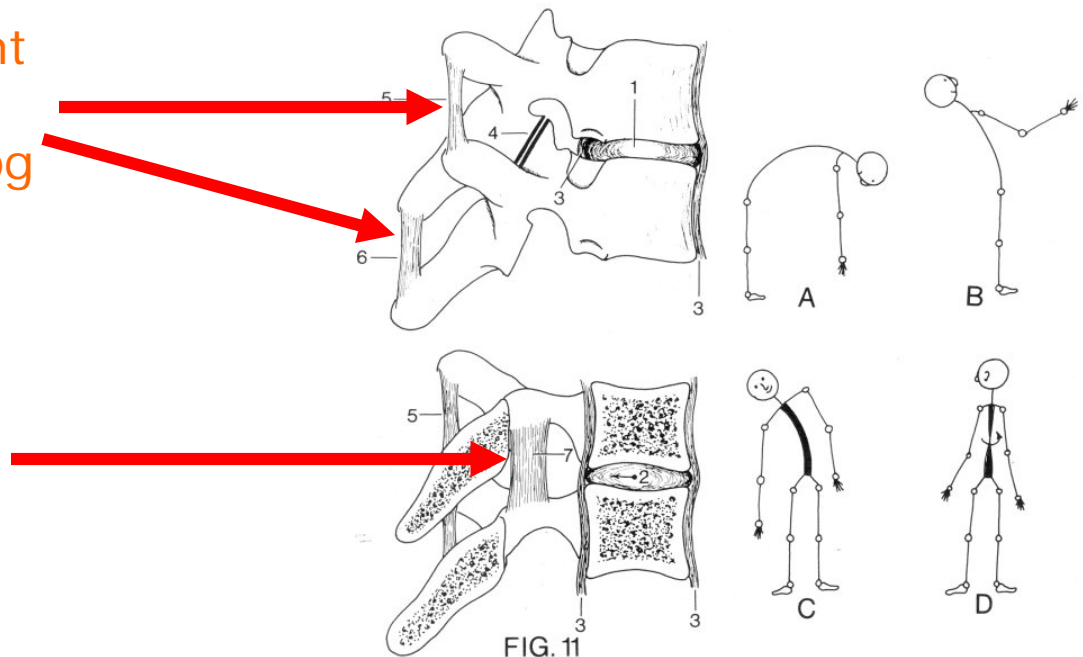
- knogler holdes sammen af bindevæv

## SYNCHONDROSER

- knogler holdes sammen af brusk

# UÆGTE LED

- SYNDESMOSER (membraner eller ledbånd)
  - Fibrøse
    - fibrillært, kollagent bindevæv
    - fx mellem tvær- og torntappe
  - Elastiske
    - elastisk bindevæv
    - fx på hvirvelbuer



# UÆGTE LED

- eksempel på savtakkeformede fibrøse syndesmoser
- *sutura serratae*

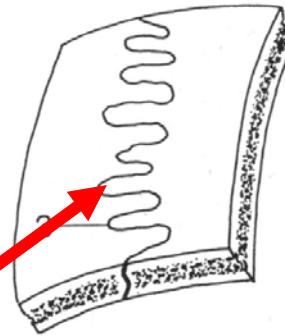


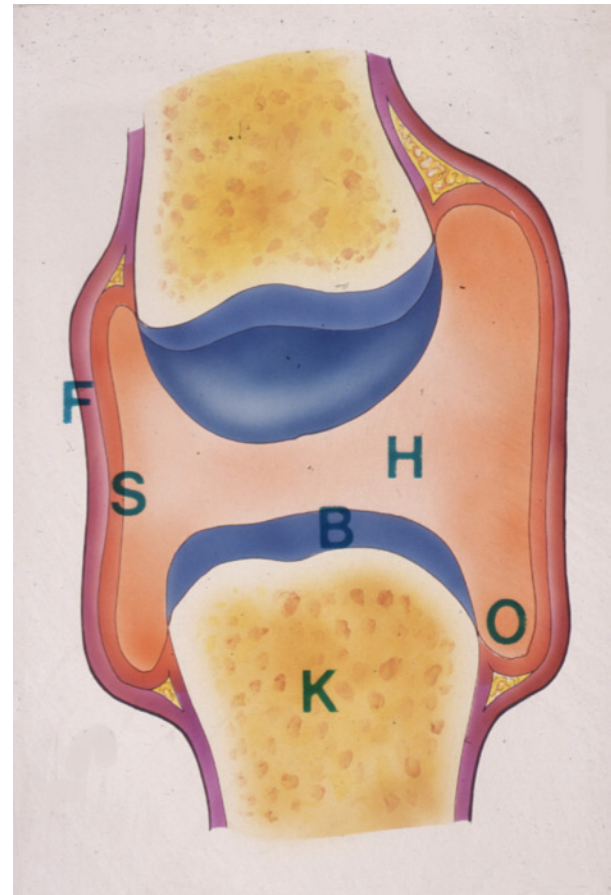
FIG. 2

# ÆGTE LED

De ægte led har:

- LEDBRUSK
- LEDKAPSEL
- OMSLAGSFOLD
- LEDHULE

B  
FS





# ÆGTE LED

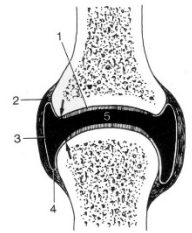
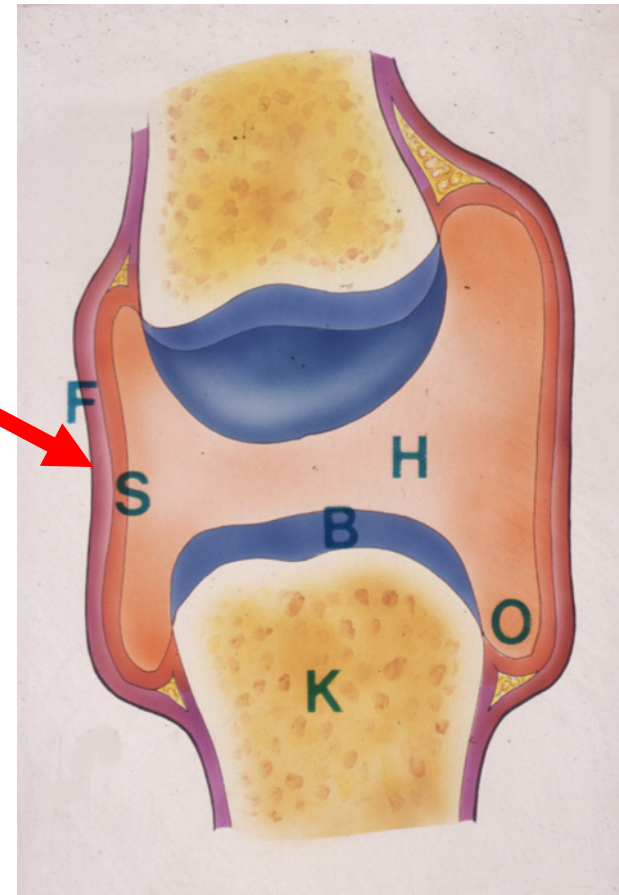


