

# Bones, joints, construction of the pelvis



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2018.

OMNIVM HVMANI CORPORIS OSSIVM SIMVL SVA SEDE COMMISSORVM.  
OMNIEVSQUE PORTIBVS QVABVS STABILIPNT. QVAEQVE ILLIS  
aduiscuntur, ut ab ipsis producent liberorum integras deliciatio-

CHARACTERVM HYLIC OMNIVM  
volum imaginem ostendentis figurae index.

**E**T S.T. in figura ad traditionem hanc respondebita. Ego  
non poteris, et propositum non intelligimus, que nullus possit  
revisus non dilatari, et non recessus, quare natus est. Hoc autem  
negatibus, non ait de Natura, in hinc figuram aliquip veniret ex  
proposito, sed de tradicione, per cuius illius omnia effe  
runt extenuationes figurae, has magis evanescere ac palliori fe  
tore. Propositum quod hanc figuram valuerit, cu[m] similit  
tum invenerit, adhuc una certissima et magnifica reverentia ex aliis  
organis efficitur. Brevitatem figurae. Vnde charactere. Finita modis  
reservata.

**A**ndicatur regalisque anatomie frumenta auctoritate, reverendis  
dilectis.

**B**ella diversa mortalia sunt, que a magna proprie, et a  
causa reverentia alteracione, et vero hinc ad nullum frumentum  
punctum, et nullam figuram invenerimus.

**D**icitus tempore obitum obire, diversi spaciores quod trahunt rever  
entiam, confluens, rite ab imagine emundantur et colliguntur. Ratiq[ue] vero  
colliguntur interius mortale factum que somnium proprii dol  
orem emundantur, et libenter.

**E**st alteracione mortis, vel paucis annis, vel paucis annis, et cromata fer  
entia mortis, et non ipsius, et non satis primum percepit. In hinc  
ad cromata cromata amplius et colligitur, qui caput colla  
mentum apparet.

**G**regorius de quadruplici manu similitudine annos.

**D**iversi corporis et ossium proprietas, et hoc non ante galli calidaria  
imagine conformati, et compliciti, ut aris velutina papillae confi  
gitur.

**H**ec calidaria facta ab imagine et deriva quoniam cum proxima recta  
fundiuntur, nonne id est, quod proxima tunc dantibus effici  
tur affectiones.

**I**ctus vero et differentia processus comparatur. Et non processus,  
qua[de]cim et similitudines, et magnitudines.

**P**er hanc calidaria factam diversissime efformatae processus, perinde  
autem terribiliter efficiuntur et afficiuntur. Et sponte autem mortali  
te efficitur, dum non est in corpore, qui immobile certat,

et non est in corpore, qui immobile certat, et tunc.

**G**loriosa mortalia, similitudine ac figurae, feliciter dicitur hoc, ut placuisse  
debet.

**H**oc et magnificum experimentum, utrum et nonne, et plenior credat  
ad hanc diccionem.

**I**Et regis hinc obitum cromata belum, non reverentiam exal  
tantes, parvum advenit, et negliguntur, vellent donec tanta  
tanta studi, hoc dicendum, nonne conformatum adhuc anno? Tunc  
enim etiam processus, et diversissime efformatae.

**K. L. M. N.** Haec herculae, hoc dicitur obitum, quod omnes  
ex cromatice regimur, et K. ad K. reverentia collum efficitur,  
et hunc ad L. reverentia, et hunc ad M. reverentia, et N. rever  
entia. Et sic facilius dicimus, quaeque ad L. ad re  
gorem M. facilius dicuntur, et regum M. quaeque M. facilius dicuntur, et p  
ropter M. facilius dicuntur, et regum N. quaeque N. facilius dic  
untur, et p. propter N. facilius dicuntur, et regum.

**P**er hanc etiam plenior credat ad hanc diccionem.

**Q. S. A. C. T. S. B. C. D.** Nonne herculae, dicendum, istud inde  
inducere, quoniam sicut figurae et reverentia et processus efficiuntur  
hinc nonne non reverentia, neque sicut figurae, sed istud, et  
ad hanc etiam plenior credat ad hanc diccionem.

**Claude.** Hic similia, non reverentia processus, non reverentia humana dicimus,  
et religiosus reverentia, ut ab imagine magni confunditur, ut  
processus et reverentia abesse.

**Z. P. T. A. B.** Figura longa, et latitudine, et altitudine, et  
clericis efficitur, et non reverentia, et reverentia, et reverentia  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia.

**Z. X. Y. Z.** Unde herculae, istud enim est genitrix.

**Quatuor processus efficiuntur.**

**E**t in herculae figurae, et non reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia.

**P**er hanc etiam plenior credat ad hanc diccionem.

**Quatuor processus efficiuntur.**

**E**t in herculae figurae, et non reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia.

**P**er hanc etiam plenior credat ad hanc diccionem.

**Quatuor processus efficiuntur.**

**E**t in herculae figurae, et non reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia.

**P**er hanc etiam plenior credat ad hanc diccionem.

**Quatuor processus efficiuntur.**

**E**t in herculae figurae, et non reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia.

**P**er hanc etiam plenior credat ad hanc diccionem.

**Quatuor processus efficiuntur.**

**E**t in herculae figurae, et non reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia,  
et reverentia, et reverentia, et reverentia, et reverentia, et reverentia.

**P**er hanc etiam plenior credat ad hanc diccionem.

**Quatuor processus efficiuntur.**



SOLVITVR OMNE DECUS  
LETO, NIVEOSQUE  
PER ARTVS  
IT STYGIVS COLOR, ET  
FORMAE POPVLAS  
TVR MONO  
REB.

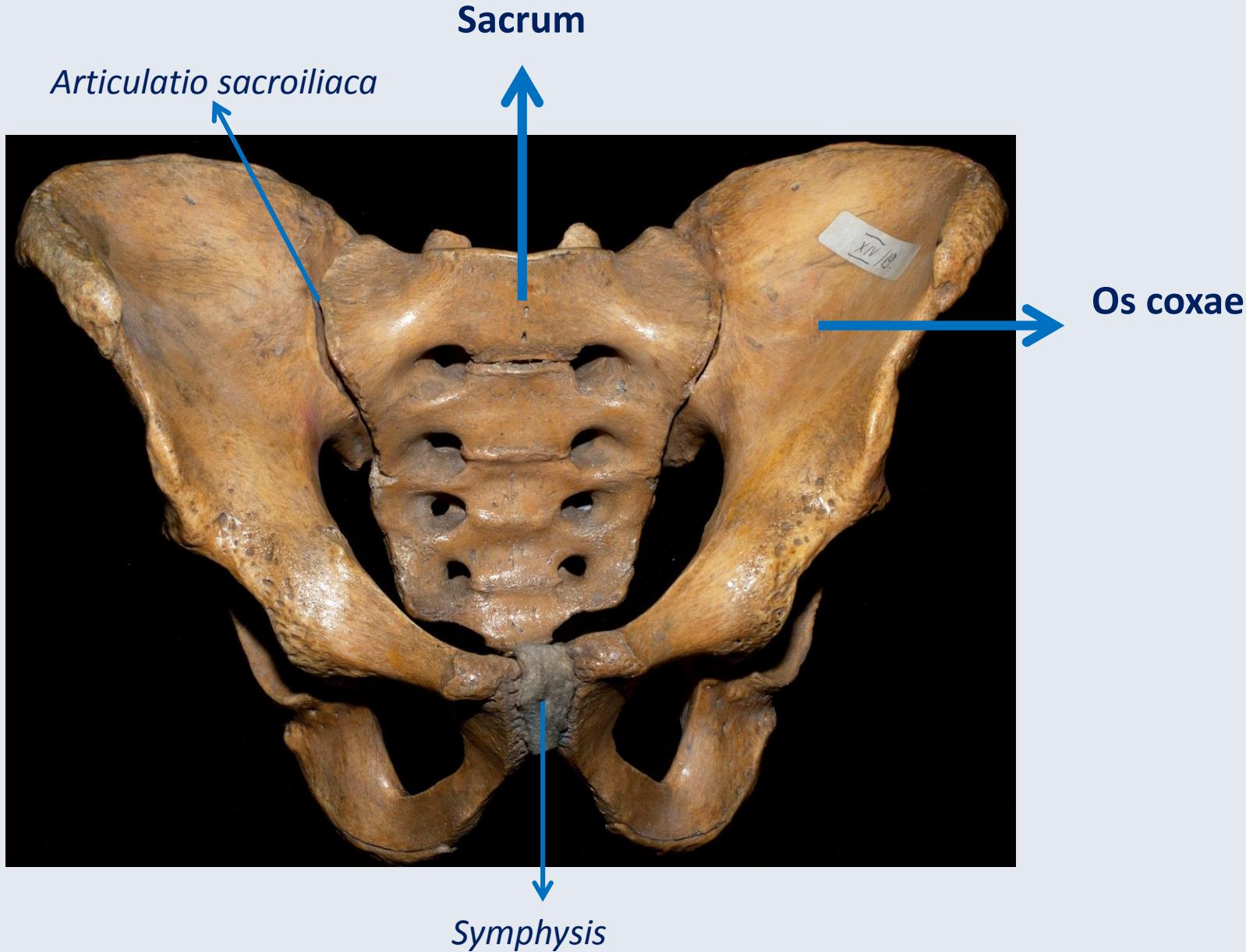
K EXTERNA.

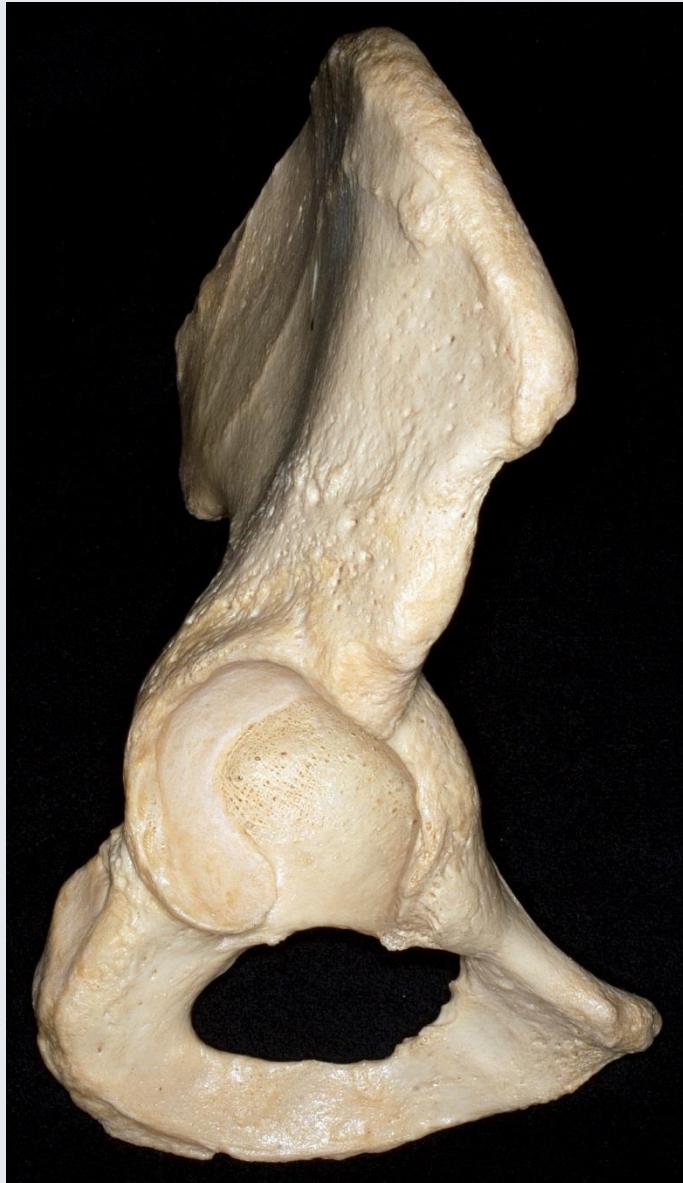
Calix et p[ro]p[ter]a usq[ue] ad longum reverentia.

Et rynchus et rynchus et rynchus et rynchus.

Quatuor rynchus et rynchus et rynchus et rynchus.

Folio 9v from the *Epitome of Vesalius*, Basel, 1543.



