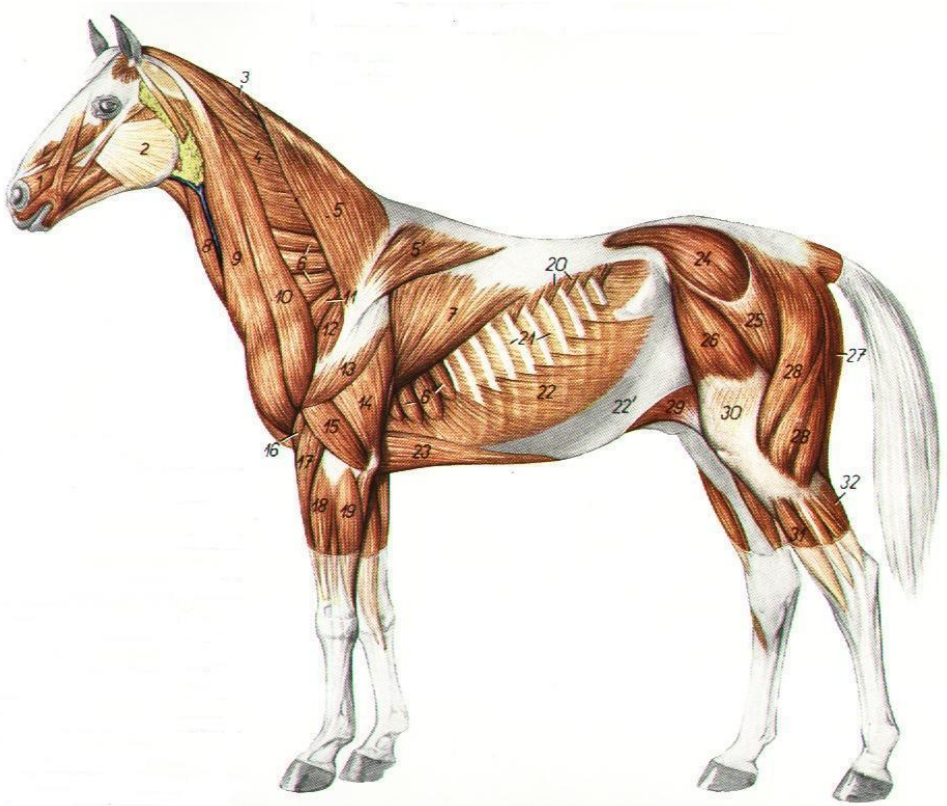


Special Arthorology

For Each Joint

* Type
* Articular surfaces
* Joint capsule
* Ligaments
* Movement
* Muscles acting

1- SHOULDER JOINT (Humeral articulation)

* Type:

Simple, Ball and socket joint.

* Movement:

Shoulder joint move all types of movement (Ball & socket).

* Articular surfaces:

1- Glenoid cavity of the scapula.
2- Head of the humerus.

* Joint capsule:

Is large so allow the bones to be drawn apart for 2-3 cm. the fibrous part of the capsule is strengthened to form two diverging elastic glenohumeral ligaments which extend from the supraglenoid tubercle to the tuberosities of the humerus.

•Ligaments:

No ligaments for the shoulder joint and the surrounding muscles play the role of ligaments in fixing the joint. These muscles are:

Cranially (extensors):

Supraspinatus - Biceps brachii

Caudally (flexors):