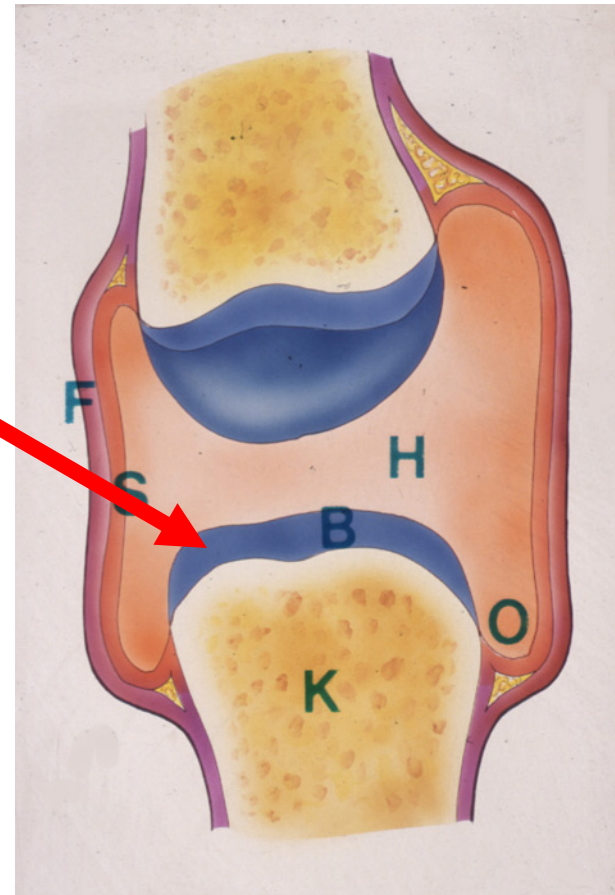
FIG. 4

- LEDHULE
  - spalte med ledvæske
  - begrænses af bindevævskapsel



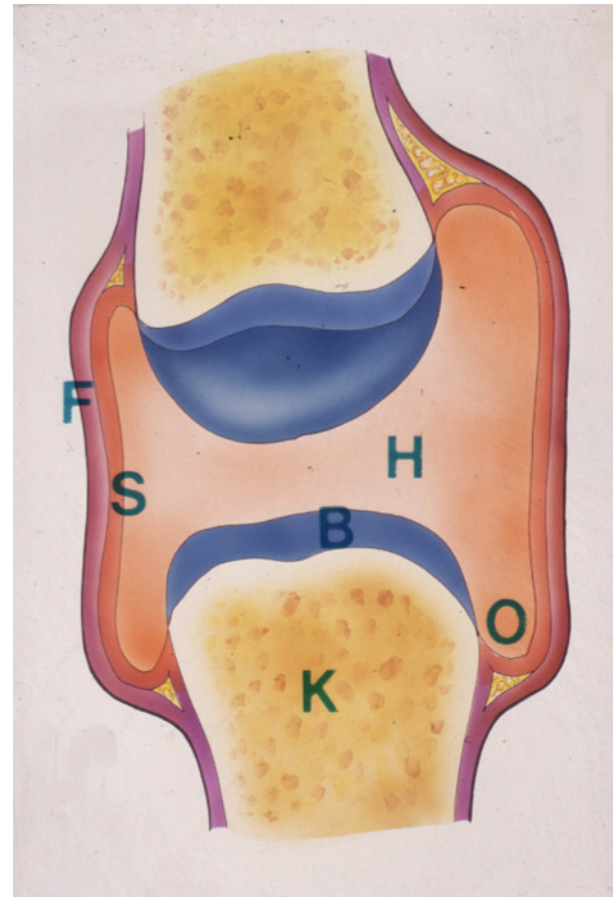
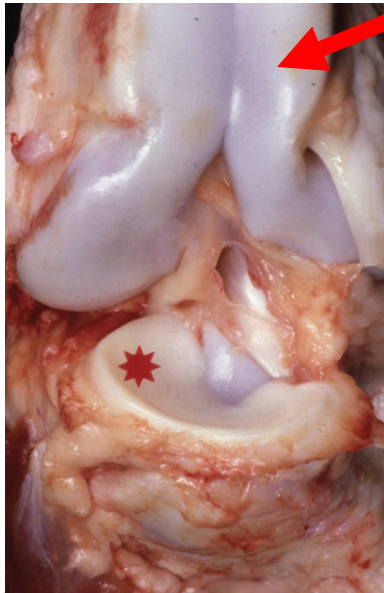
# ÆGTE LED

- LEDBRUSK
  - gør knogleender glatte og eftergivelige
  - ernæres af ledvæsken



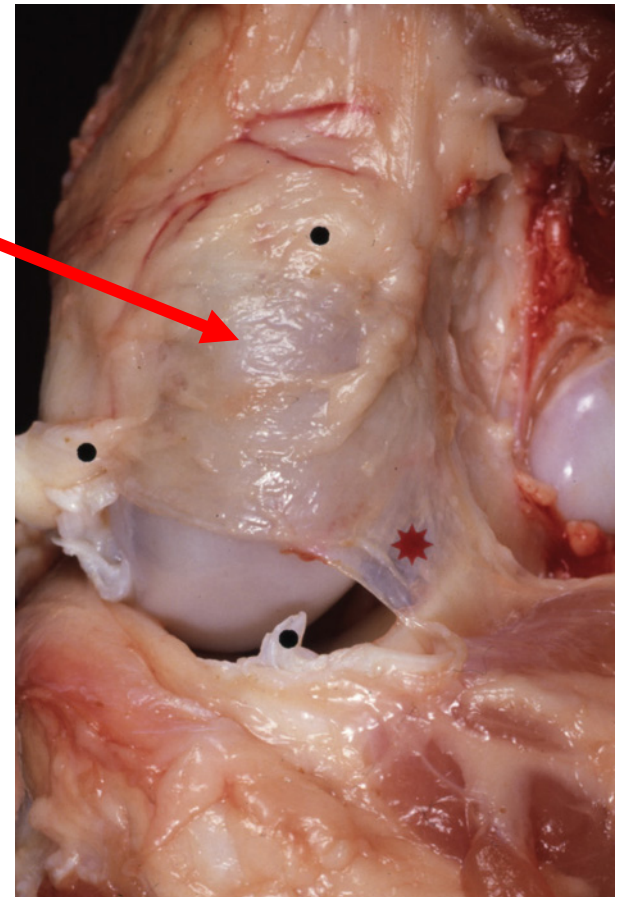
# ÆGTE LED

- LEDBRUSK
  - her hyalinbrusk



# ÆGTE LED

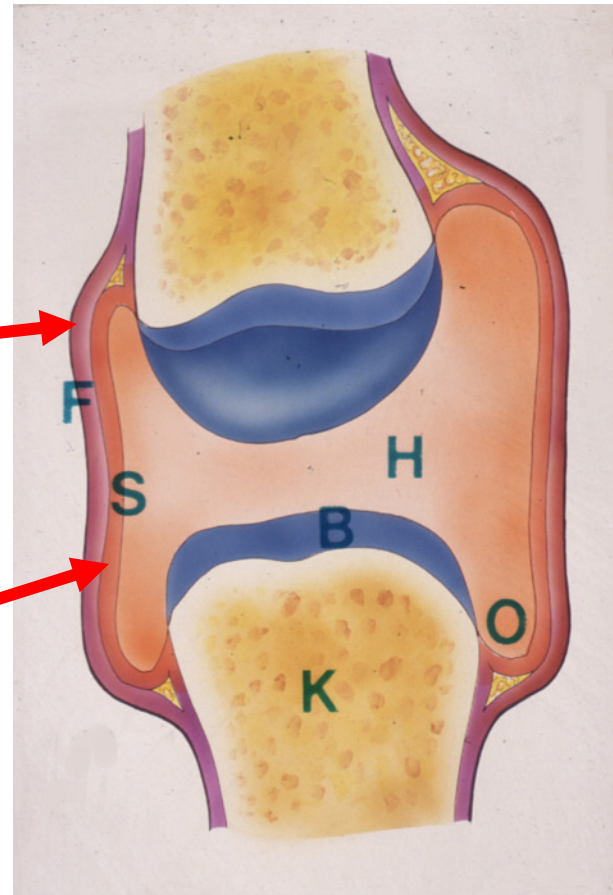
- LEDKAPSEL
  - holder knogleender sammen
  - aflukker ledhule



# ÆGTE LED

- LEDKAPSEL

- *membrana fibrosa*
  - fortsættelse af periost
  - fibrillært kollagent organiseret bindevæv
- *membrana synovialis*
  - fortsættelse af bruskrande
  - flade bindevævsceller



# ÆGTE LED

- LEDBÅND
  - kaldes også ligamenter
  - løber et stykke væk fra leddet



# ÆGTE LED

- LEDBÅND
  - fx ligamenter i kæbeleddet som er indvævet i en kapsel
  - ledbånd løber et stykke væk fra leddet

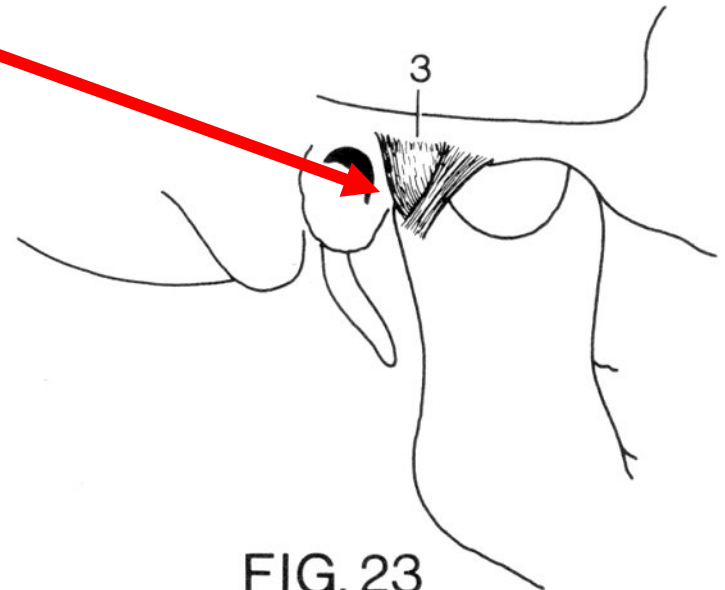


FIG. 23

# ÆGTE LED

- LEDSKIVER
  - ***discus articularis***
    - *deler ledhulen i to*
  - ***menisci articularis***
    - *deler ufuldstændigt*
- altid fibrocartilago