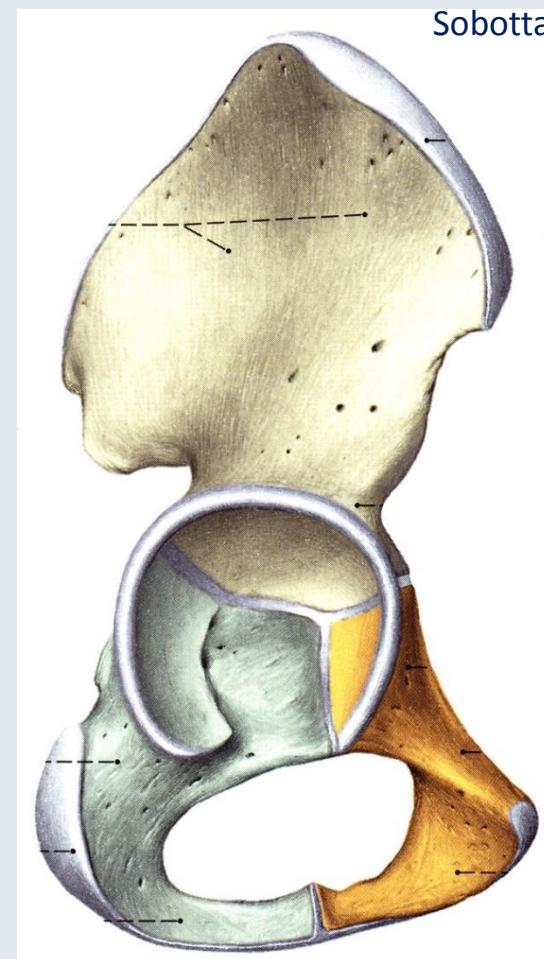


Adult

Os coxae

[

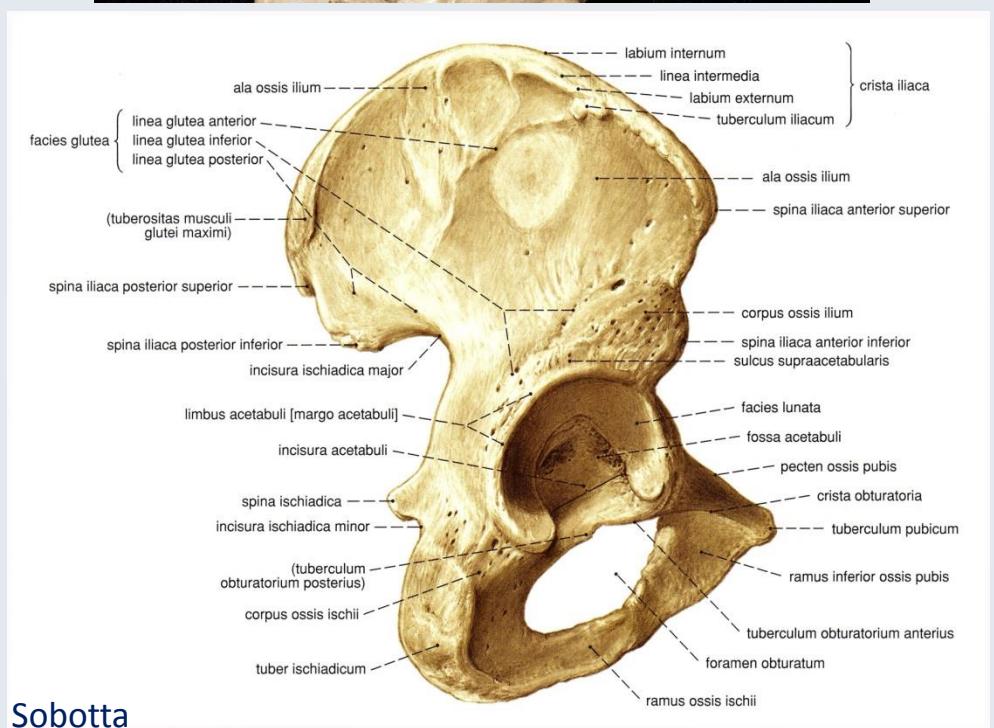
Os ilium  
Os ischii  
Os pubis



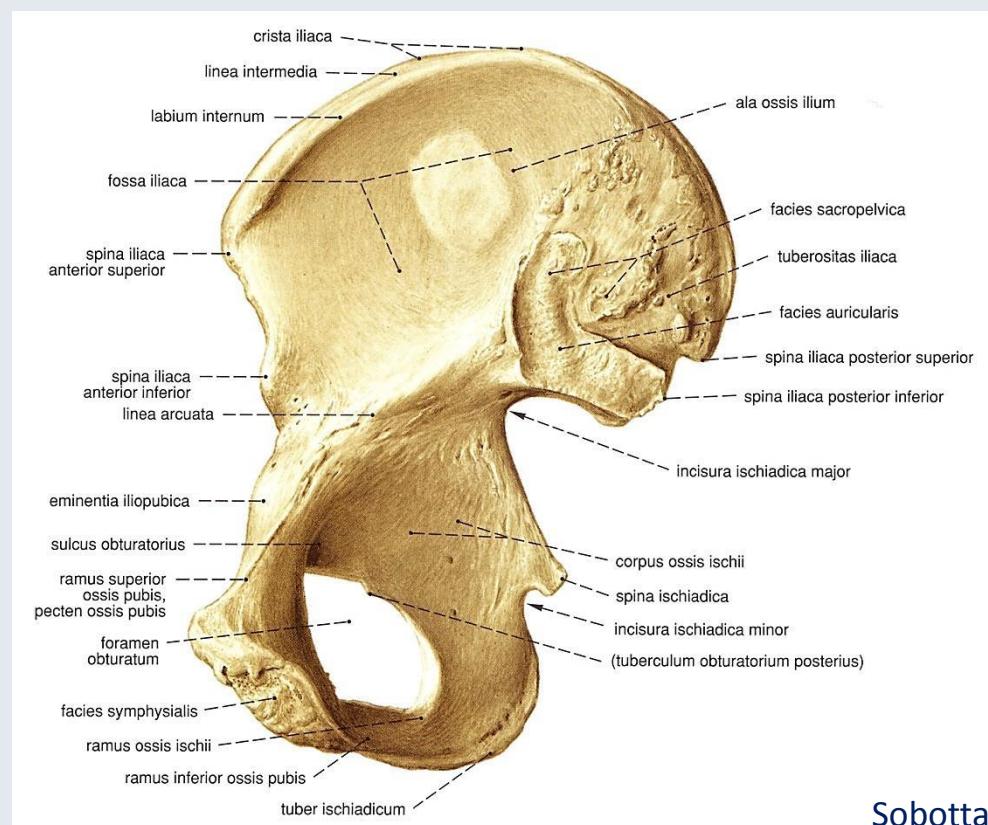
Child



Adult



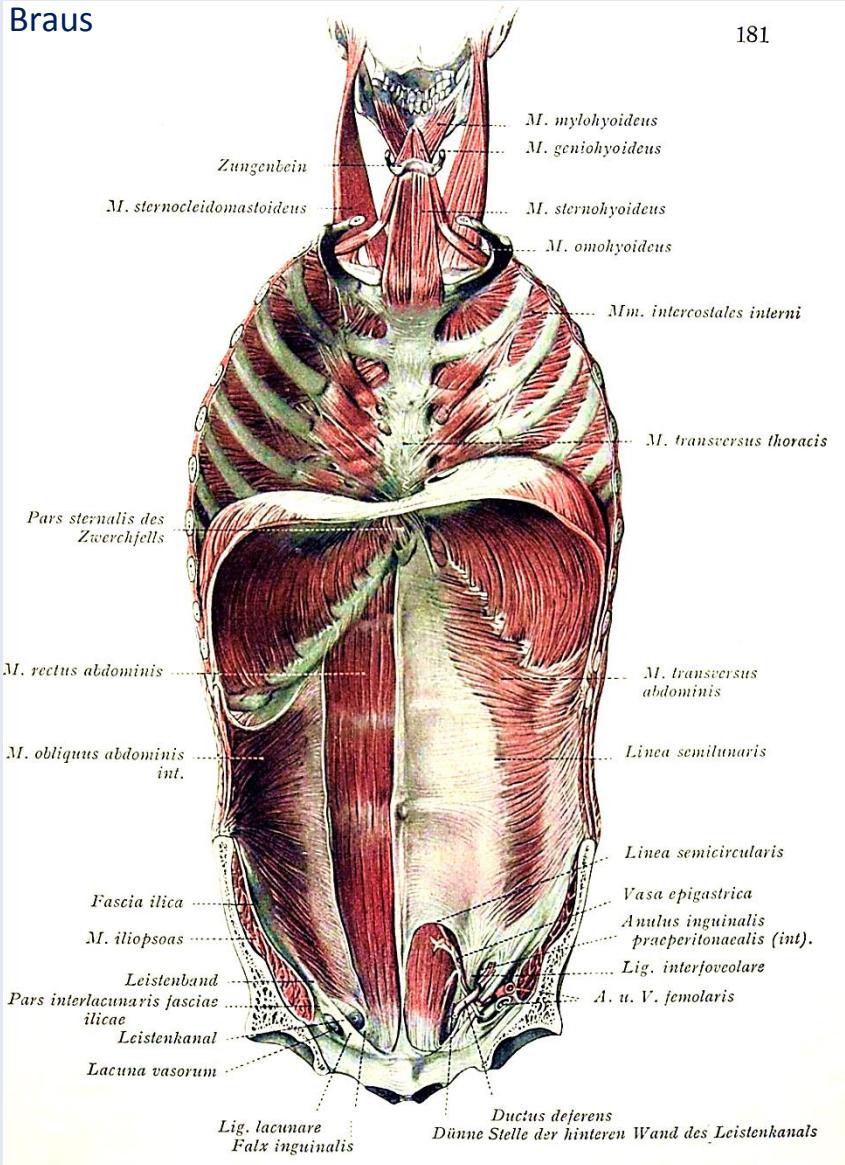
Sobotta





Braus

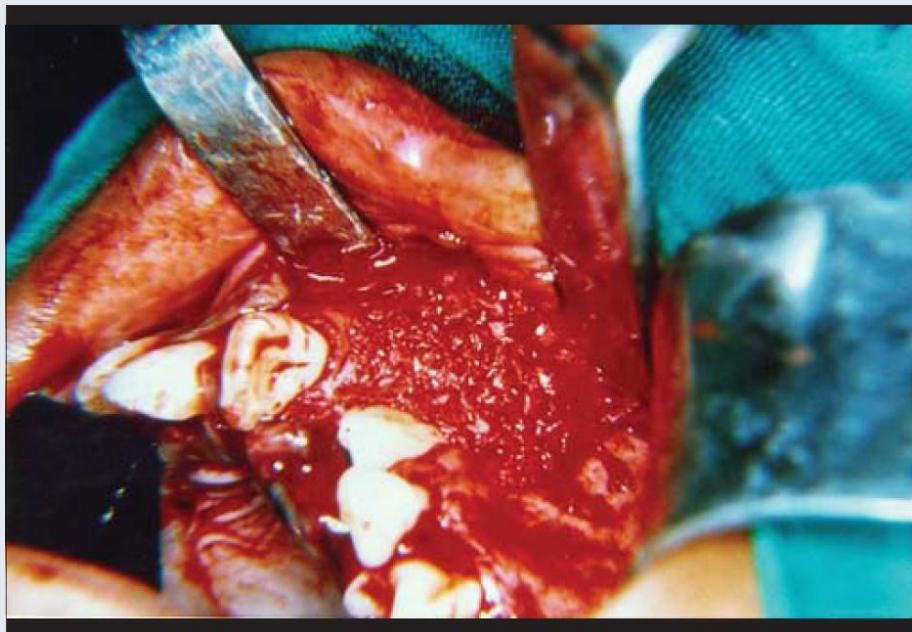
181



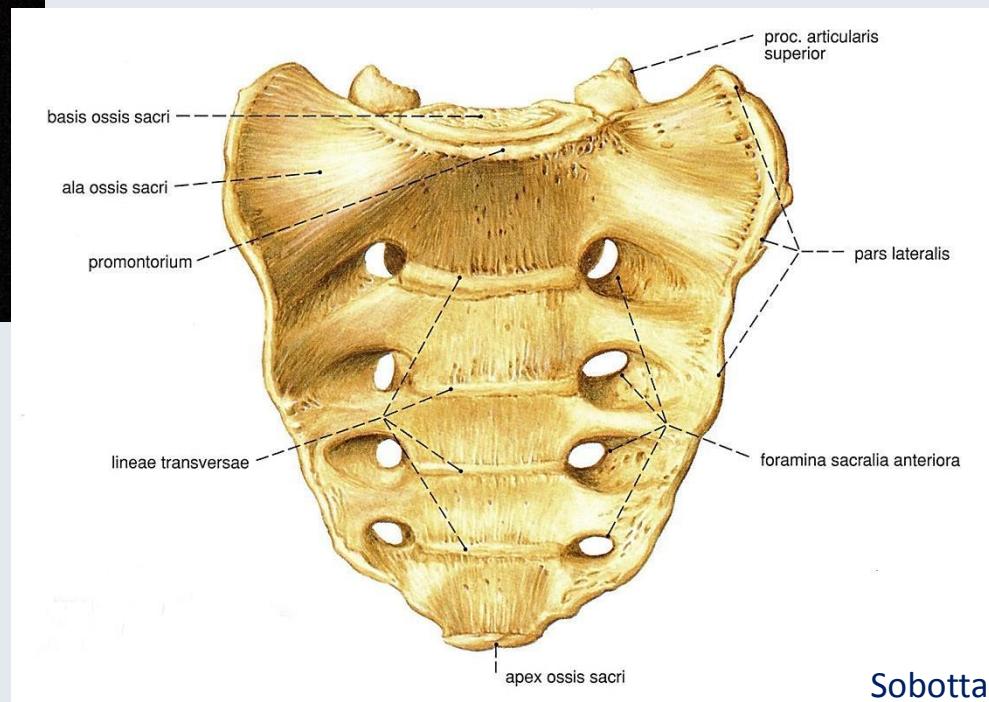


Sharma et al.