Triceps brachii - Detloideus

Teres major - Teres minor

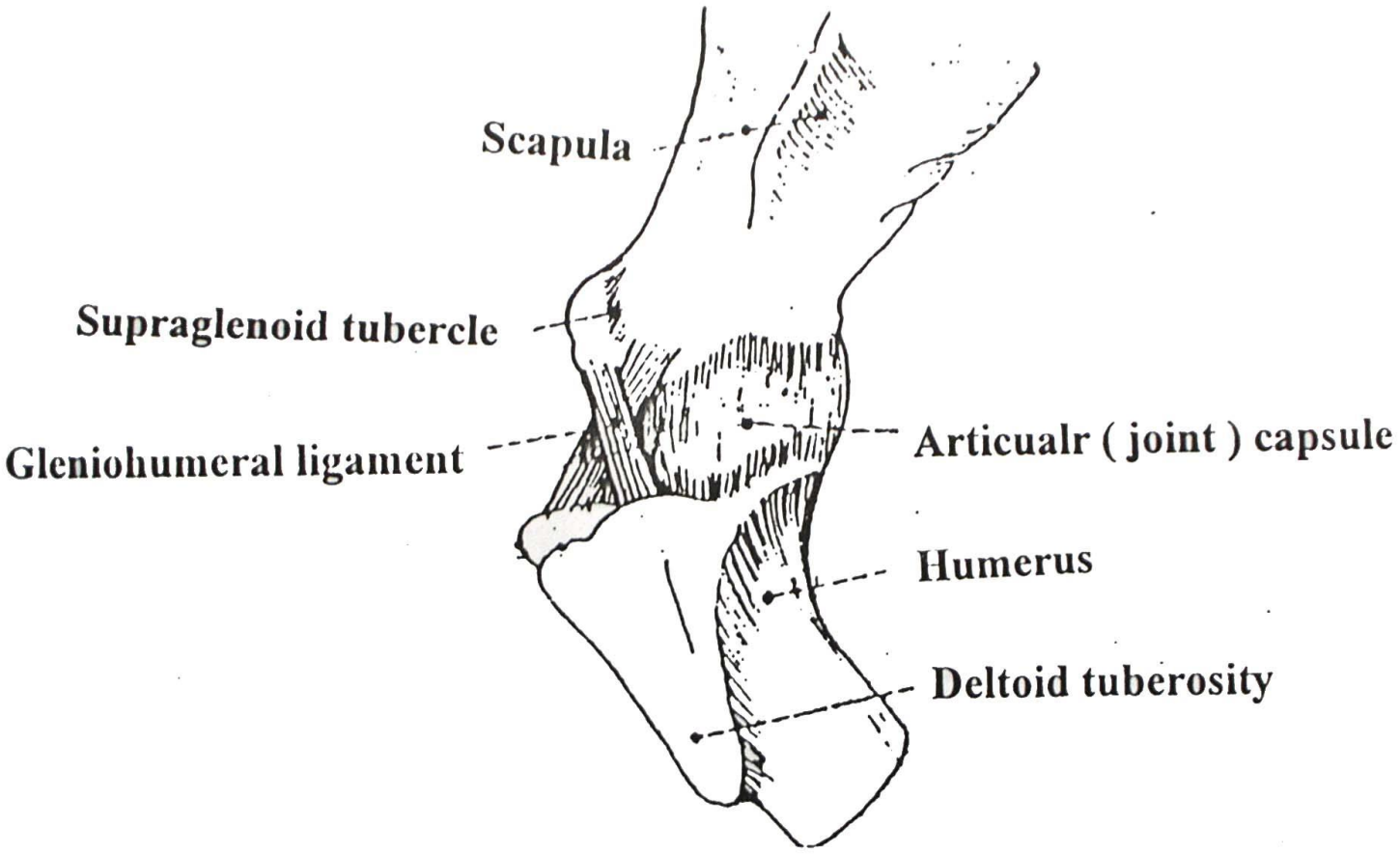
Laterally (abduction):