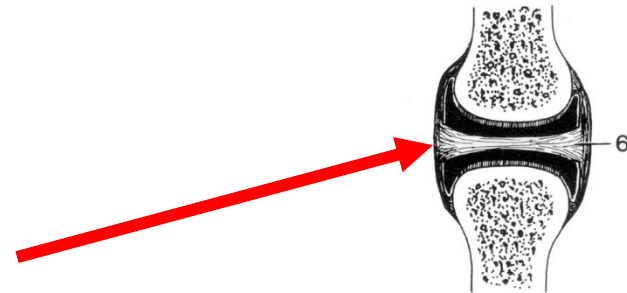


FIG. 5

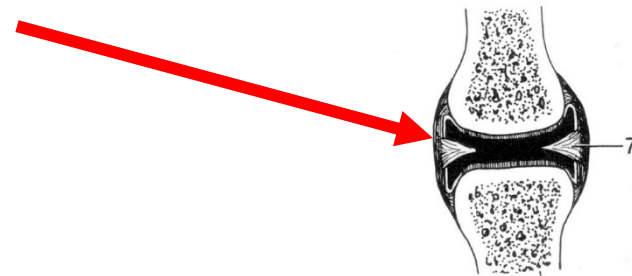


FIG. 6



# INDDELING AF ÆGTE LED

- GLIDELED
- CYLINDERLED
  - Hængselled
    - Ledhovedet valseformet
    - Ledskål konkav
  - Drejeled / Tapled
- KUGLELED
  - Ledhovedet kugleformet

# INDDELING AF ÆGTE LED

- GLIDELED



FIG. 7

# INDDELING AF ÆGTE LED

- CYLINDERLED
  - Hængselled
    - Ledhovedet valseformet
    - Ledskål konkav

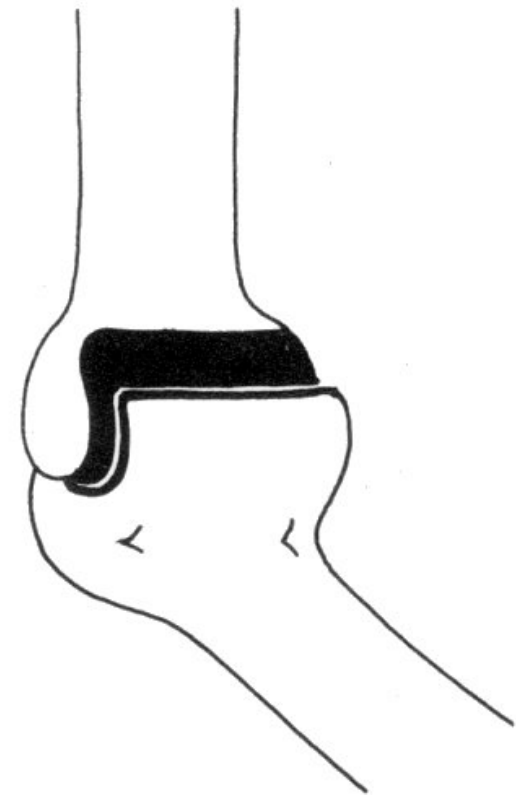


FIG. 8

# INDDELING AF ÆGTE LED

- CYLINDERLED
  - Drejeled / Tapled

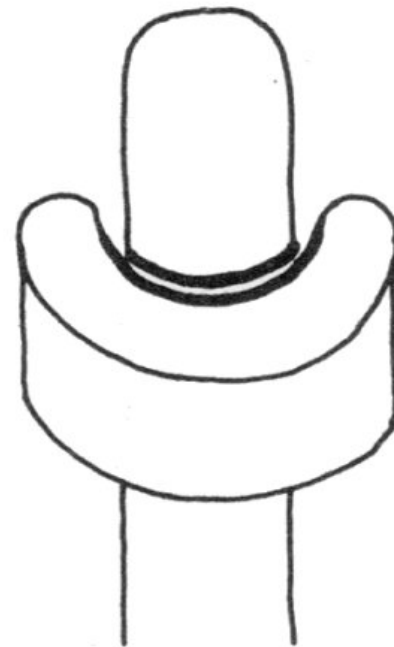


FIG. 9

# INDDELING AF ÆGTE LED

- KUGLELED
  - Ledhovedet kugleformet

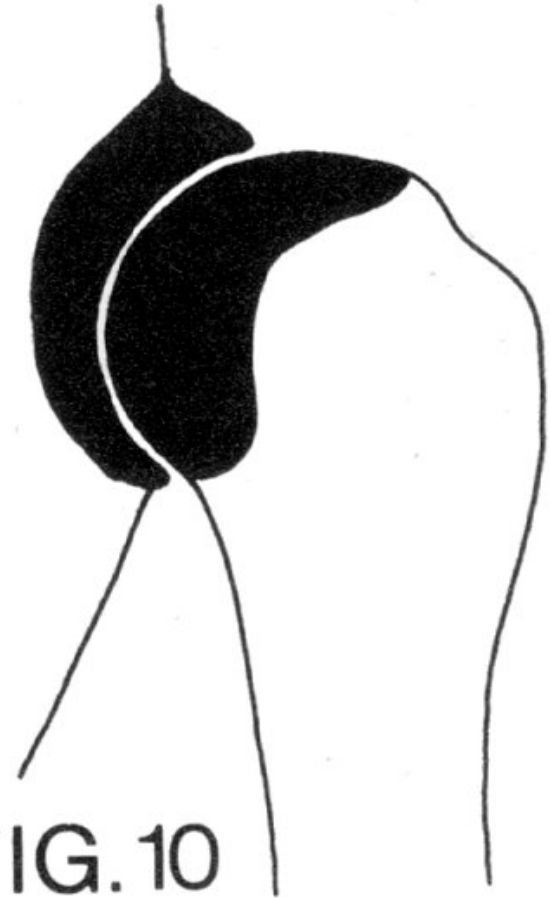


FIG. 10

# LED

- HVIRVELSØJLENS LED
- BRYSTKASSENS LED
- BÆKKENETS LED
- OVEREKSTREMITETENS LED
- UNDEREKSTREMITETENS LED
- KRANIETS LED

# LED

- HVIRVELSØJLENS LED
- BRYSTKASSENS LED
- BÆKKENETS LED
- OVEREKSTREMITETENS LED
- UNDEREKSTREMITETENS LED
- KRANIETS LED

# HVIRVELSØJLENS LED

- Led mellem hvirvellegemer
- Led mellem hvirvelbuer
- Nakkeleddene



# Led mellem hvirvellegemer

Uægte led:

- Synchondroser
- Syndesmoser

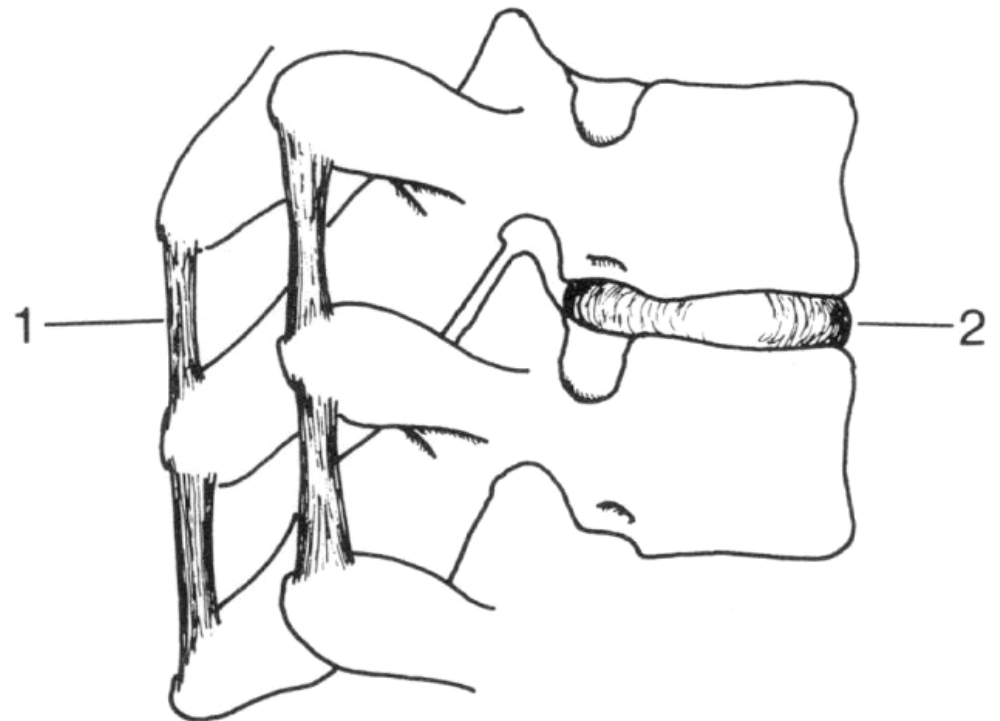


FIG. 1

# Led mellem hvirvellegemer

- Synchrondroser
  - **Disci intervertebrales**
    - nucleus pulposus (blød kerne)
    - anulus fibrosus (solid perifer del)
    - diskusprolaps