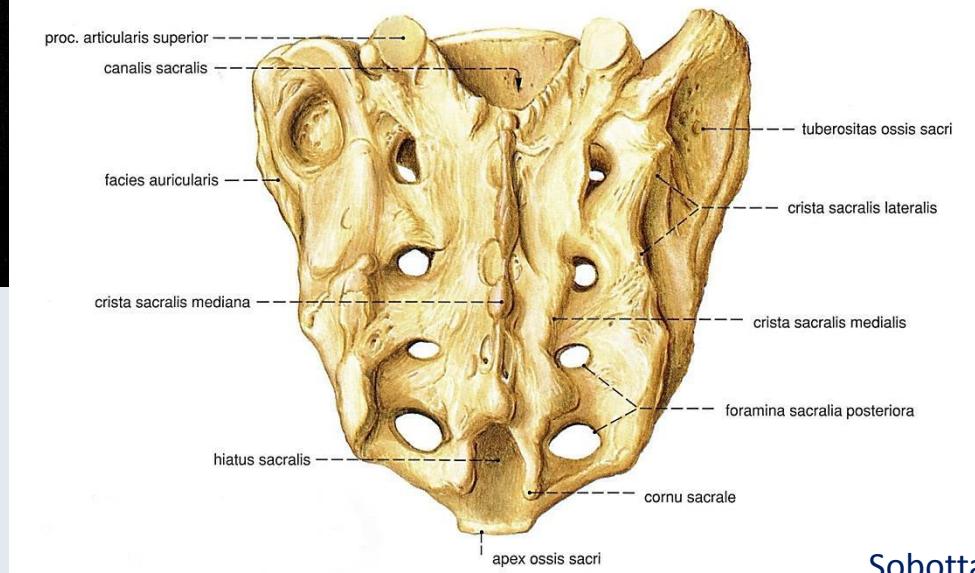
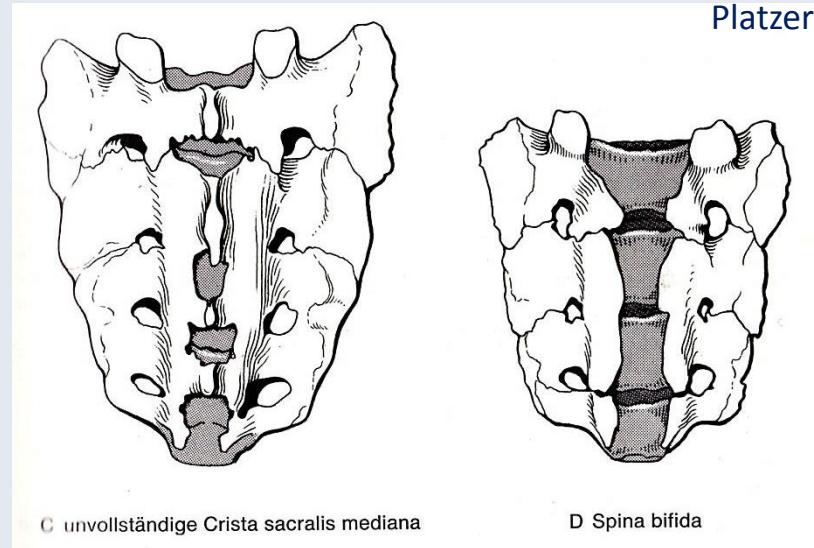
Bonegraft for maxillo facial surgery

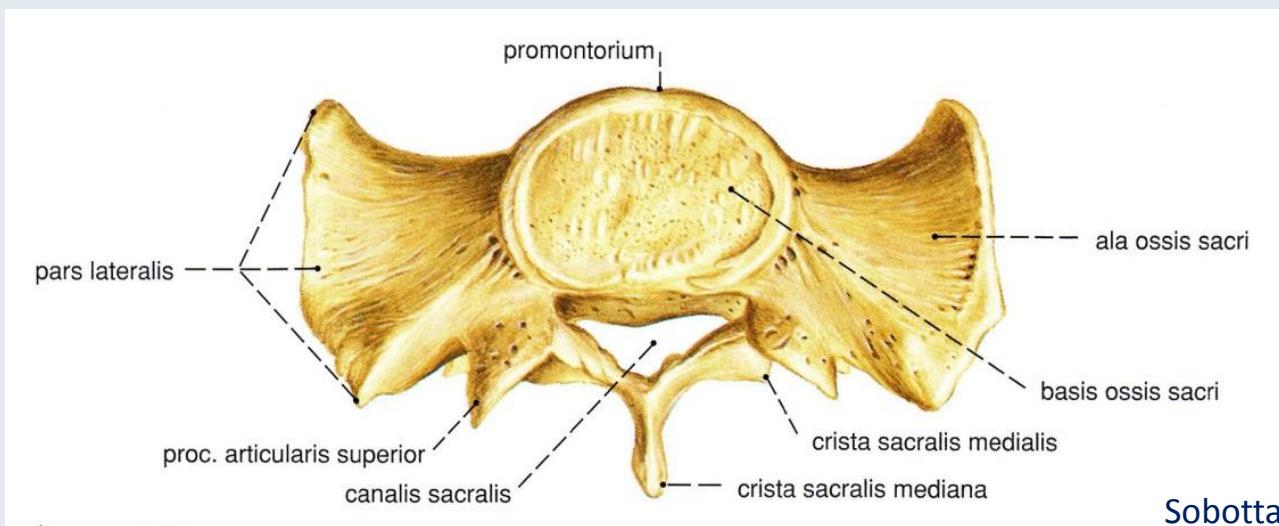


Bertos & Lluch

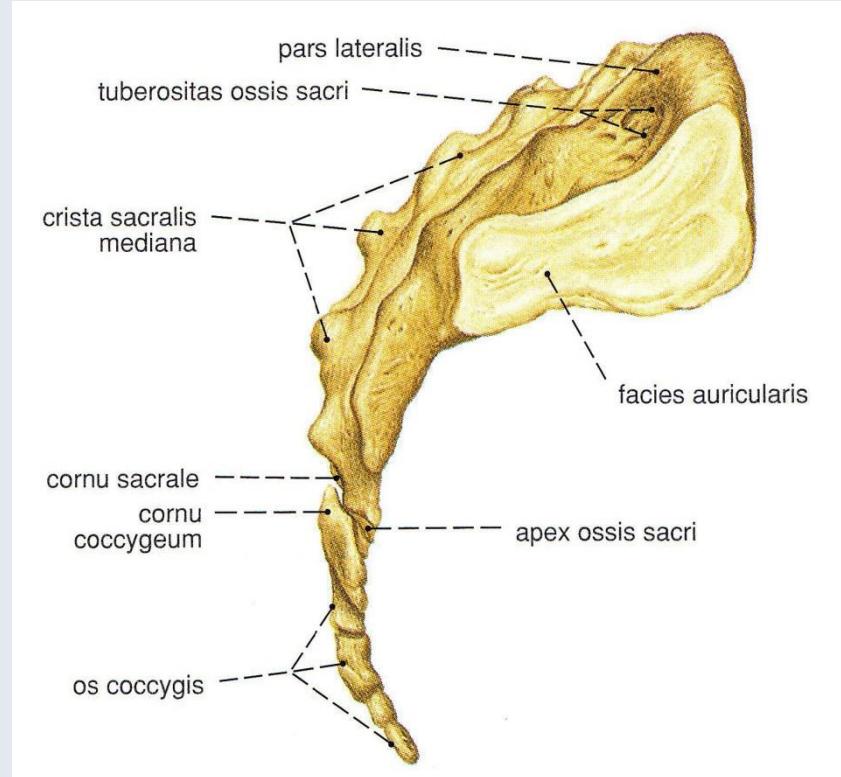


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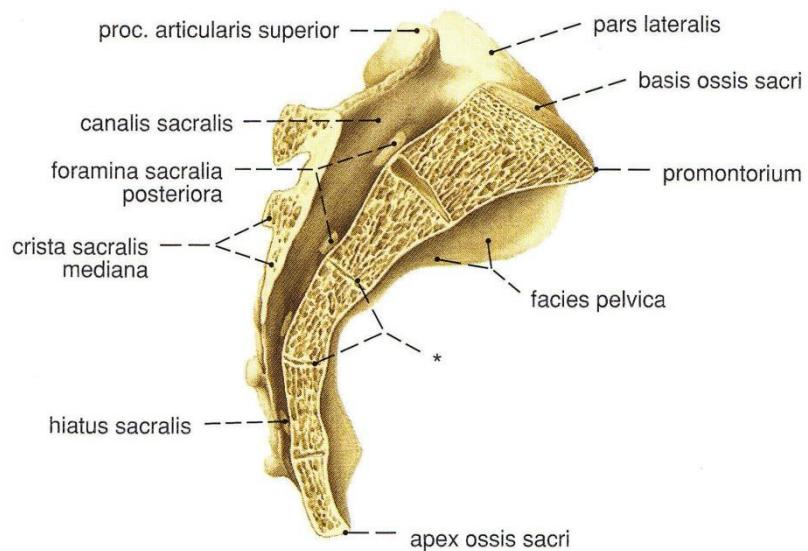


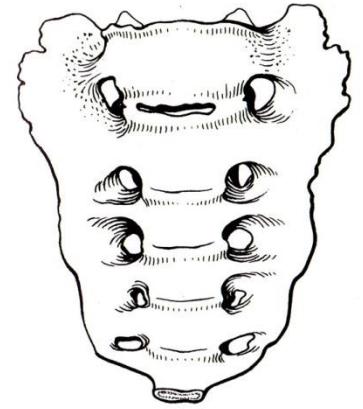


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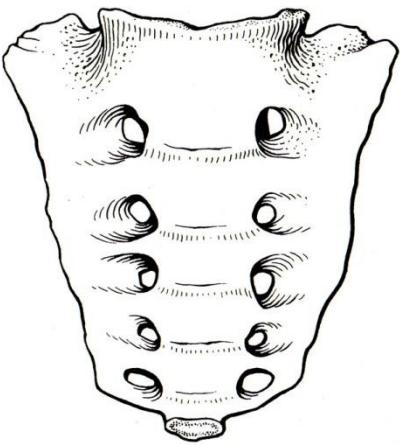


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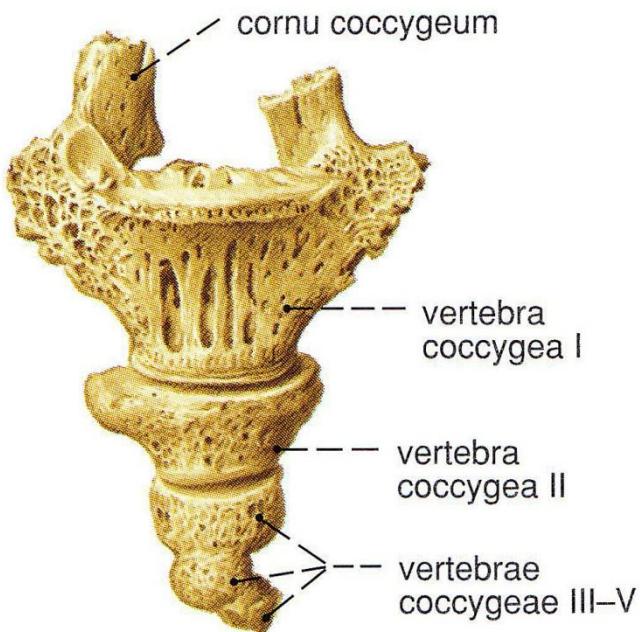
A Sakralisation des 5. Lendenwirbels