Infraspinatus

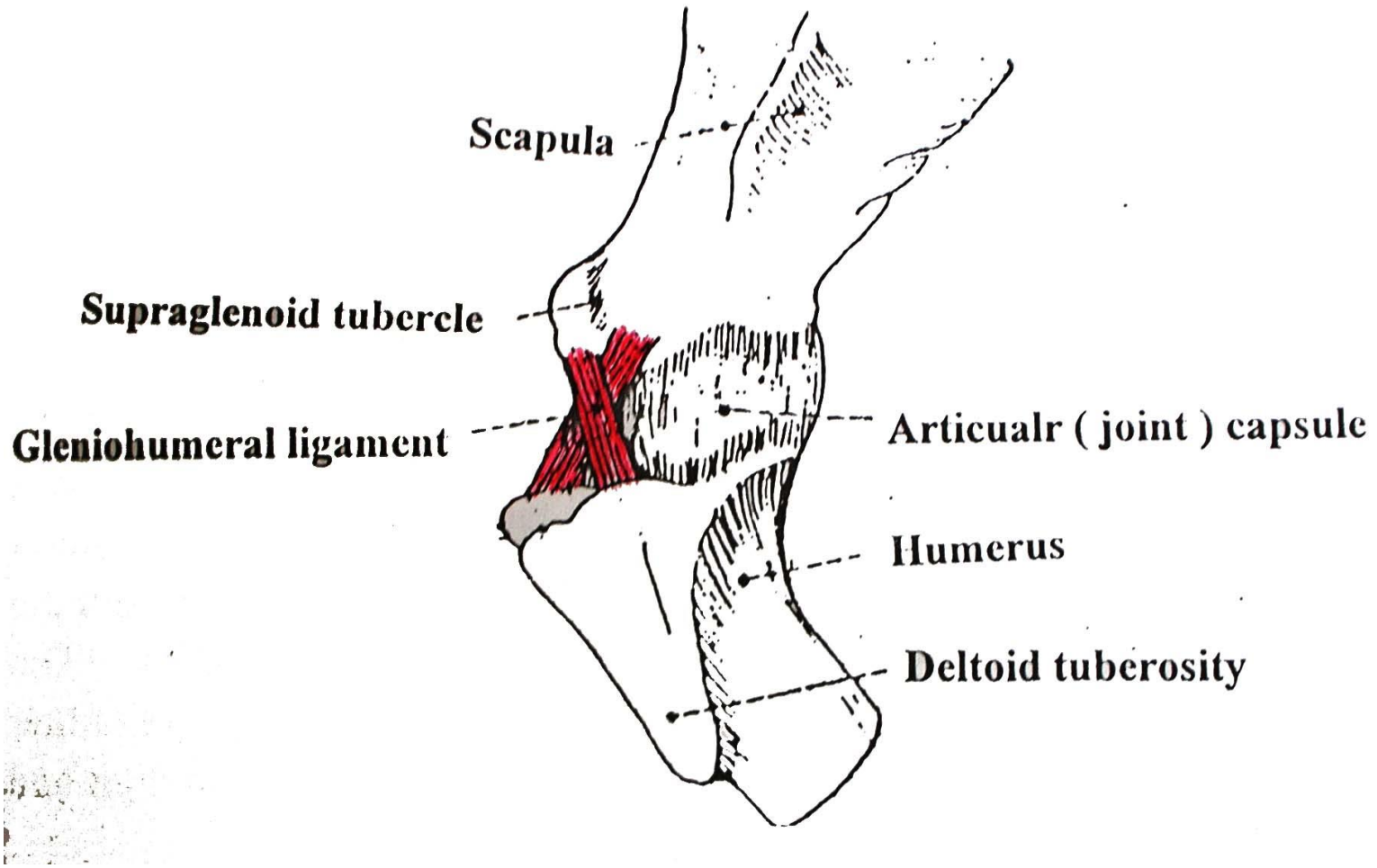
Medially (adduction):

Subscapularis - Pectoralis – Coracobrachialis

The shoulder (humeral) joint.



The shoulder (humeral) joint.



2- ELBOW JOINT (CUBITAL ARTICULATION)

* Type:

compound, hing joint.

* Movement:

flexion and extension only .

* Articular surfaces:

-Two condyles of the distal extremity of the humerus.

-Two glenoid cavities and ridge of the radius.

-Semilunar (Trochlear) notch of ulna.

* Articular capsule:

Thin caudally forming a pocket in the olecronon fossa.

It strengthed cranially to form membranous lig.