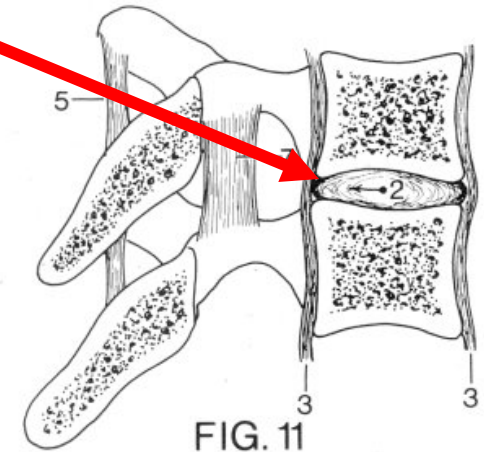
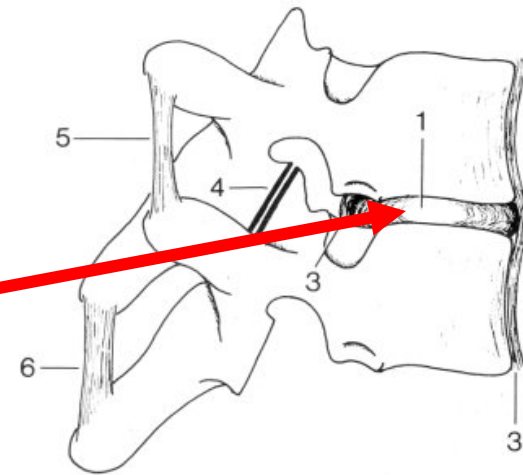
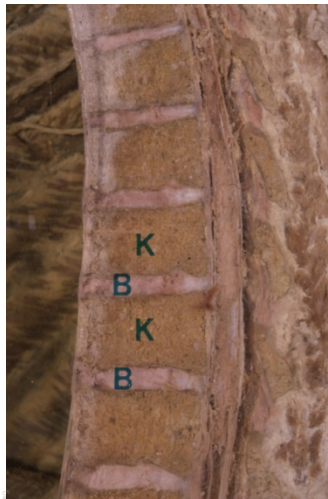


FIG. 11

# Led mellem hvirvellegemer

- Syndesmoser
  - **Ligamentum longitudinale anterius**
    - på forflade af hvirvellegeme
  - **Ligamentum longitudinale posterius**
    - på bagflade af hvirvellegeme

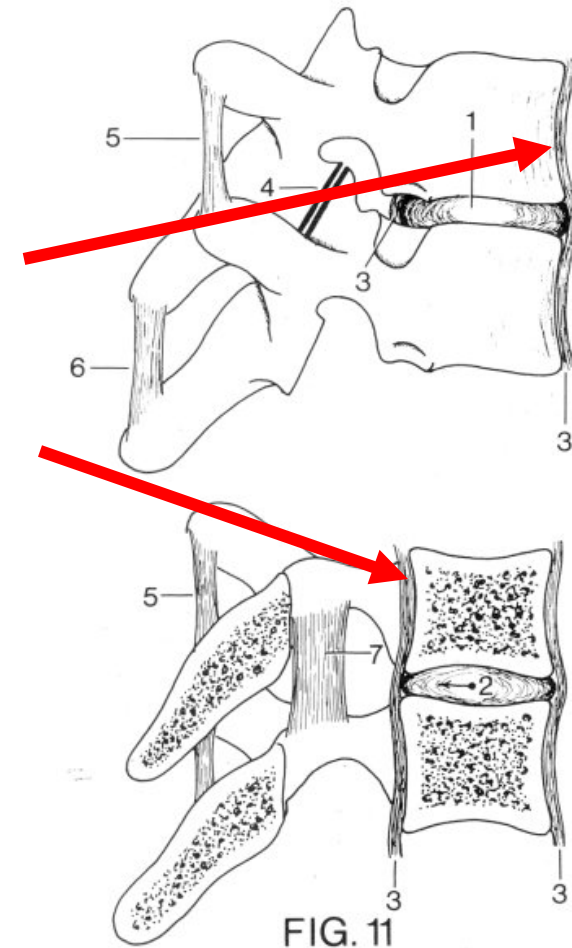
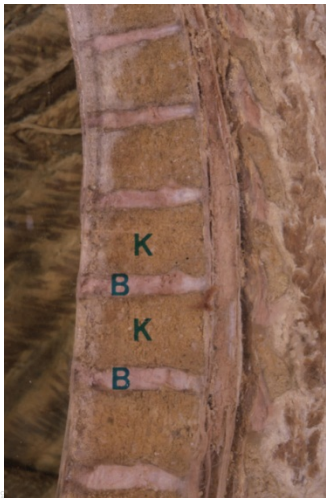
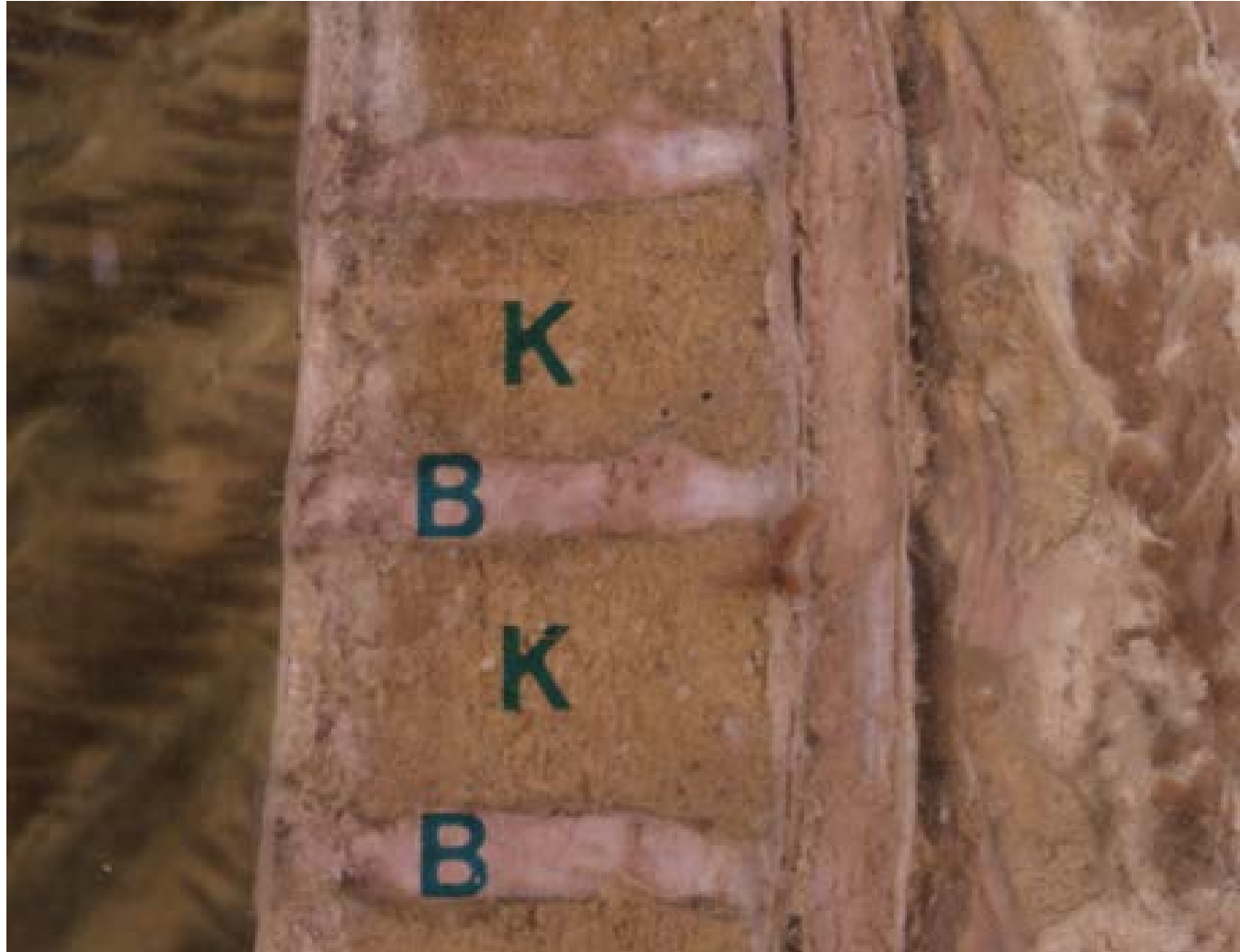


FIG. 11

# Snit gennem columna vertebralis



# Led mellem hvirvelbuer

- Ægte Led
- Uægte led

# Led mellem hvirvelbuer

- Ægte Led
  - mellem ledtappe
  - articulationes intervertebrales ("zygapophysialis")