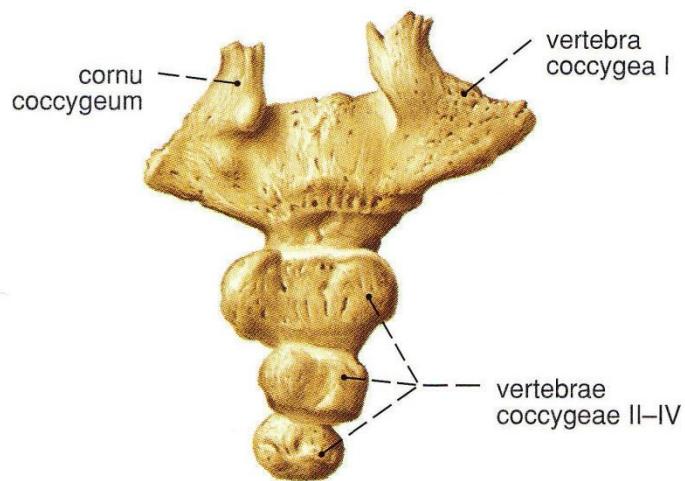
B Sakralisation des 1. Steißwirbels

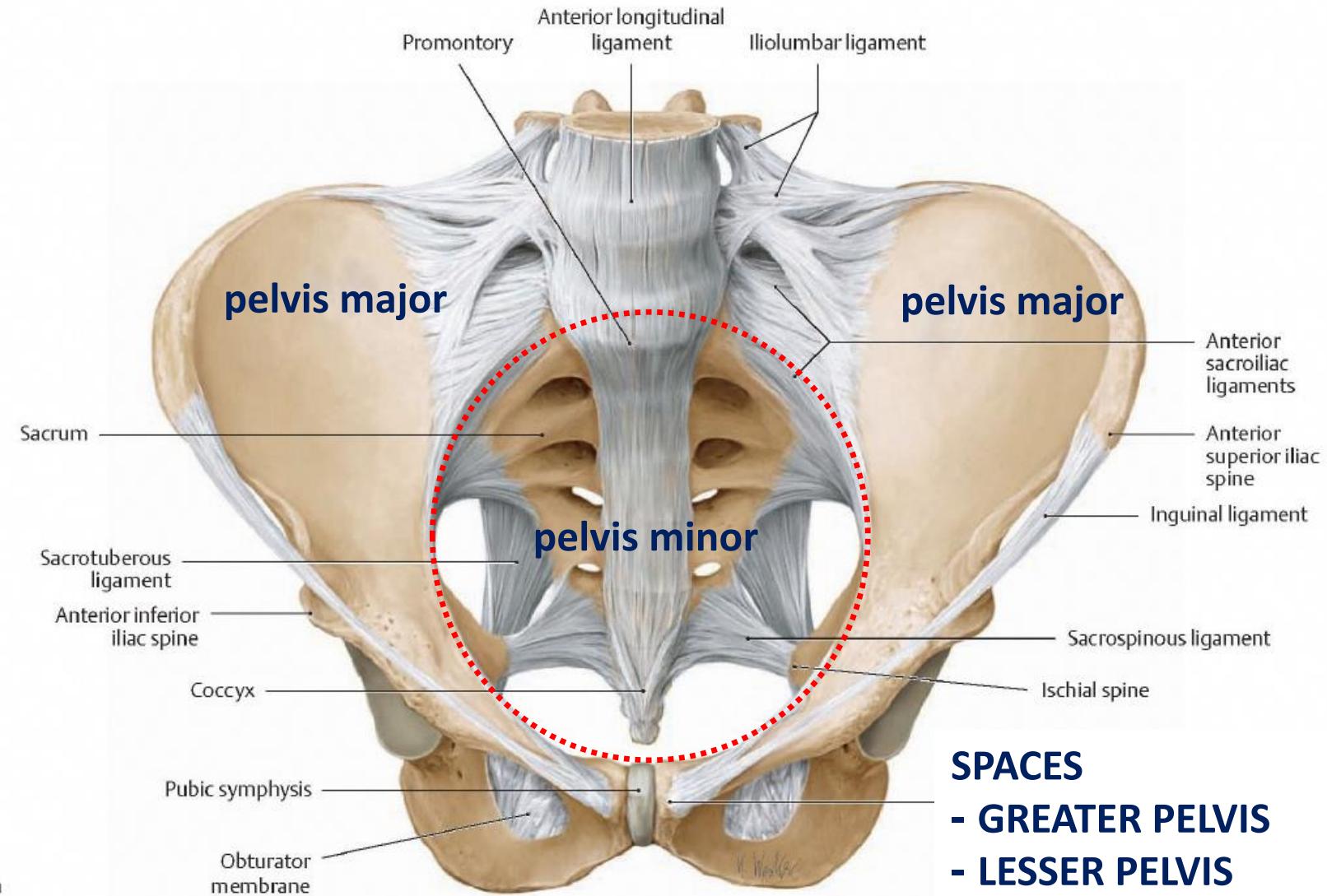
Platzer





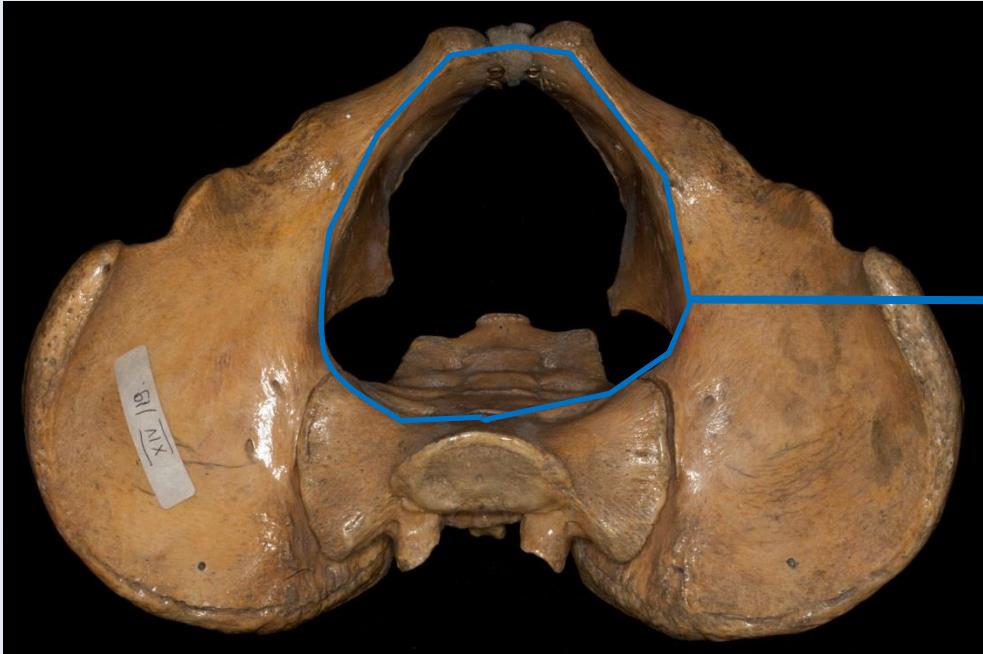
Sobotta





**SPACES**  
- GREATER PELVIS  
- LESSER PELVIS

SEPARATED BY THE:  
**LINEA TERMINALIS**

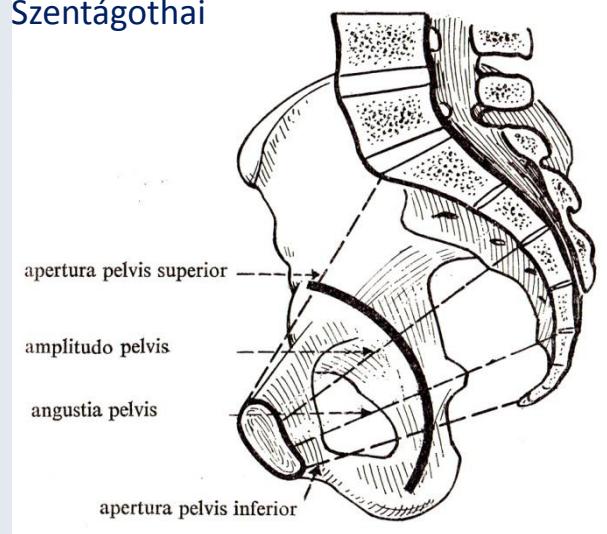


Sup. pelvic aperture:

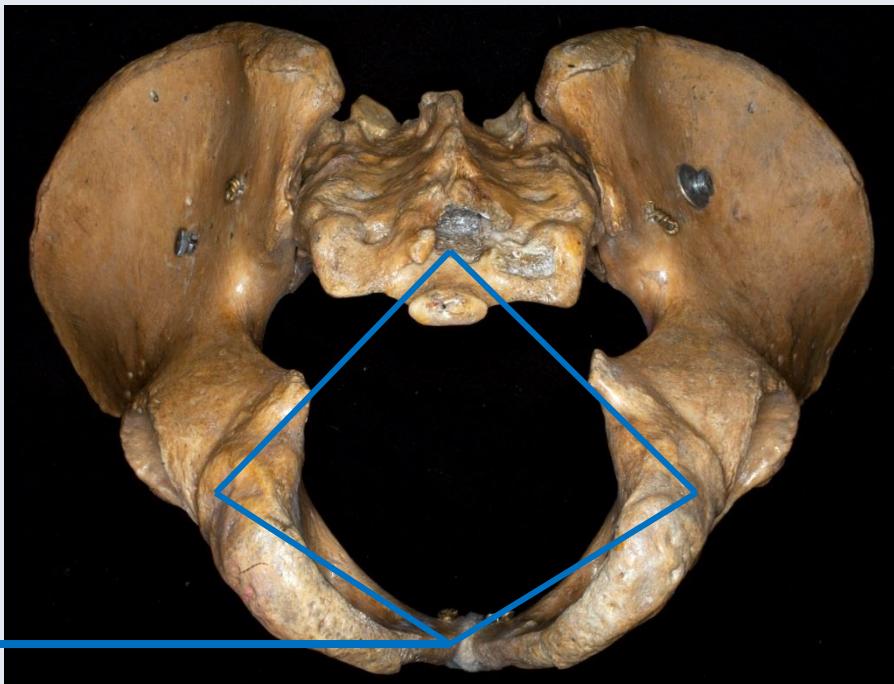
- Promontorium
- Articulatio sacroiliaca
- Partes laterales ossis sacralis
- Linea arcuata
- Eminentia iliopubica
- Pecten ossis pubis
- Symphysis

Linea terminalis

Szentágothai



Apertura pelvis inferior



# Ligaments of the pelvis

# COMPONENTS AND MOVEMENTS

- Two pelvic bones (left and right) articulating with the axial skeleton via the sacrum.
- The pelvic bones are each made up of three bones:
  - ilium
  - ischium
  - pubis
- These bones are fused by puberty to form the pelvic bone.
- The pelvic girdle can only move as a unit (L and R shoulder girdles can move independent of each other)
  - Sagittal plane
    - anterior/posterior tilt
  - Frontal plane
    - left lateral pelvic rotation: left side moves upward
    - right lateral pelvic rotation
  - Transverse plane
    - left transverse pelvic rotation: left side moves posterior
    - right transverse pelvic rotation

## THE BONY COMPONENTS:

### 1. Sacroiliac joint: os coxae + sacrum

auricular surfaces of sacrum and ilium

hyalin cart. superficialy, fibrous cart. deeply!

Capsule:

tight, dense, limited articular cavity

Ligaments:

- ventral sacroiliac ligament (weak)
- dorsal sacroiliaca ligament (strong)
- interosseal sacroliliaca ligament (strong)

### 2. Pubic symphysis

- symphysial surface of pubis and an interpubic discus

- synchondrosis, fibrocartilage

Not a true joint, however, it may contain a „cavity” within the disc

Ligaments: superior pubic lig.

(inf.!) arcuate pubic lig.

Sacroiliac ligg.