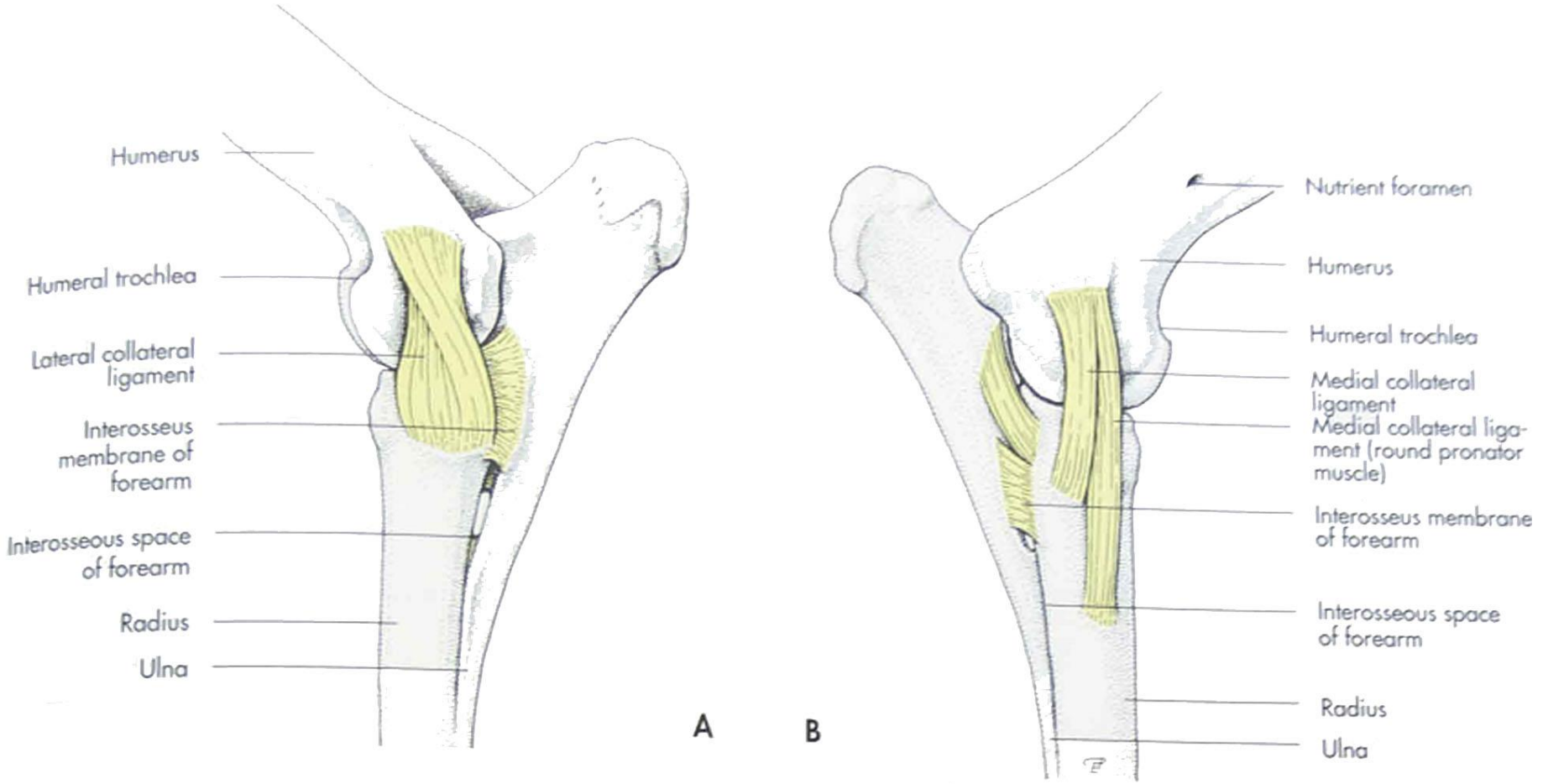


Fig. 3-39. Left elbow joint of the horse (schematic, **A** lateral and **B** medial aspect)

•ligament:

Two collateral ligaments.

1- lateral collateral lig

Consists of two divergent; superficial and deep parts.

2- medial collateral lig

Consists of long superficial and short deep part.

* Muscles acting:

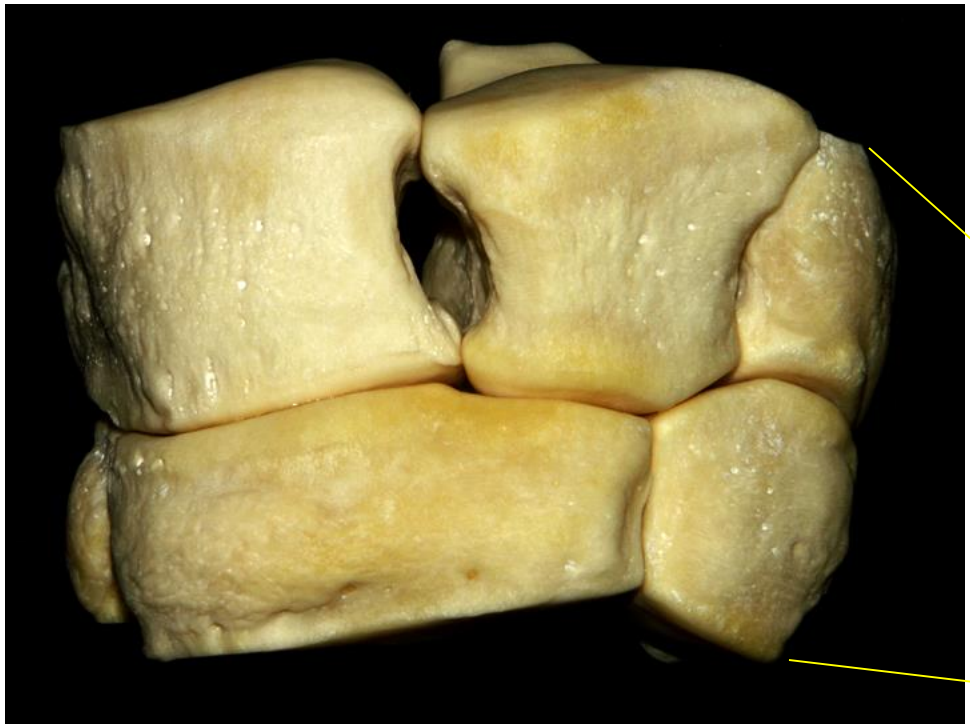
Extensor:

Triceps brachii- Anconeus- Tensor fascia antibrachii

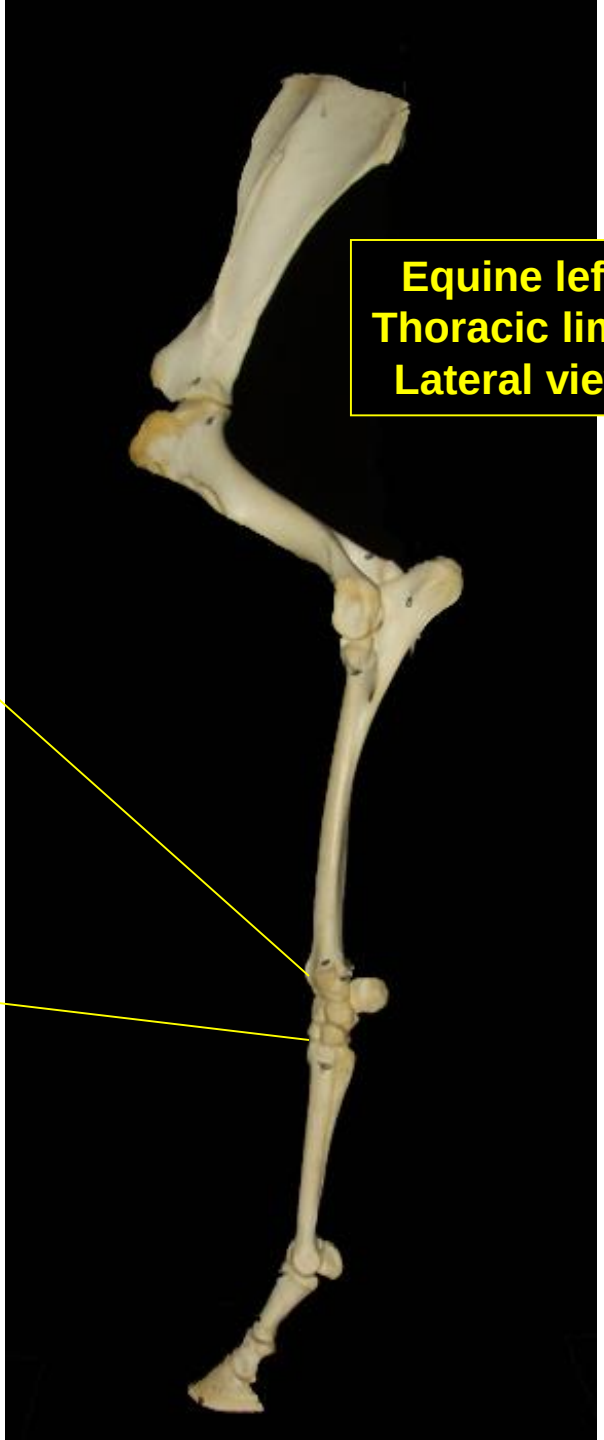
Flexors:

Biceps brachii, Brachialis

Carpal Joint



Equine left carpus, cranial view



Equine left Thoracic limb, Lateral view

3- CARPAL JOINT (Knee)

*** Type:** compound, hing joint.

*** Movement:** flexion & extension.

*** Articular surfaces:** It consists of 3 joints

-radiocarpal joint
-intercarpal joint
-carpometacarpal joint

proximal raw:

Radial (R) - intermediate (I)- Ulnar (U) - accessory (A)
Carpal bones

Distal raw:

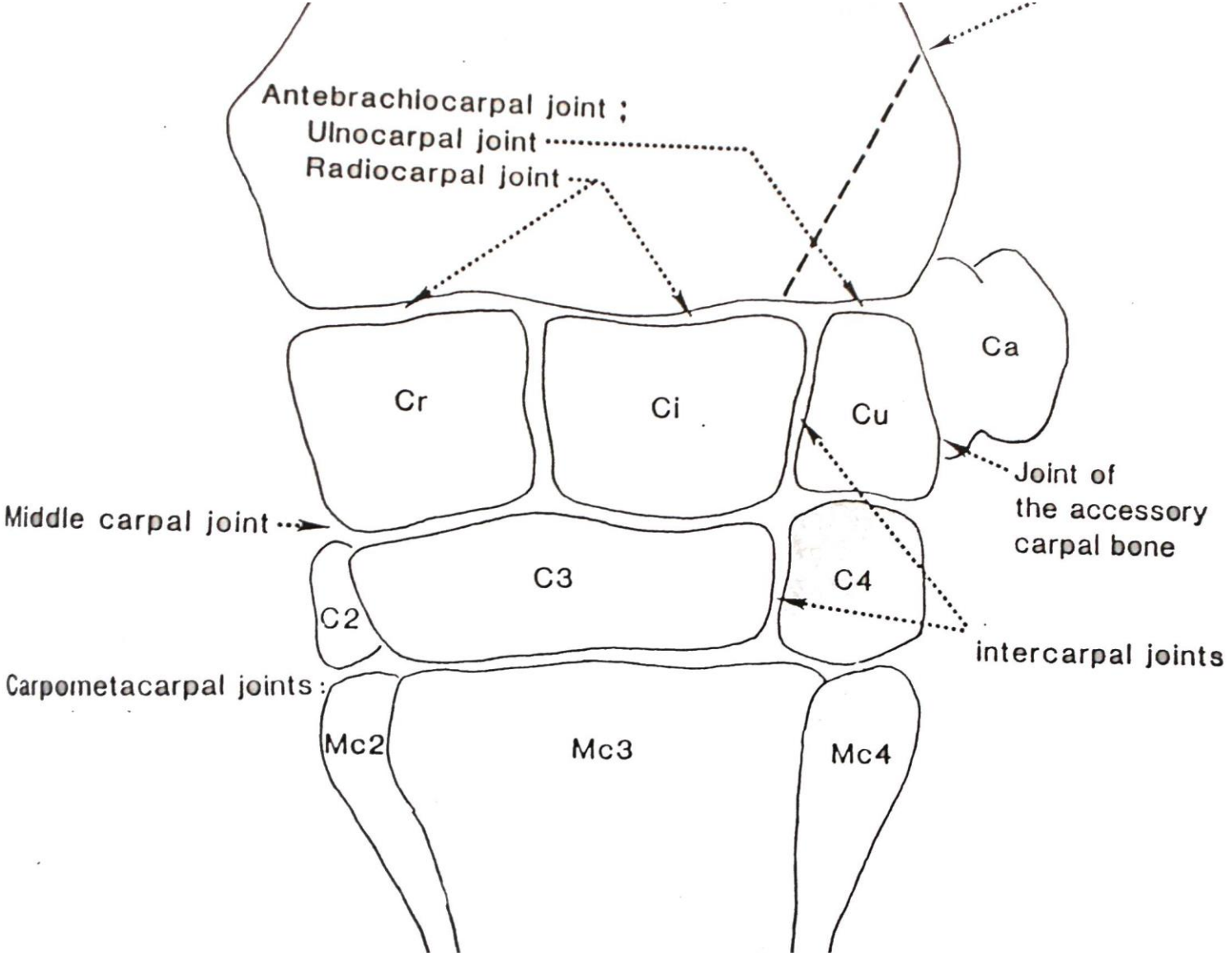
1st & 2nd, 3rd and 4th carpal bones.