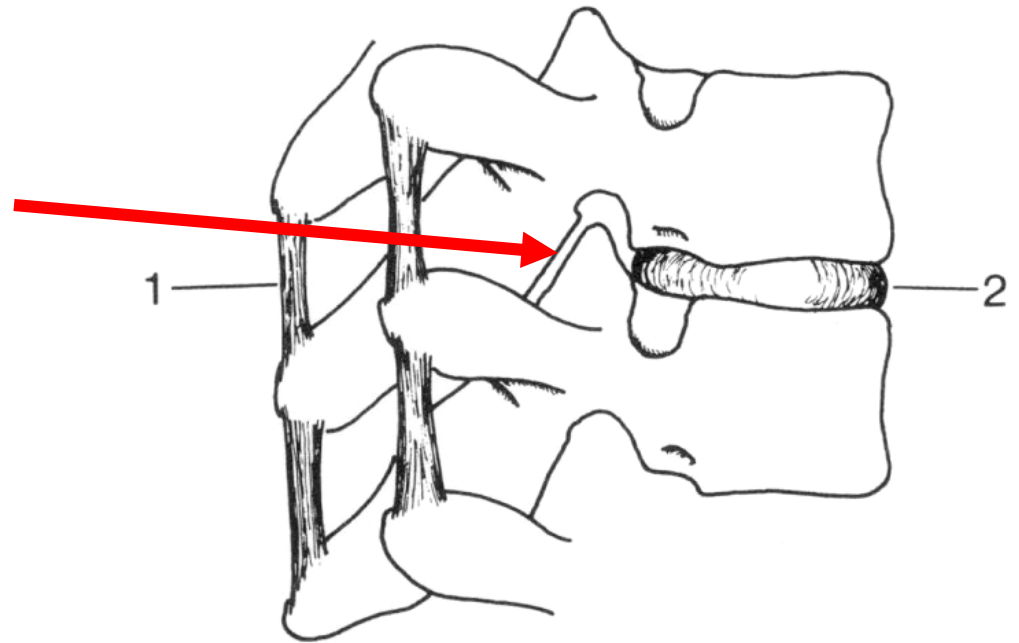


FIG. 1

# Led mellem hvirvelbuer

- Uægte led
  - syndesmose
    - Fibrøse led  
ml. tvær- og torntappe
    - Elastiske led  
ml. hvirvelbuer

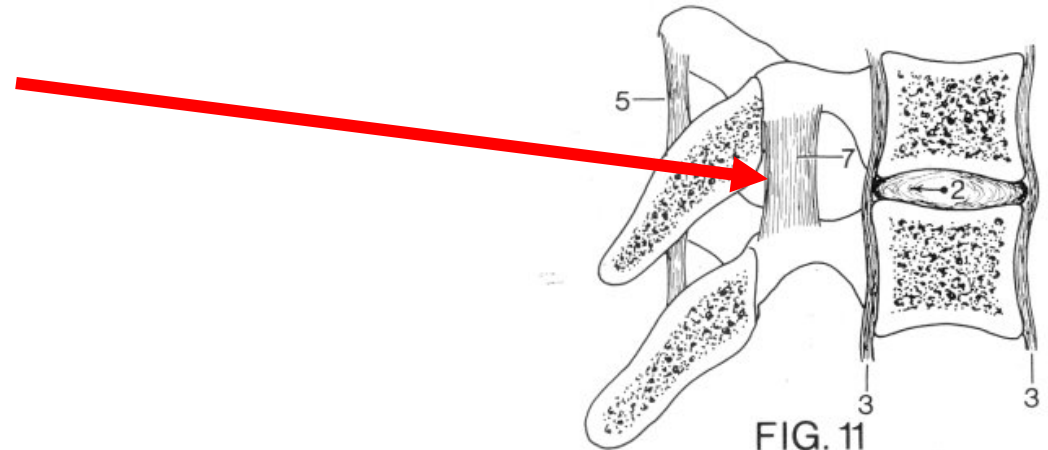
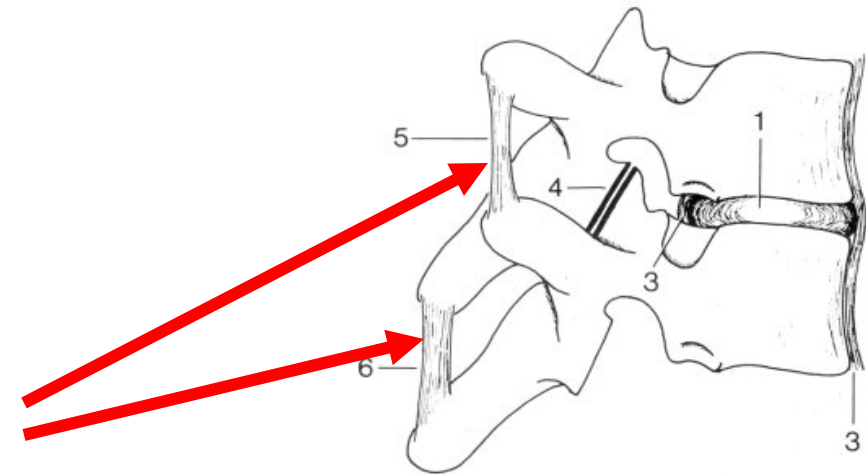


FIG. 11

# Nakkeled

- **Articulationes atlantooccipitalis**
  - **ÆGTE LED**
    - laterale glideled
    - condyli occipitalis
    - ledtappe på atlas

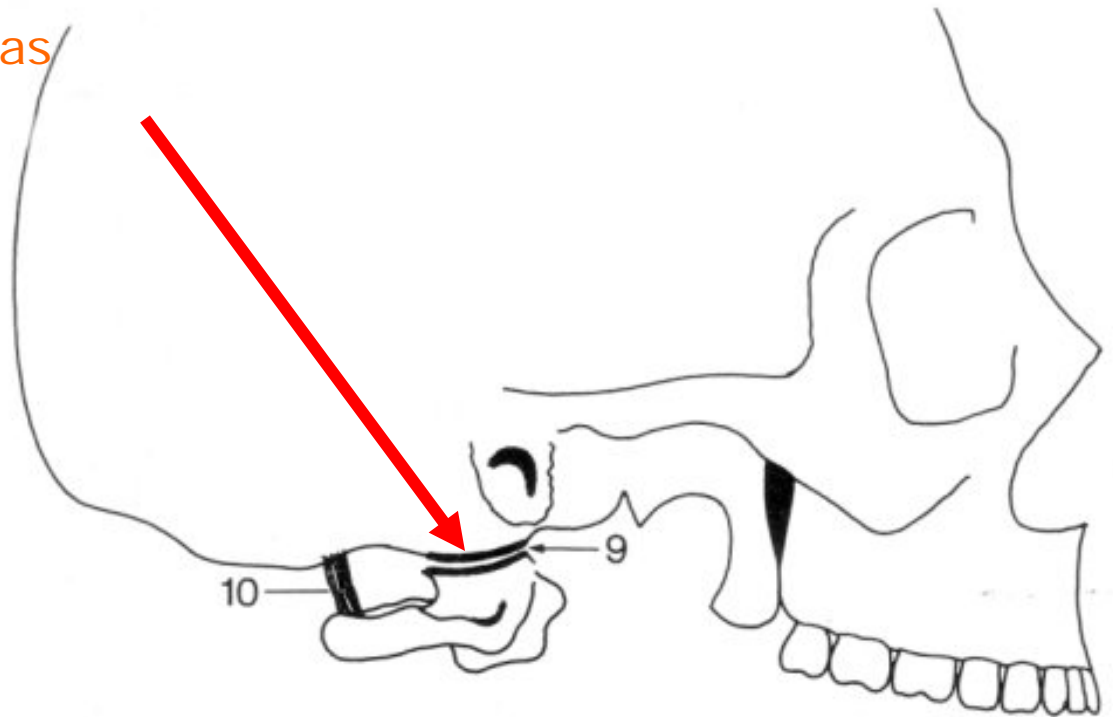


FIG. 13



# Nakkeled

- **Articulationes atlantooccipitalis**
  - **UÆGTE LED**
    - Membraner for- og bagtil
    - mellem arcus og nakkebenet