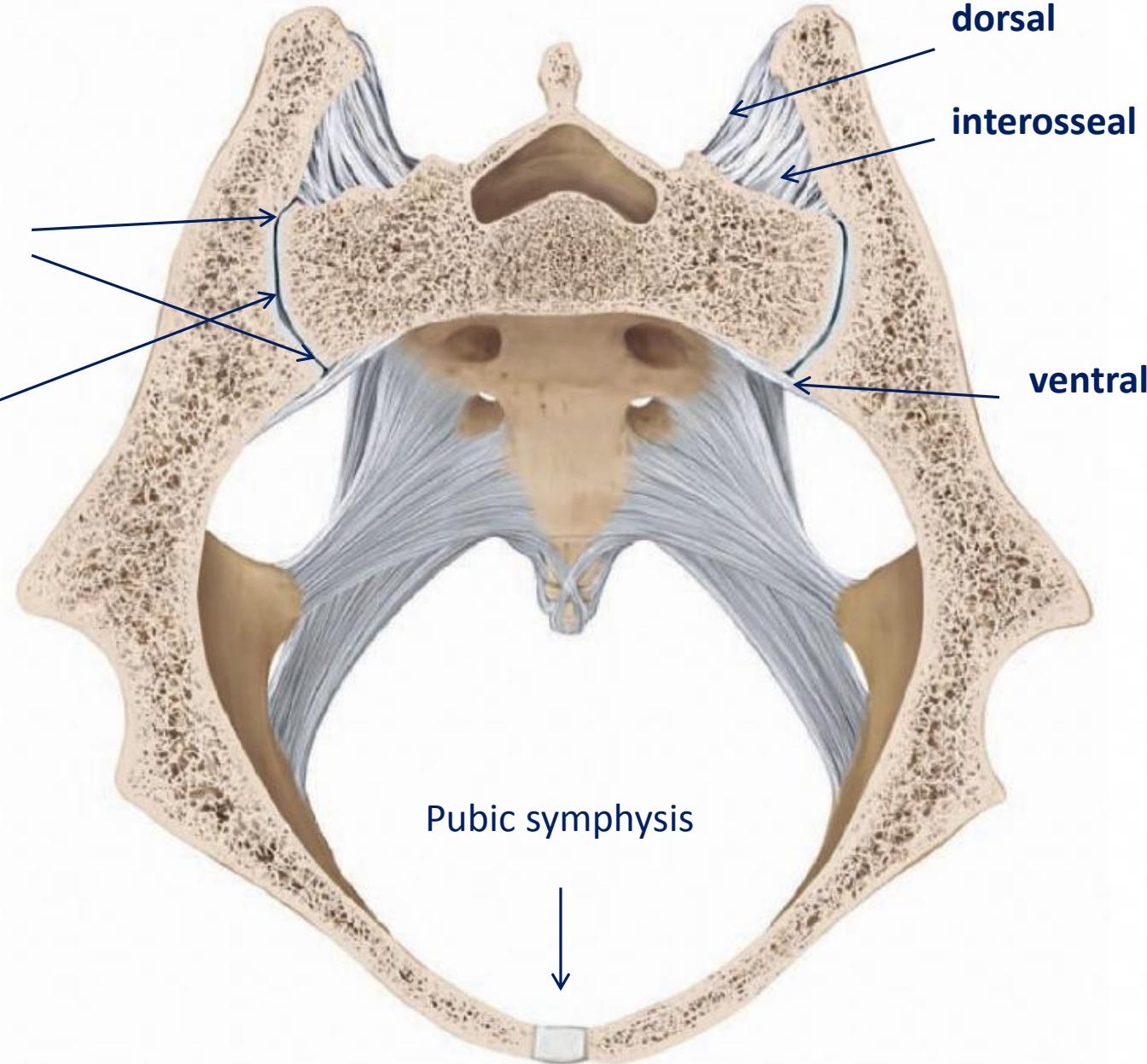
dorsal  
interosseal

Hyalin cart.

Fibrous cart.

ventral

Pubic symphysis



# SACRAL JOINTS

## LUMBOSACRAL JOINT

(synchondrosis, syndesmosis)

intervertebral disc

anterior and posterior longitudinal ligg.

ligg. flava

interspinal and supraspinal ligg.

lig. iliolumbale (stabilizes the joint)

## ZYGAPOPHYSIAL JOINT

Synovial joint between the 5th lumbar vertebra and the corresponding articular process of the sacrum

## SACROCOCCYGEAL JOINT

(HINGE JOINT?? SYNCHONDROSIS??)

*sacrococcygeal disc*

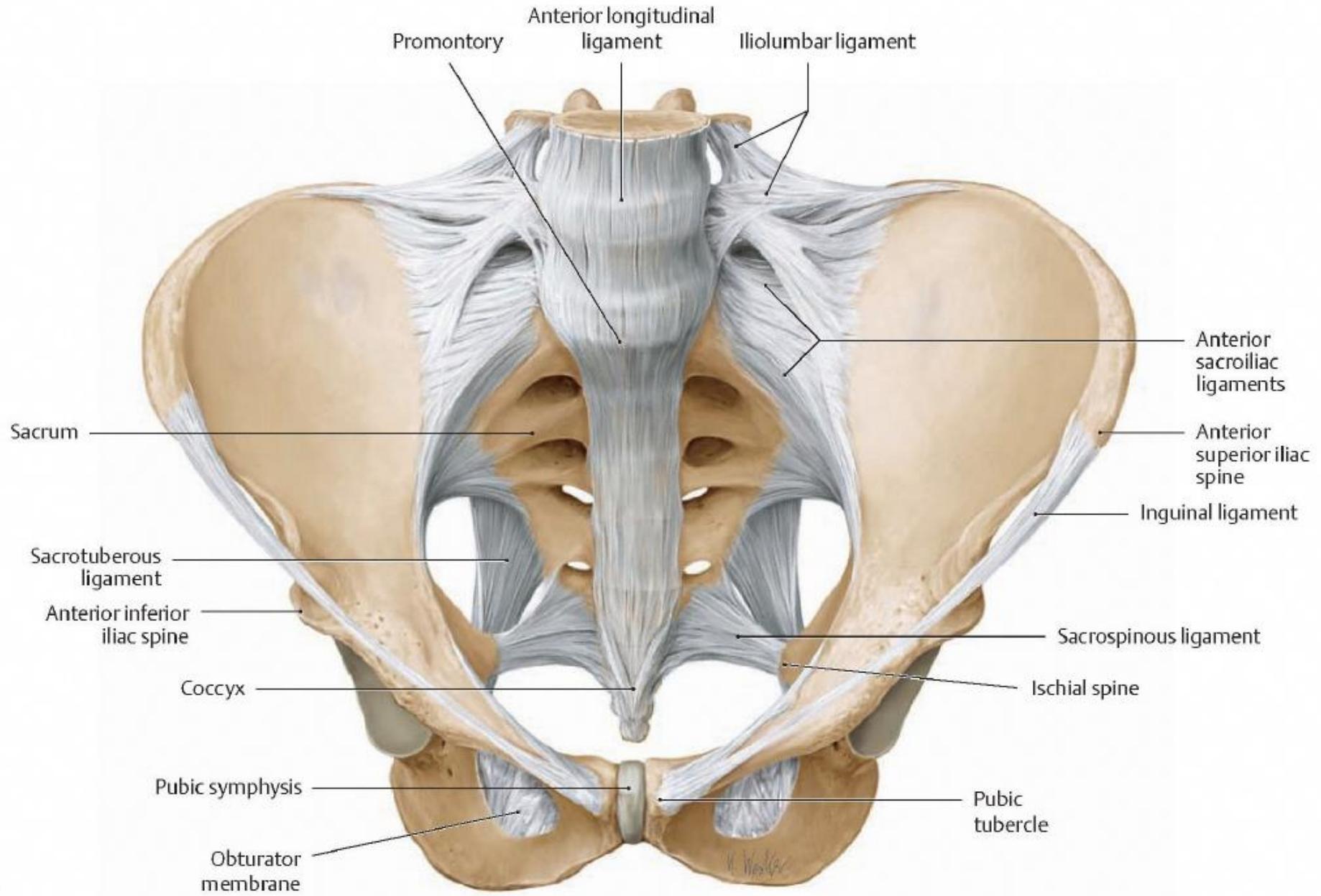
*anterior sacrococcygeal lig. (=lig. long. ant.)*

*lateral sacrococcygeal lig.*

*(lig. intercornuale)*

*post. superficial sacrococcygeal lig. (=lig. long. post.)*

*post. deep sacrococcygeal lig. (=lig. long. post.)*



a

# PELVIC LIGAMENTS

TO COMPLETE THE PELVIC CAVITY

- *sacrospinous ligament*

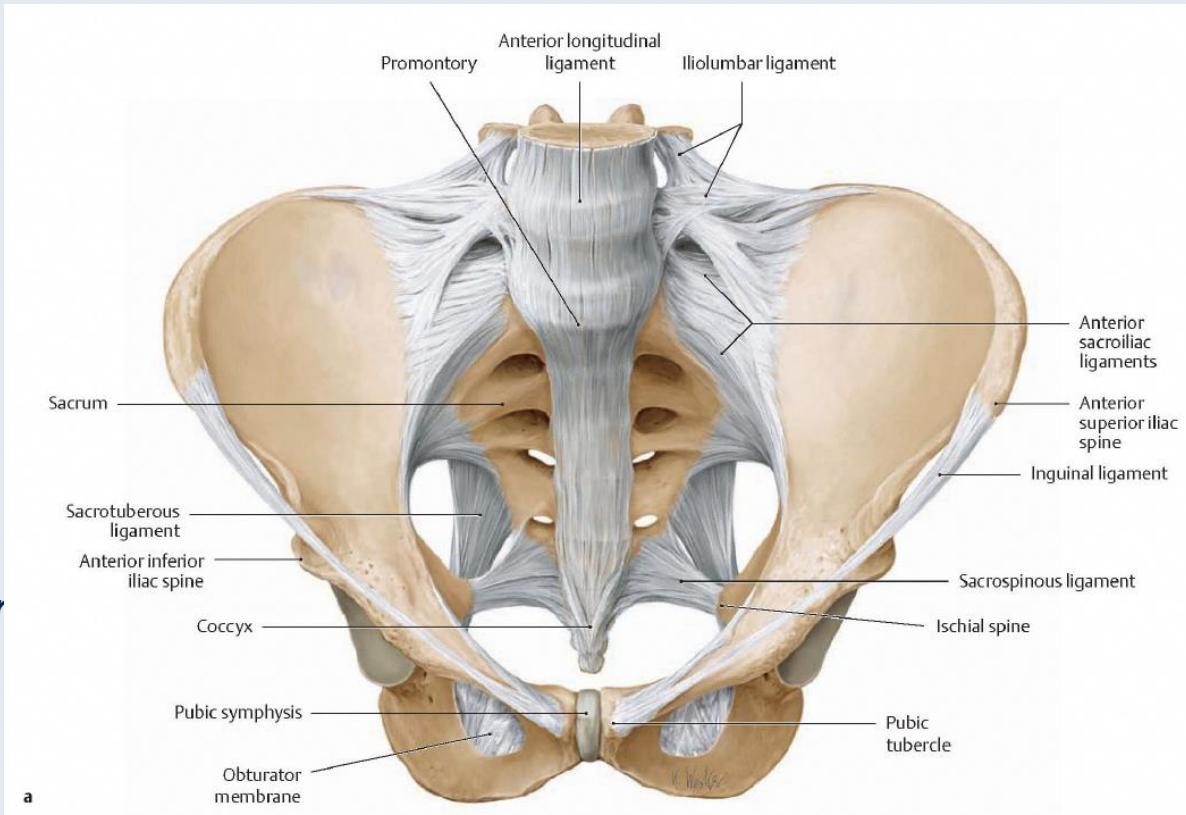
- *sacrotuberal ligament*

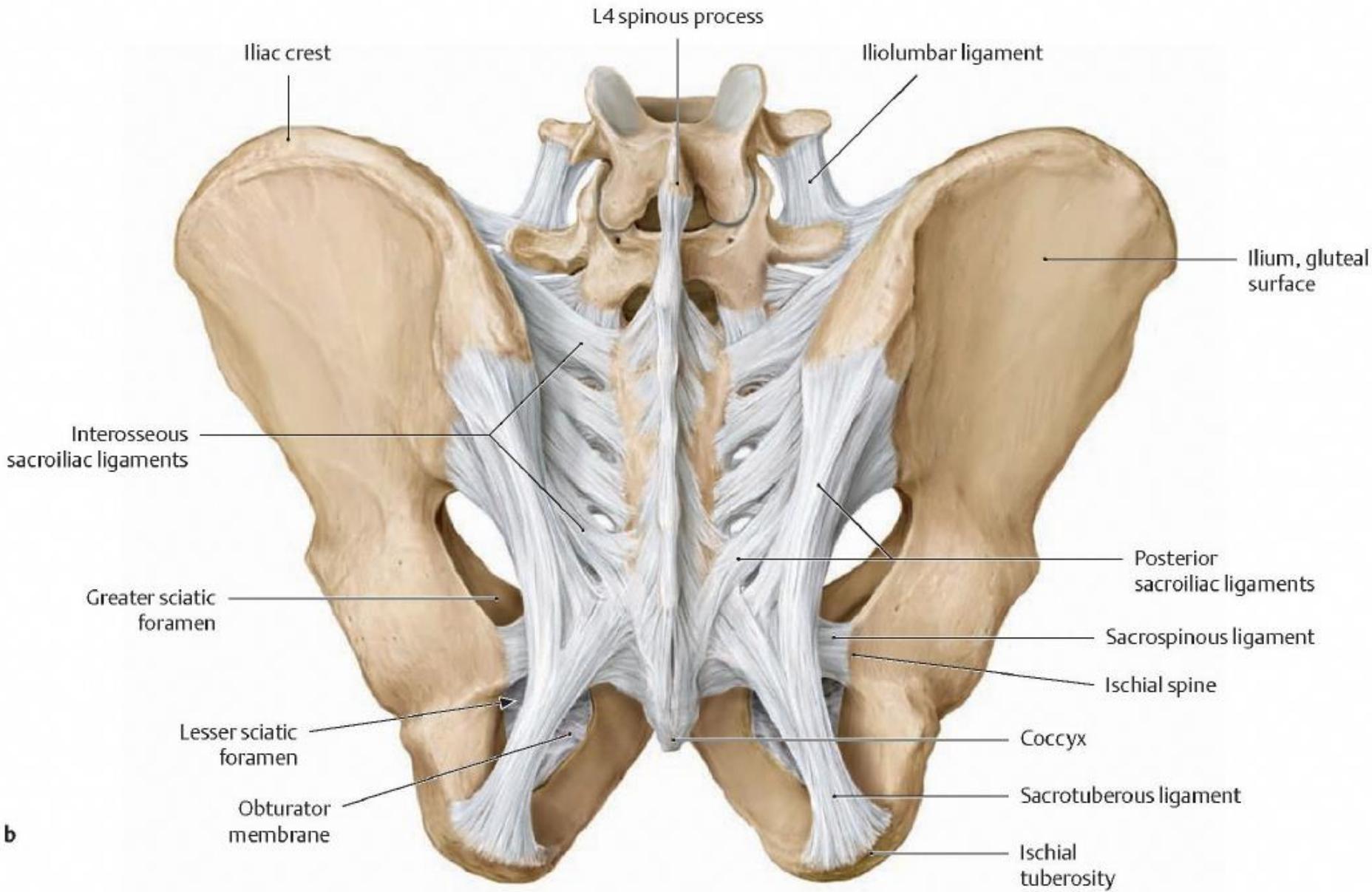
(continues as *falciform process*)