•Articular capsule:

The outer fibrous layer form common sheath for the 3 joints while the synovial membrane forms 3 sacs corresponding to the 3 joints: radio carpal, intercarpal, carpo metacarpal sacs.

* Ligaments:

1-Lateral collateral lig
2-Medial collateral lig.
3-Dorsal intercarpal lig
4-Carpometacarpal lig
5-Ligaments of the accessory carpal bone.
A-Accessorio radioulnar.
B-Accessorio carpoulnar.
C-Accessorio quartal(c4).
D-Accessorio metacarpal.


Antebrachiocarpal joint ;
Ulnocarpal joint
Radiocarpal joint
Cr
Ci
Cu
Ca
Joint of
the accessory
carpal bone
Middle carpal joint
C2
C3
C4
intercarpal joints
Carpometacarpal joints :
Mc2
Mc3
Mc4

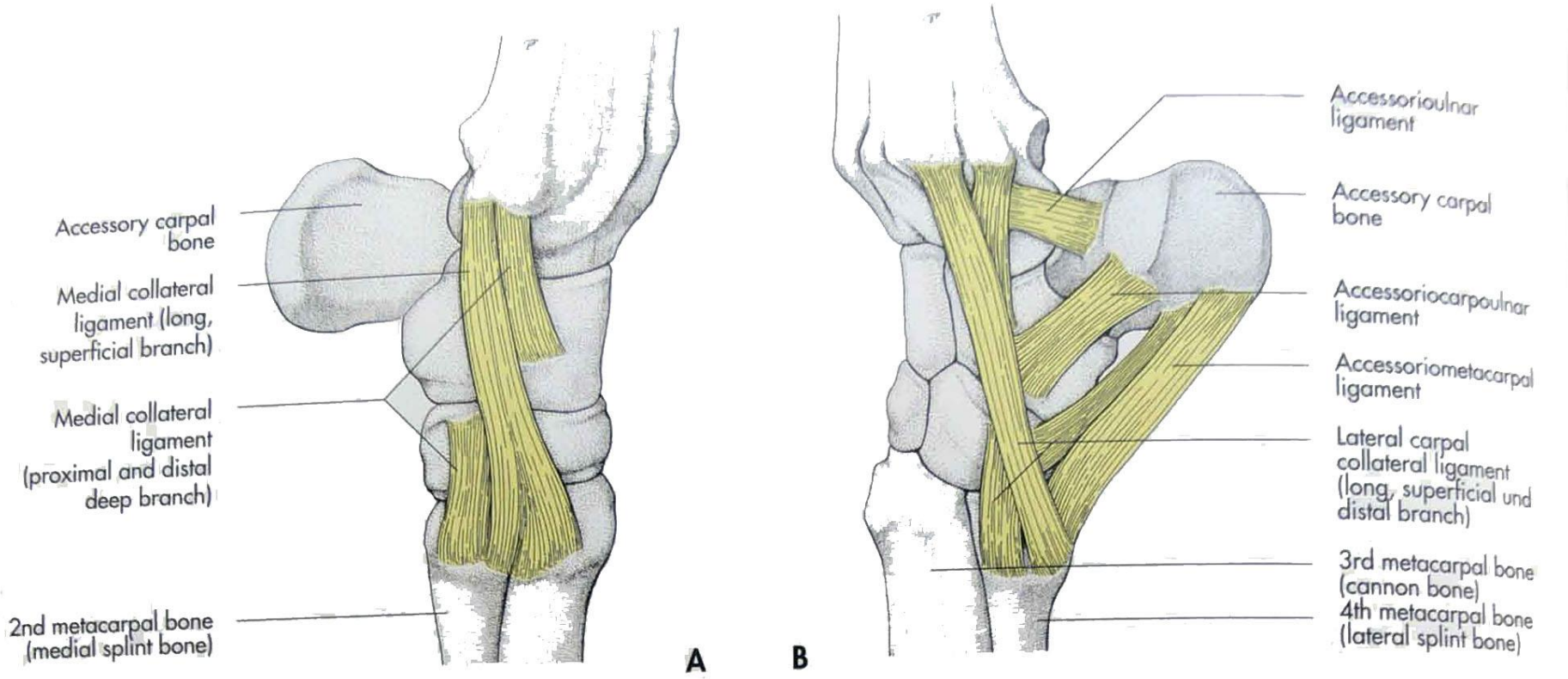


Fig. 3-42. Long collateral ligaments and ligaments of the accessory carpal bone of the left carpus of the horse (schematic, **A** medial and **B** lateral aspect) (courtesy of Dr. Susanne Wagner, Vienna).