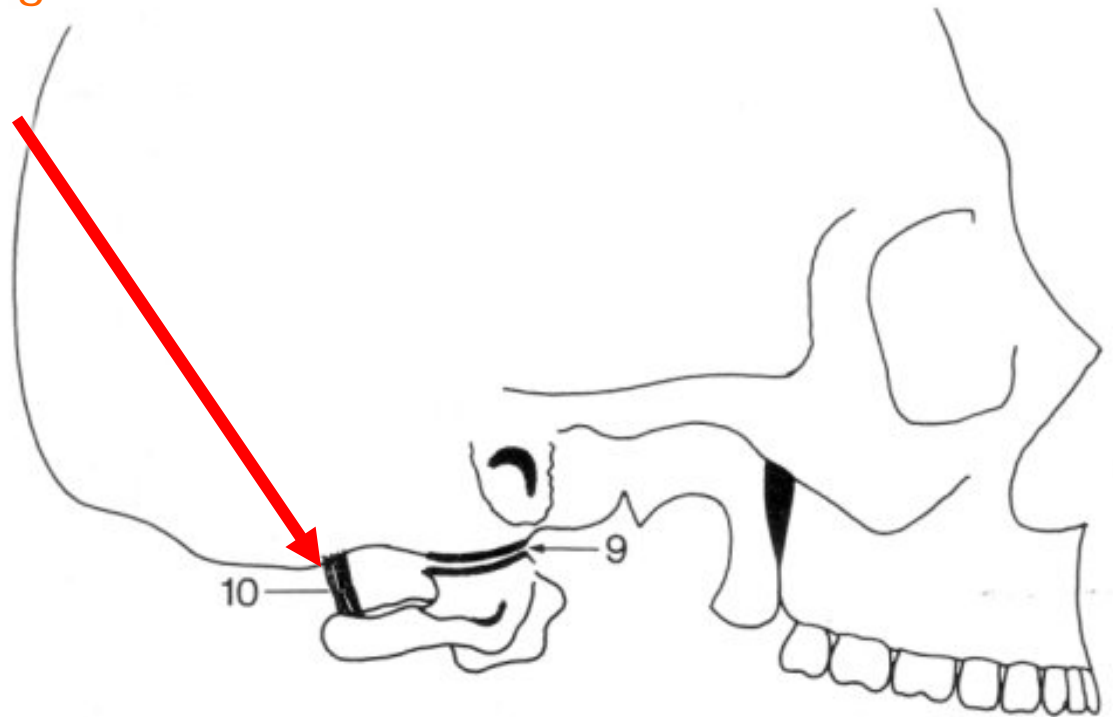


FIG. 13

# Nakkeled

- **Articulationes atlantooccipitalis**
  - nikke- og vugge-bevægelser

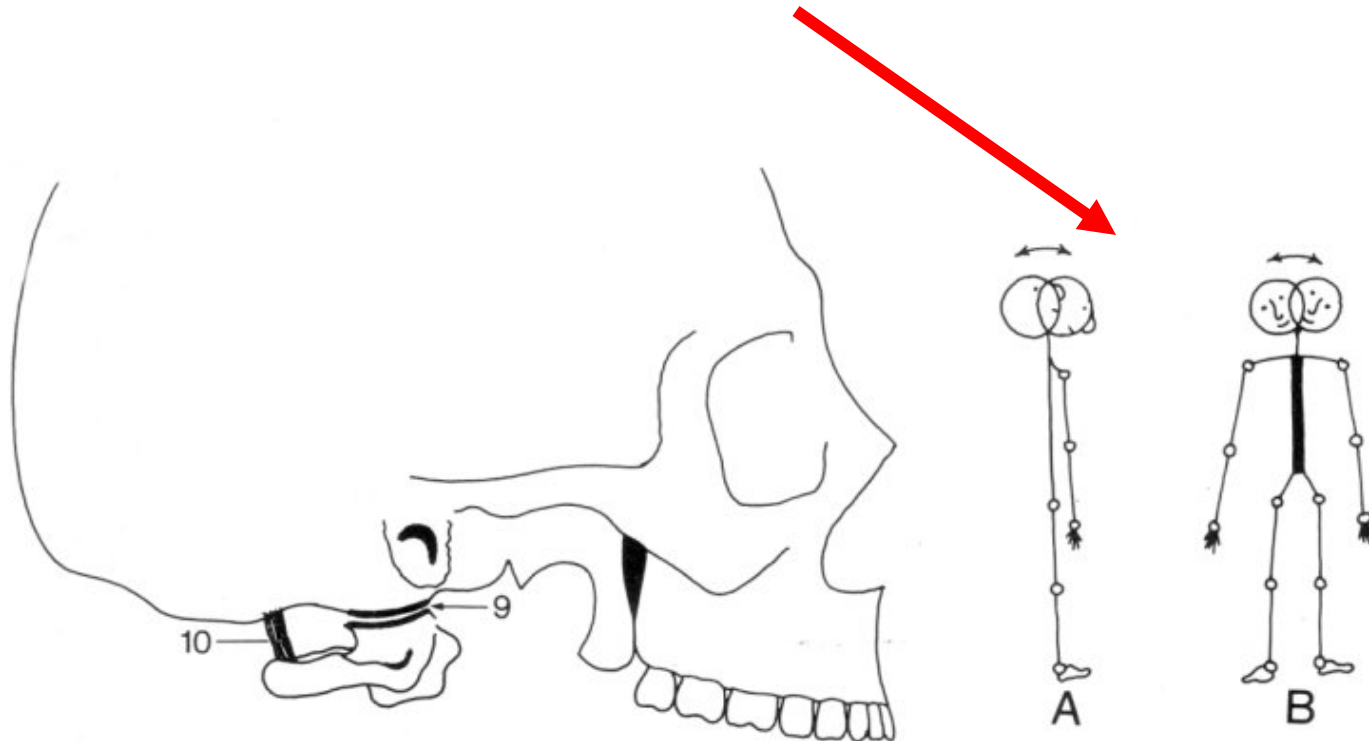


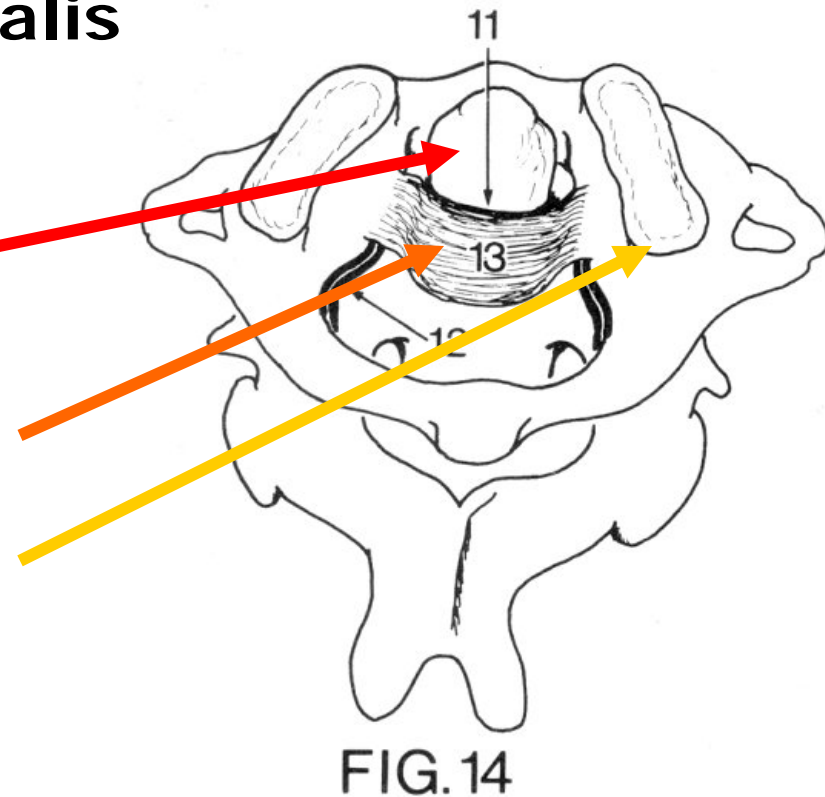
FIG. 13

# Nakkeled

- **Articulationes atlantoaxialis**

## ÆGTE LED

- tapled (drejeled)
- ligamentum transversum atlantis
- laterale ledtappe (glideled)



# Nakkeled

- **Articulationes atlantoaxialis**

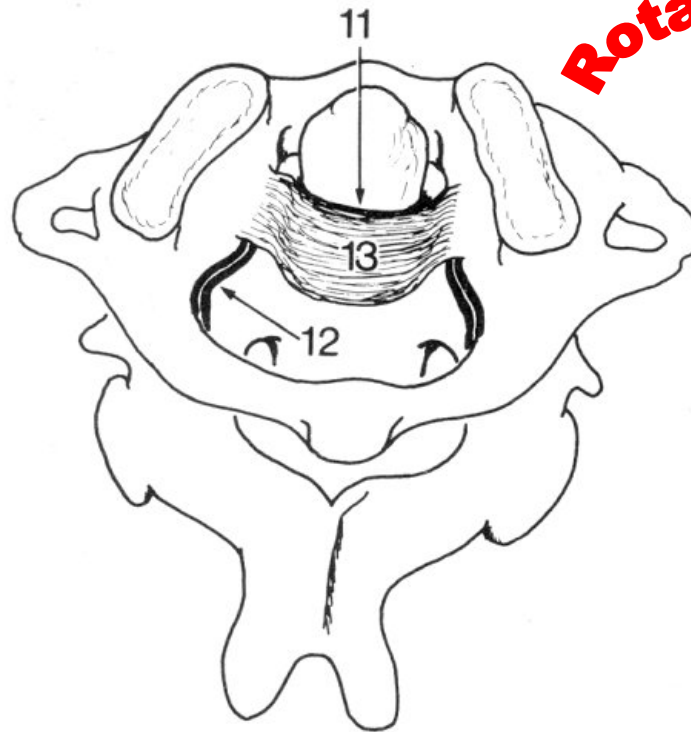
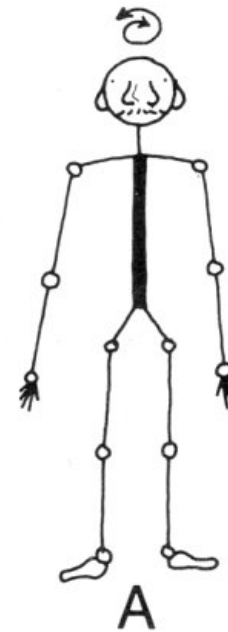