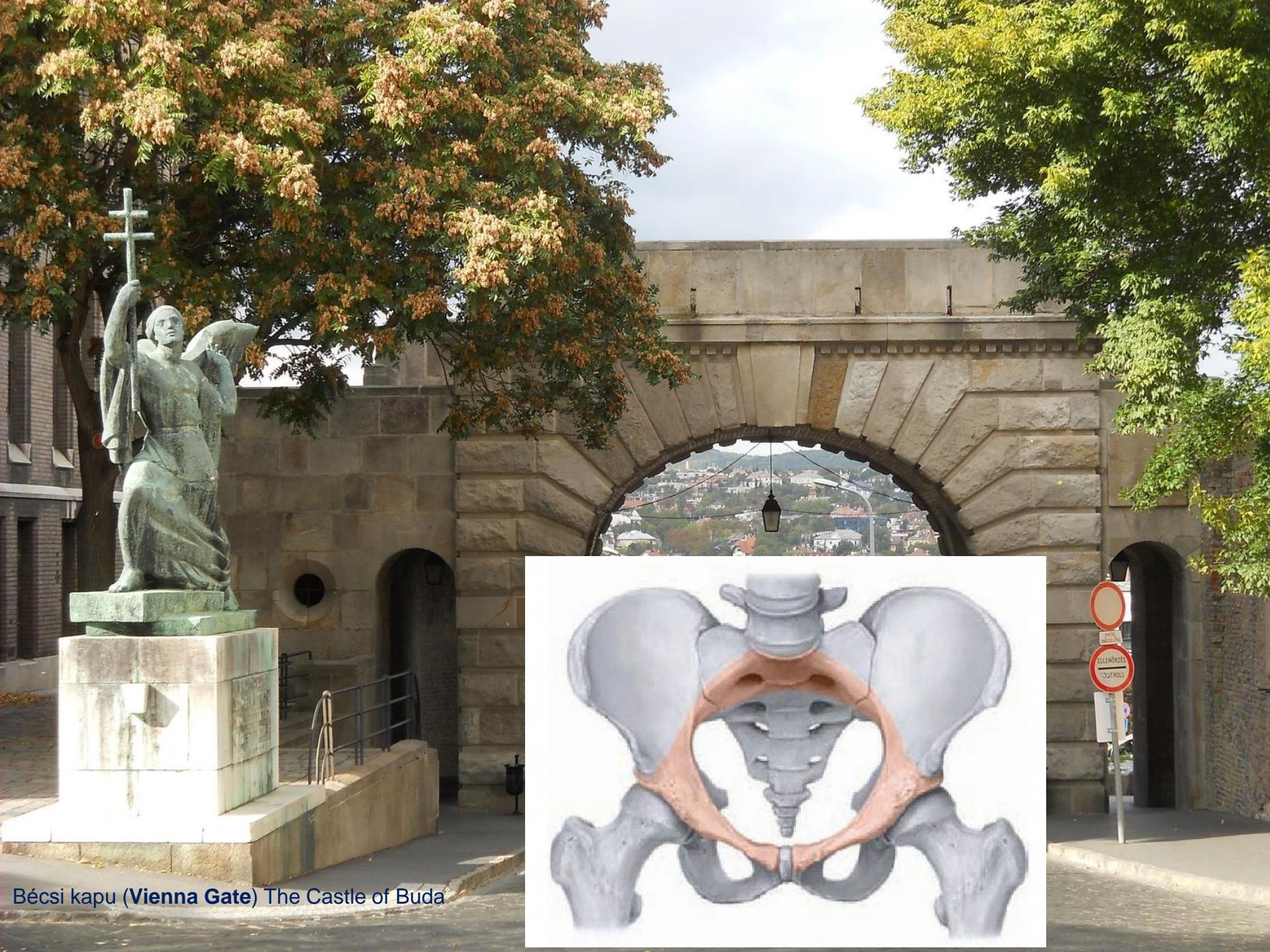
- *obturator membran*

- *inguinal ligament*

(TENDON of the external oblique abdor  
m.!!)

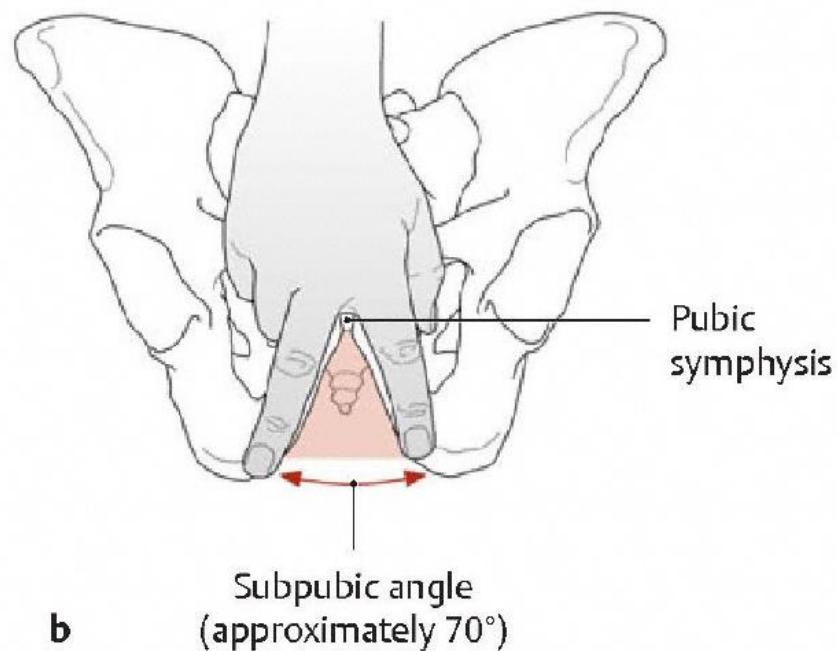
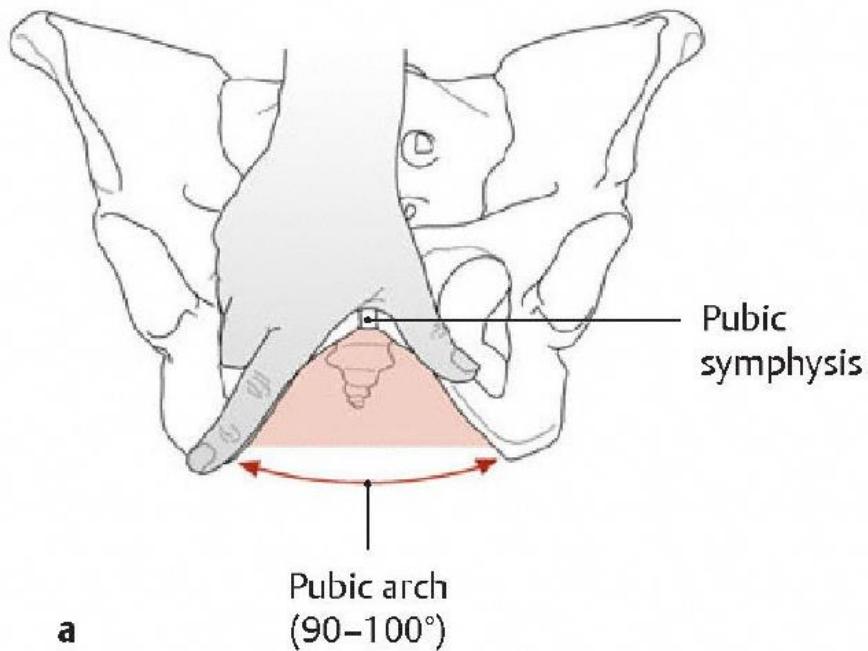






Bécsi kapu (**Vienna Gate**) The Castle of Buda

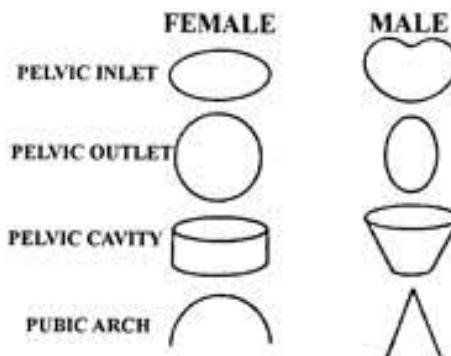
# **MALE AND FEMALE FEATURES**



## D Lower pubic angle

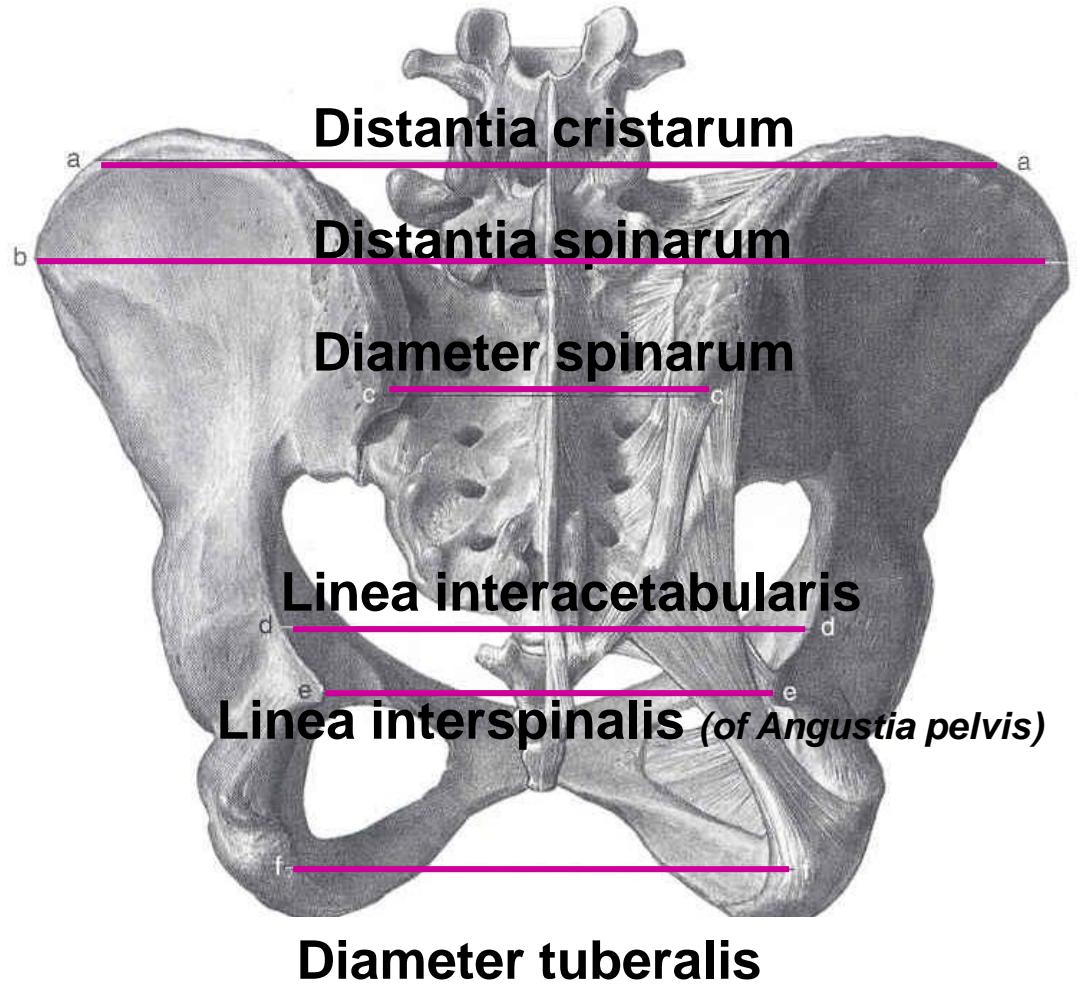
Anterior view.

- a** Female pelvis: pubic arch.
- b** Male pelvis: subpubic angle.



# DIAMETERS 1.

PELVIS FEMININA      ASPECTUS POSTERIOR



d-d=a medenceüreg harántátmérője (=interacetabularis vonal) 12—12,5 cm  
e-e=a medence legszűkebb szelvényének (angustia pelvis) harántátmérője (=interspinalis vonal) 10,5 cm  
f-f=a medence kimenet harántátmérője (=diameter tuberalis) 11—12 cm  
\*A perspektíva miatt a distantia cristarum rövidebbnek tűnik a distantia spinarumnál

# DIAMETERS 2.

## PELVIS FEMININA

## ASPECTUS MEDIALIS

k-k=axis pelvis

a-b=a klinikumban: conjugata  
(vera) anatomica

a-e=a klinikumban: conjugata  
diagonalis 12,5–13 cm

a-c=a klinikumban: conjugata  
(vera) obstetrica  
10,4–11 cm

n-d=a klinikumban:  
a medence üreg  
sagittalis átmérője  
12–12,5 cm

e-g=a medence legszükebb  
szelvényének sagittalis  
átmérője 11–11,5 cm

e-f=a medence kimenet

sagittalis átmérője  
(distantia pubococcyea)  
9–10 cm

Spina iliaca anterior superior

Spina iliaca anterior inferior

**(DIAMETER) CONJUGATA DIAGONALIS**

**(DIAMETER) CONJUGATA  
VERA ANATOMICA**

**Apertura pelvis superior**

**INCLINATIO PELVIS**

**(DIAMETER) CONJUGATA  
VERA OBSTETRICA**

Foramen obturatum

**DIAMETER SAGITTALIS (amplitudo pelvis)**

Foramen ischiadicum [sciaticum] majus

Lig. sacrospinale

**ANGUSTIA PELVIS  
(distantia pubococcyea)**

Lig. sacrotuberale

Foramen ischiadicum [sciaticum] minus

**APERTURA PELVIS INFERIOR  
AXIS PELVIS**

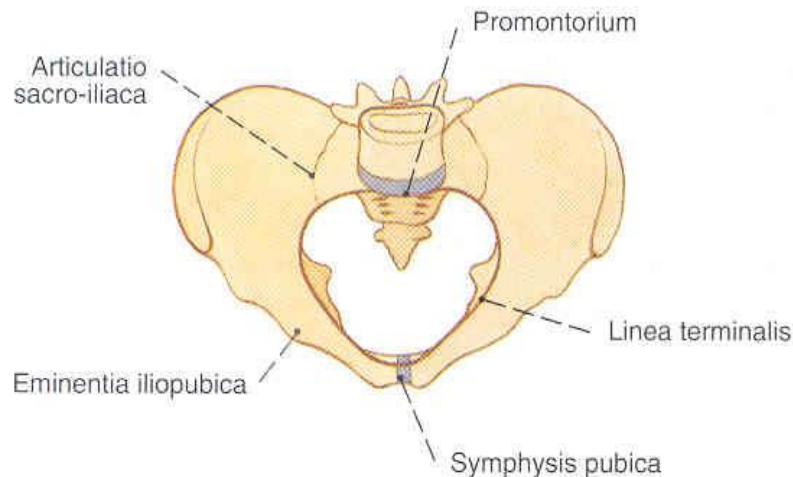
Tuber ischiadicum

1140. ábra A női medence átmérőinek bemutatása,  
median metszés  
medial felől (jobb oldal).

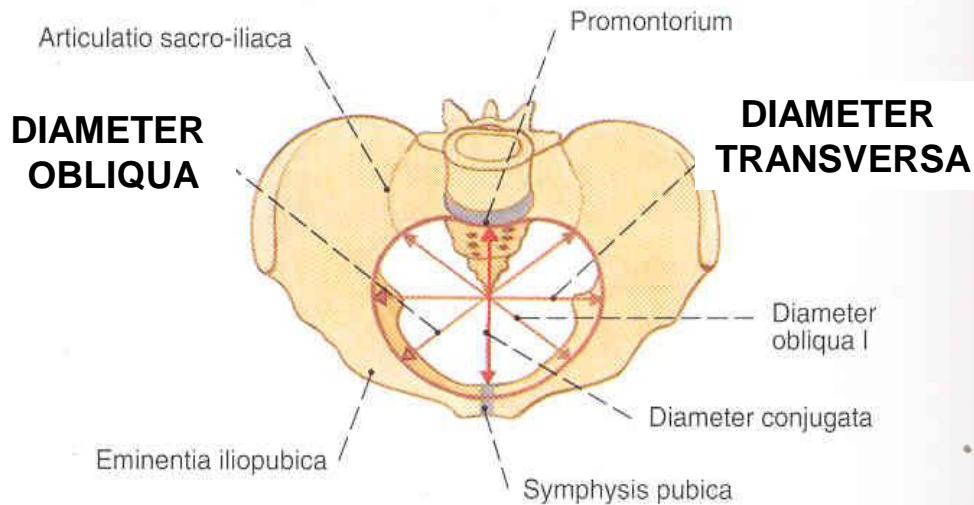
\* Az apertura pelvis superior a linea terminalis határolja. Az a-c vonal adja a medence bemenetének síkját. A farokcsont csúcsa, az ülőcsont gumója, az ülőcsont szára és a szeméremcsont alsó szára határolják az apertura pelvis inferiort

# DIAMETERS 3.

## MALES



## FEMALES



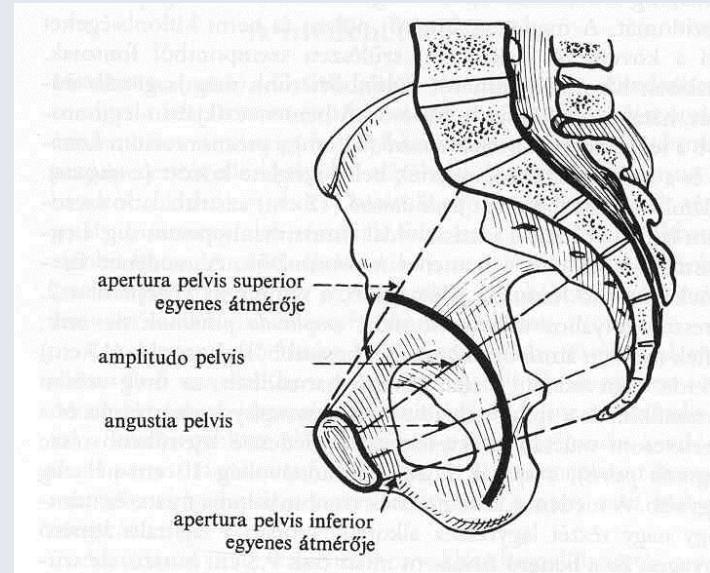
## MOST IMPORTANT MEASUREMENTS

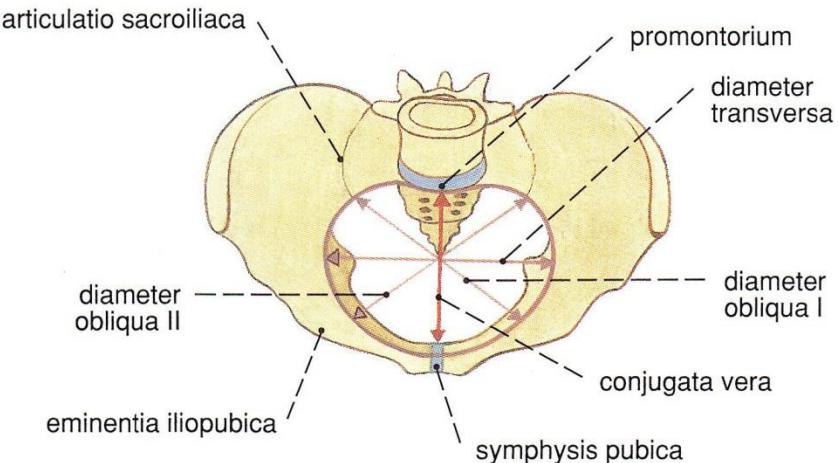
diameter conjugata (anatomica)