FIG. 14

**Rotationsbevægelse**





# HOVEDETS LED

- Uægte led
  - suturer (fibrøse syndesmose)
  - synchondroser
- Ægte led

# HOVEDETS UÆGTE LED

## SUTURER

- Kranssømmen  
(sutura coronalis, 1)
- Pilsømmen  
(sutura sagittalis, 2)
- Lambdasømmen  
(sutura lambdoidea, 3)
- Skælsømmen  
(sutura squamosa, 4)

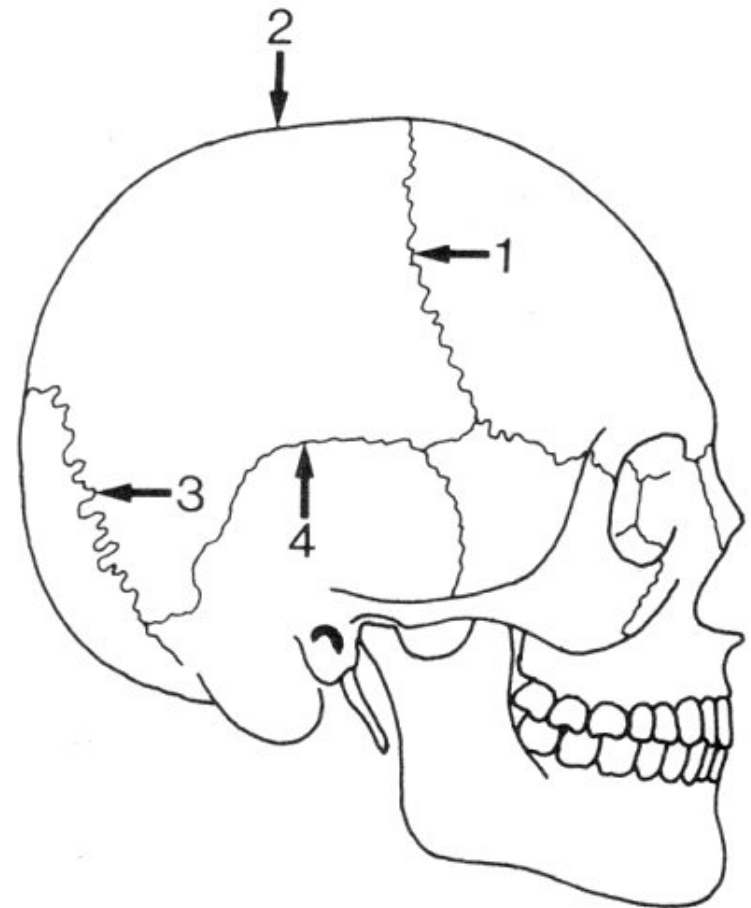


FIG. 21

# HOVEDETS UÆGTE LED

## SYNCHONDROSER

- **Synchondrosis sphenoccipitalis** (clivus)

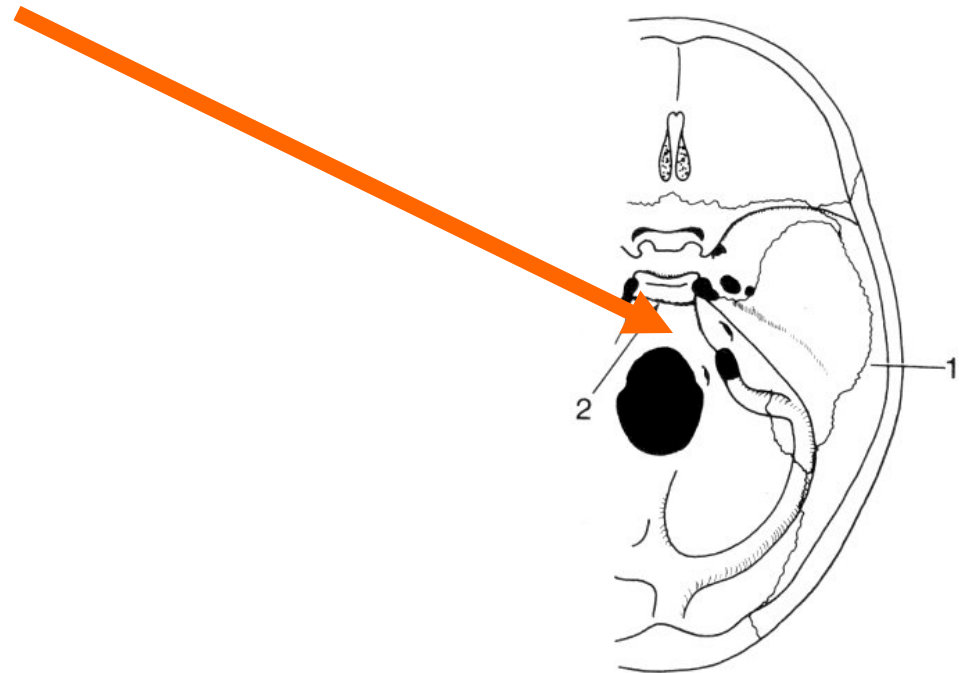


FIG. 22



# HOVEDETS ÆGTE LED:

- Articulatio temporomandibularis

- Caput mandibulae

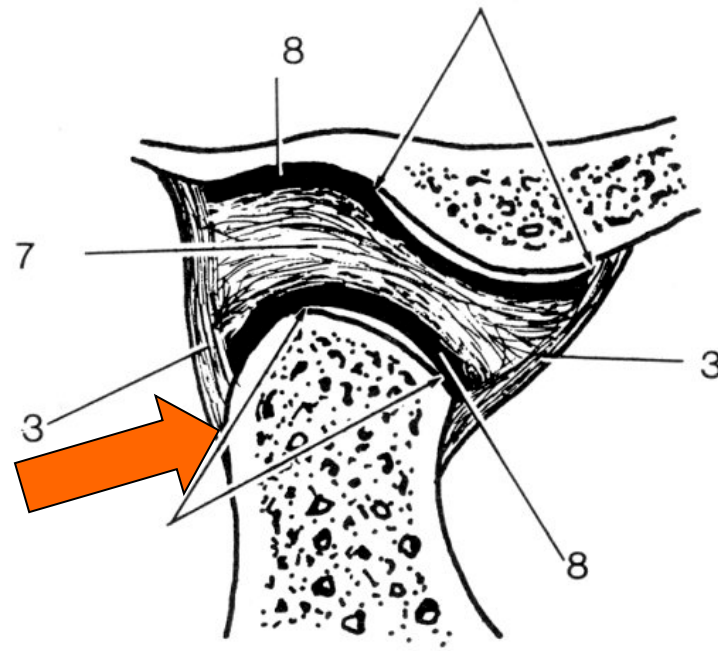
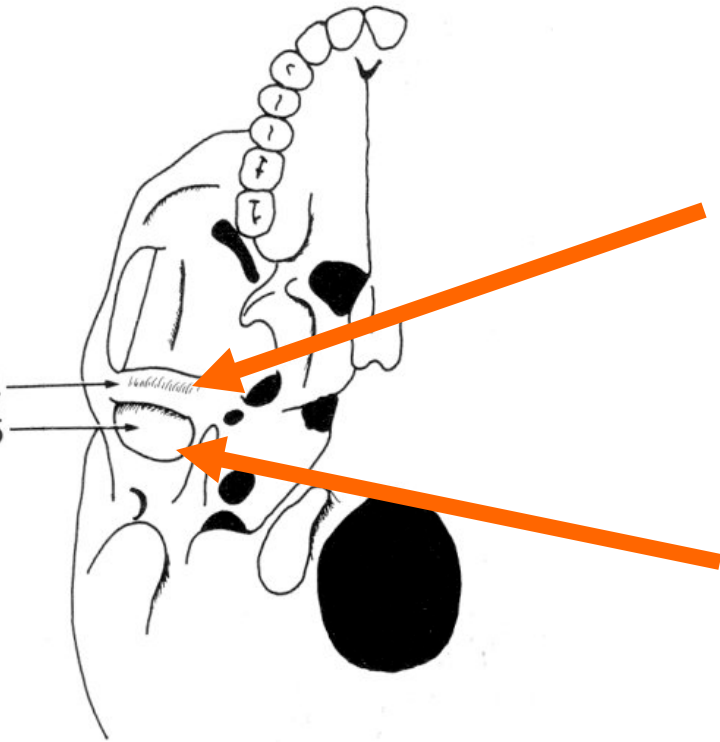


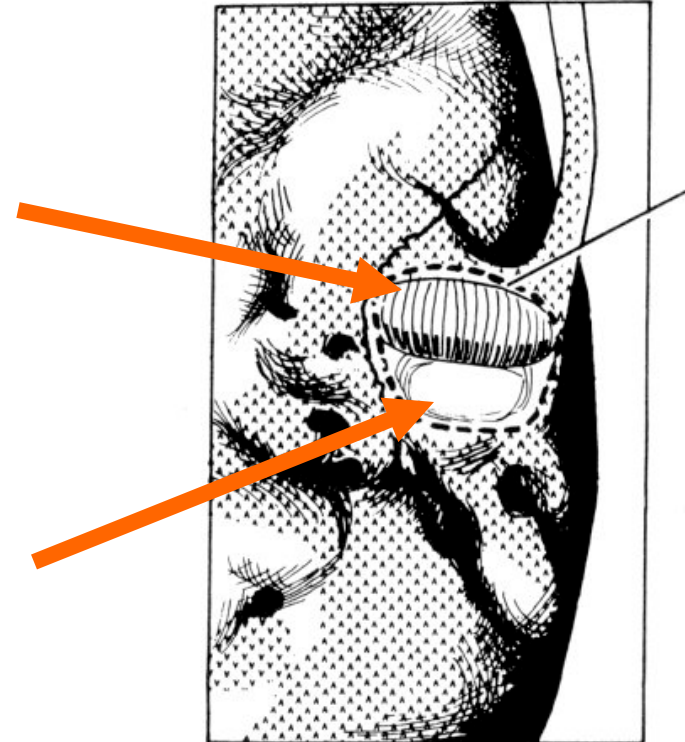
FIG.26

# Articulatio temporomandibularis



Tuberculum  
articulare

Fossa  
mandibularis



# Articulatio temporomandibularis

- Discus articularis
  - Oval skive
  - Fibrocartilago
- Ledkapsel

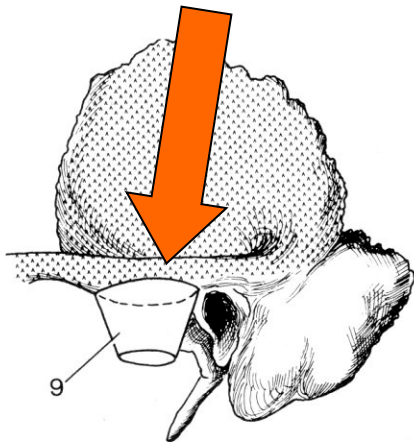


FIG.27

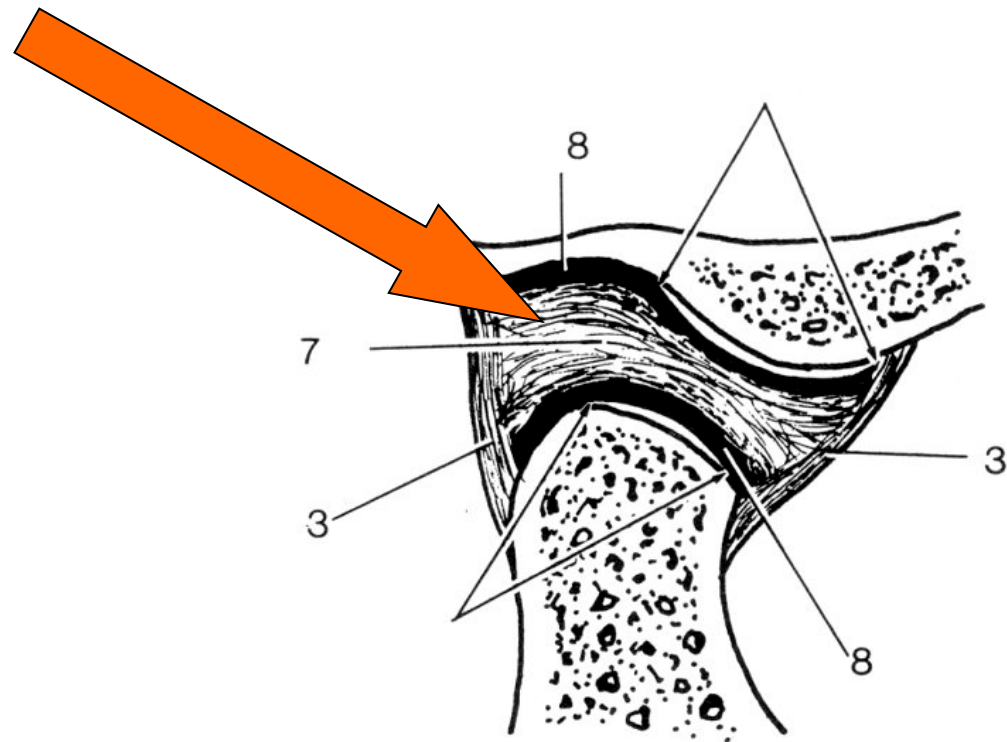


FIG.26

# Articulatio temporomandibularis

- hængselbevægelser foregår i nedre ledkammer

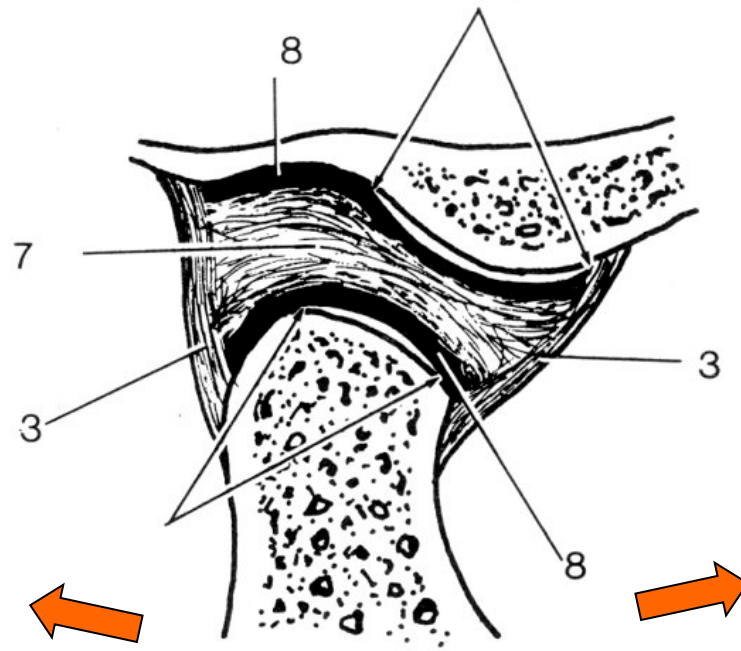


FIG.26

# Articulatio temporomandibularis

- glidebevægelser foregår i øvre ledkammer

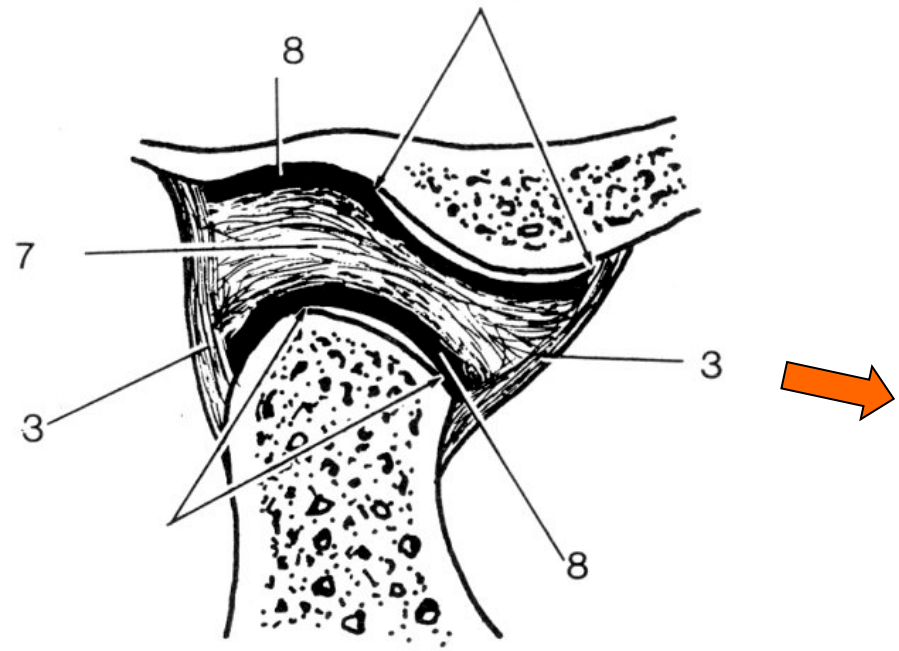
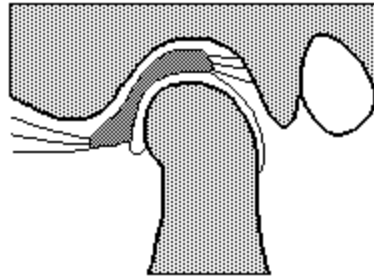


FIG.26

# Articulatio temporomandibularis



# TMJ Muscles of mastication (youtube)

- [TMJ Muscles of mastication.mp4](#)

# Tak for nu



<http://www.blackwellscience.com/matthews/myosin.html>