amplitudo pelvis

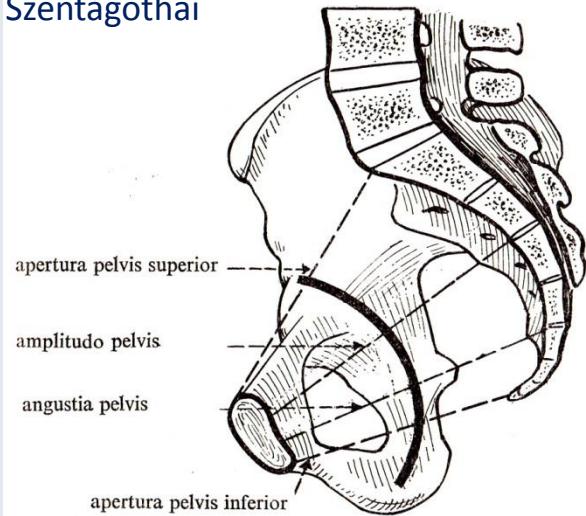
distantia pubococygea

angustia pelvis

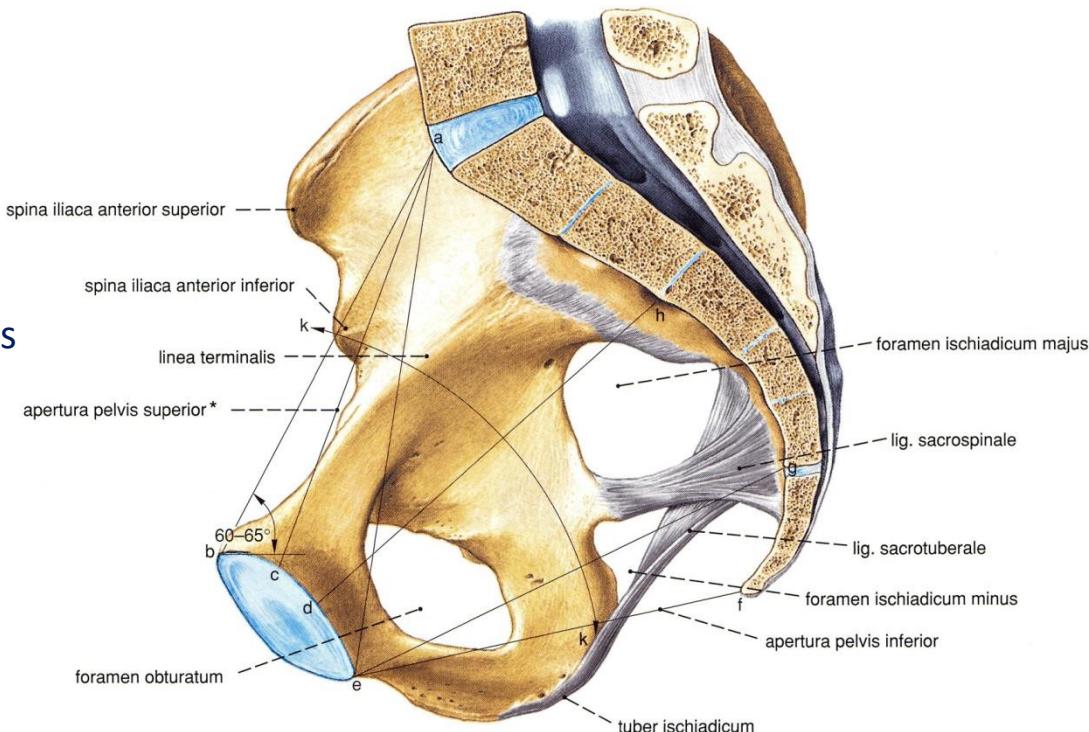




Szentágothai



Sobotta



## Pelvic diameter:

Diameter transversa ~ 13,5 cm

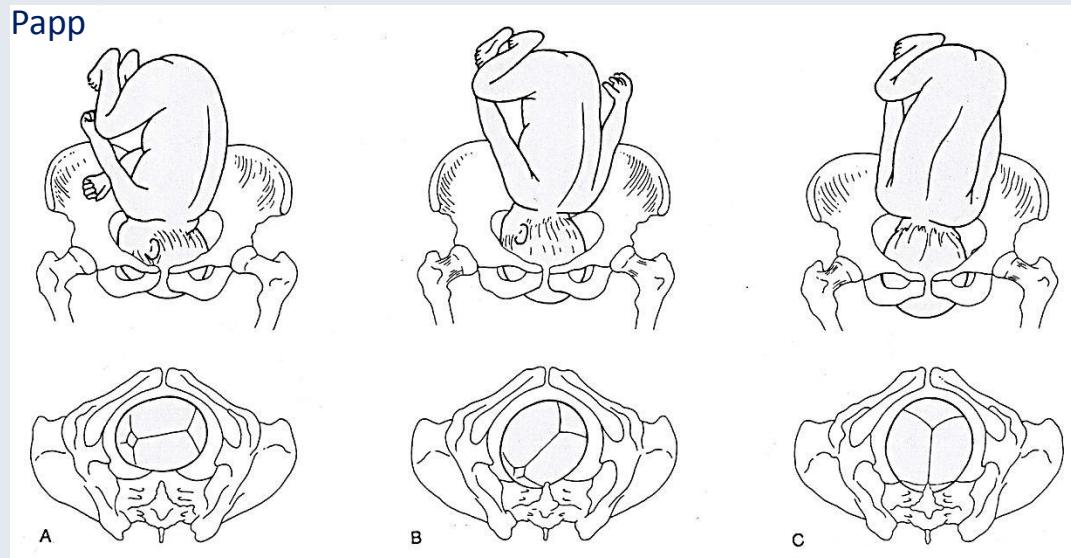
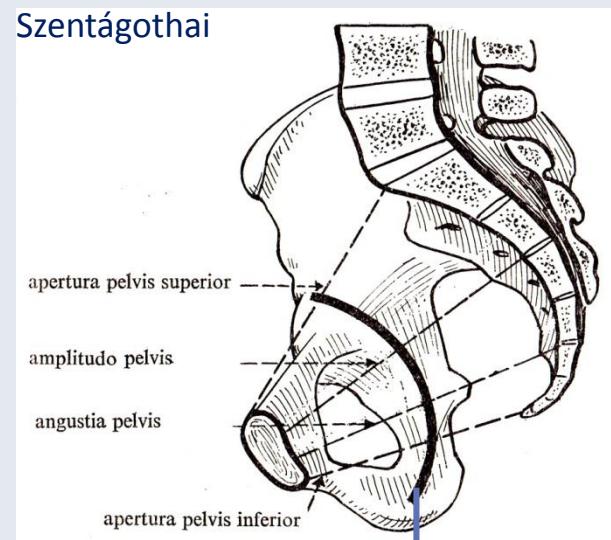
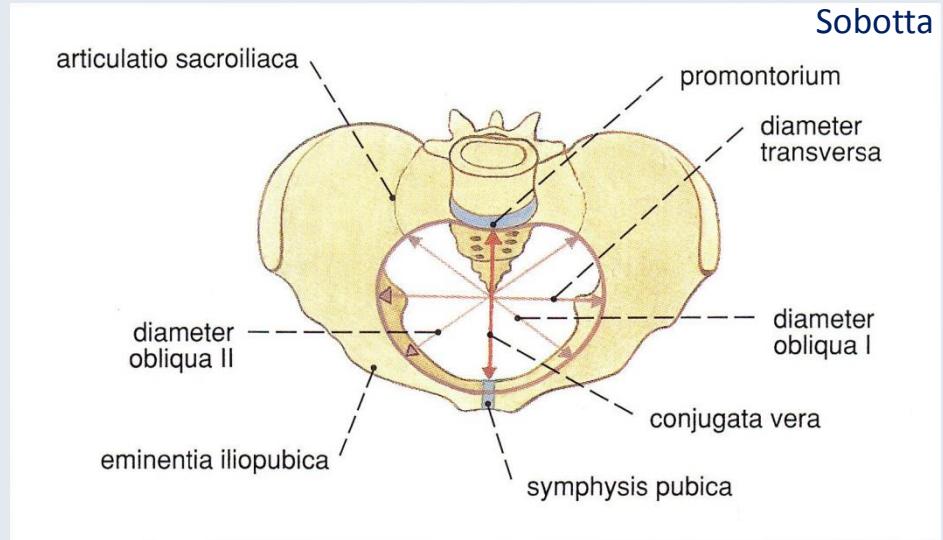
Conjugata vera /obstetrica/ ~ 11 cm

(plane of the suo. Pelvis aperture; a-c)

Amplitudo pelvis (plane at the level of  
2. Sacral vertebra and the middle of simphisis  
max. diameter ~ 13 cm

Angustia pelvis (e-g) ~ 11,5 cm

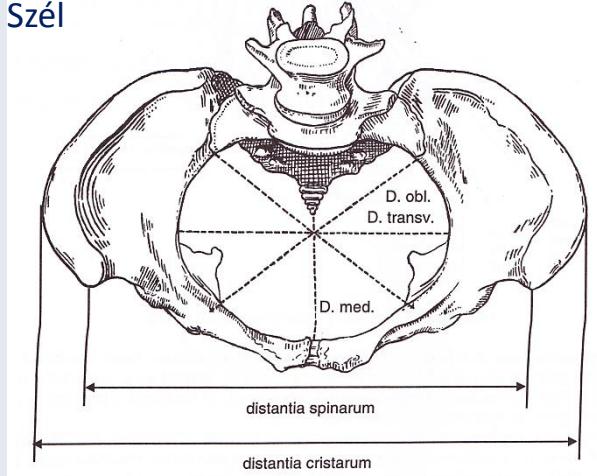
Distantia pubococygea (e-f) ~ 9,5 cm



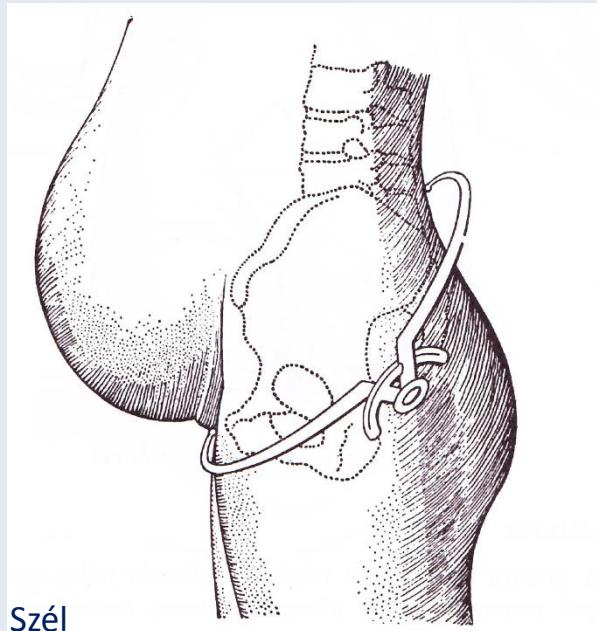
[www.baby-guru.hu](http://www.baby-guru.hu)

The head of the infant moves along the Axis pelvis, with the largest Diameter of the head (frontosuboccipital) the respective largest bowl diameter turns.

Szél



Assessment of the pelvic size with the help from outer bony landmarks



Szél

Conjugata diagonalis externa  
measured with a caliper

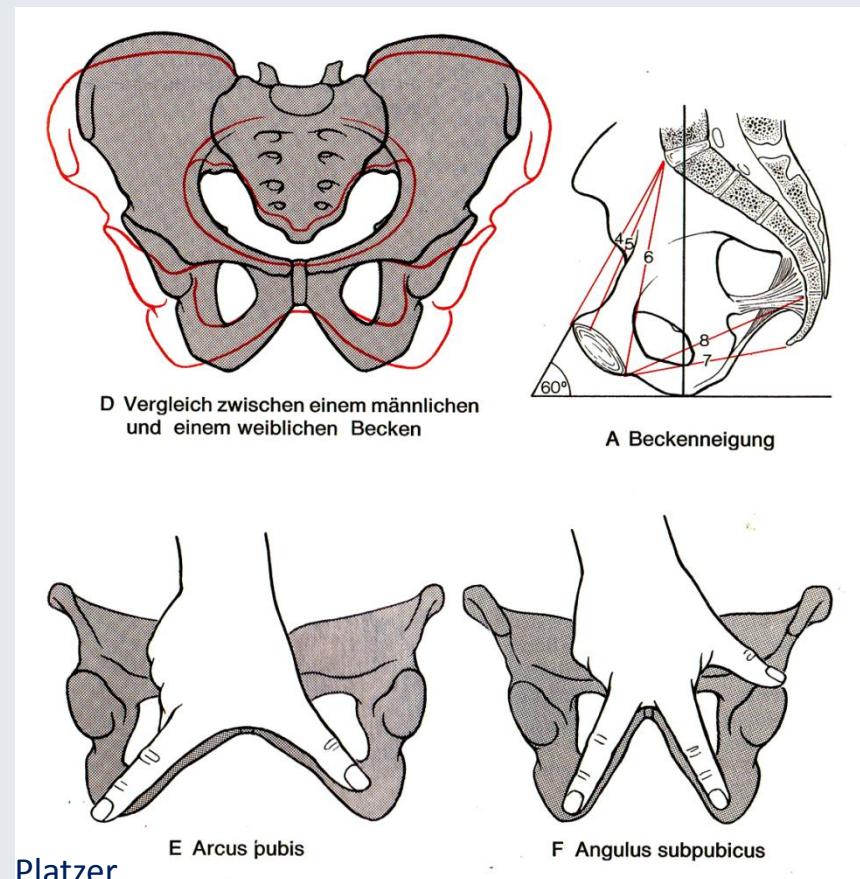
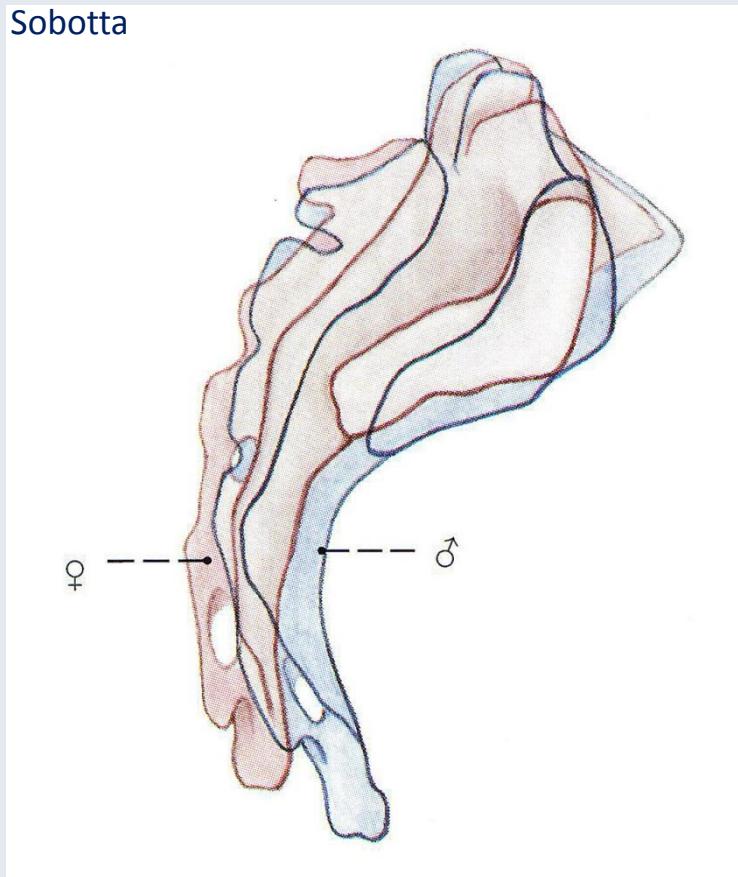


The dimples of **Venus**

Rhombus of Michaelis: between spinous process of the 5. Lumbar vertebrae, the spinae iliaceae posteriores sup. and the last coccyx

# Sex differences

Sobotta



Platzer

Braus: Anatomie des Menschen (Verlag von Julius Springer 1929.)

Papp Z.: Nőgyógyászat (Semmelweis kiadó 1999.)

Platzer W: Taschenatlas der Anatomie – Bewegungsapparat (Thieme 1991.)

Sobotta: Az ember anatómiájának atlasza (Alliter 2004.)

Szél: Klinikai anatómia (SOTE Képzéskutató 1999.)

Szentágóthai – Réthelyi: Funkcionális anatómia 1. kötet (Medicina könyvkiadó 1971.)

Bertos J, Lluch JM. Rehabilitación de sectores posteriores mandibulares atróficos. Revisión de la literatura. Rev Oper Dent Endod 2007;5:70

Sharma et al. DOI: 10.4103/2231-0746.95316

PMID: 23483067

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