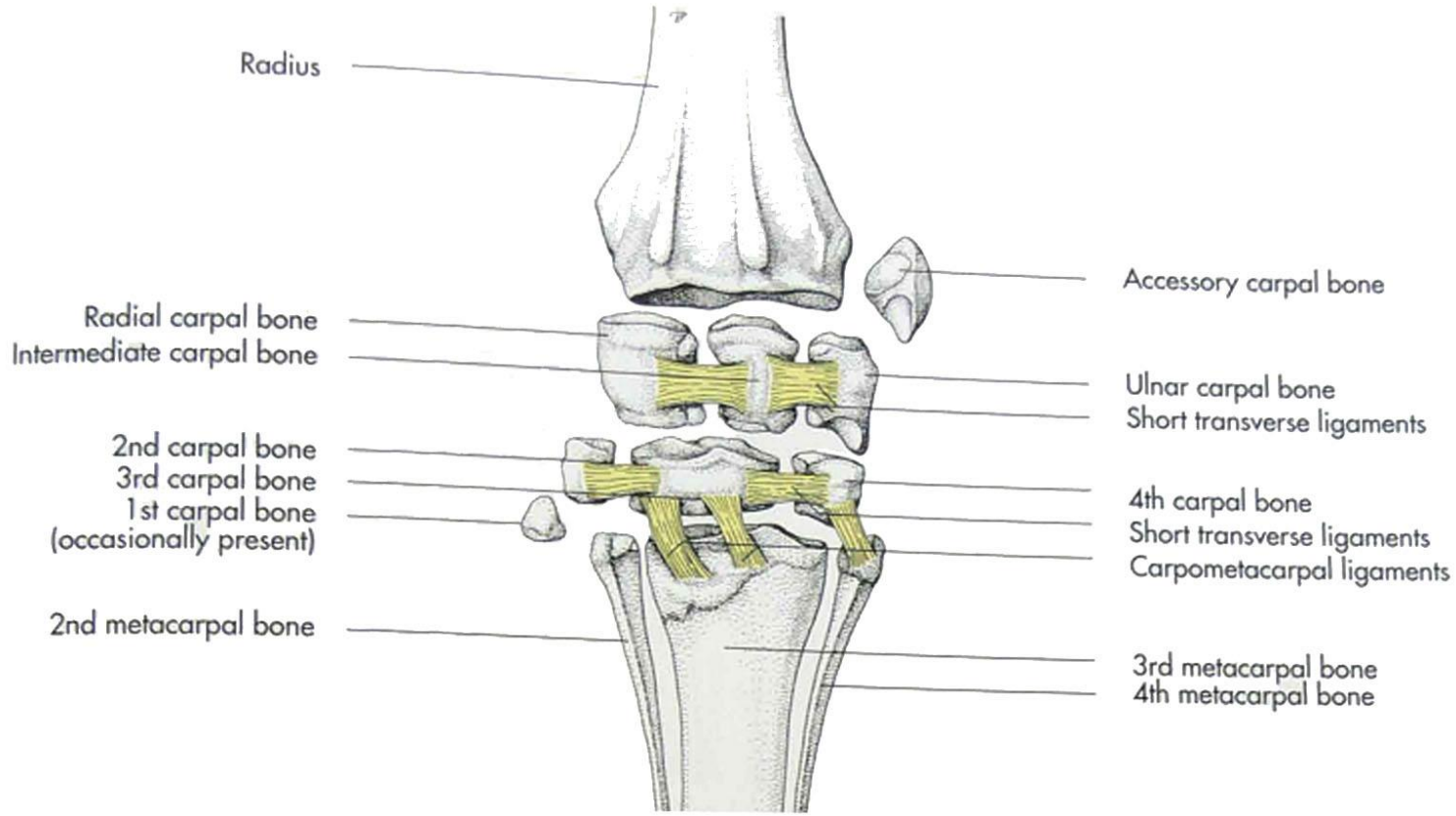
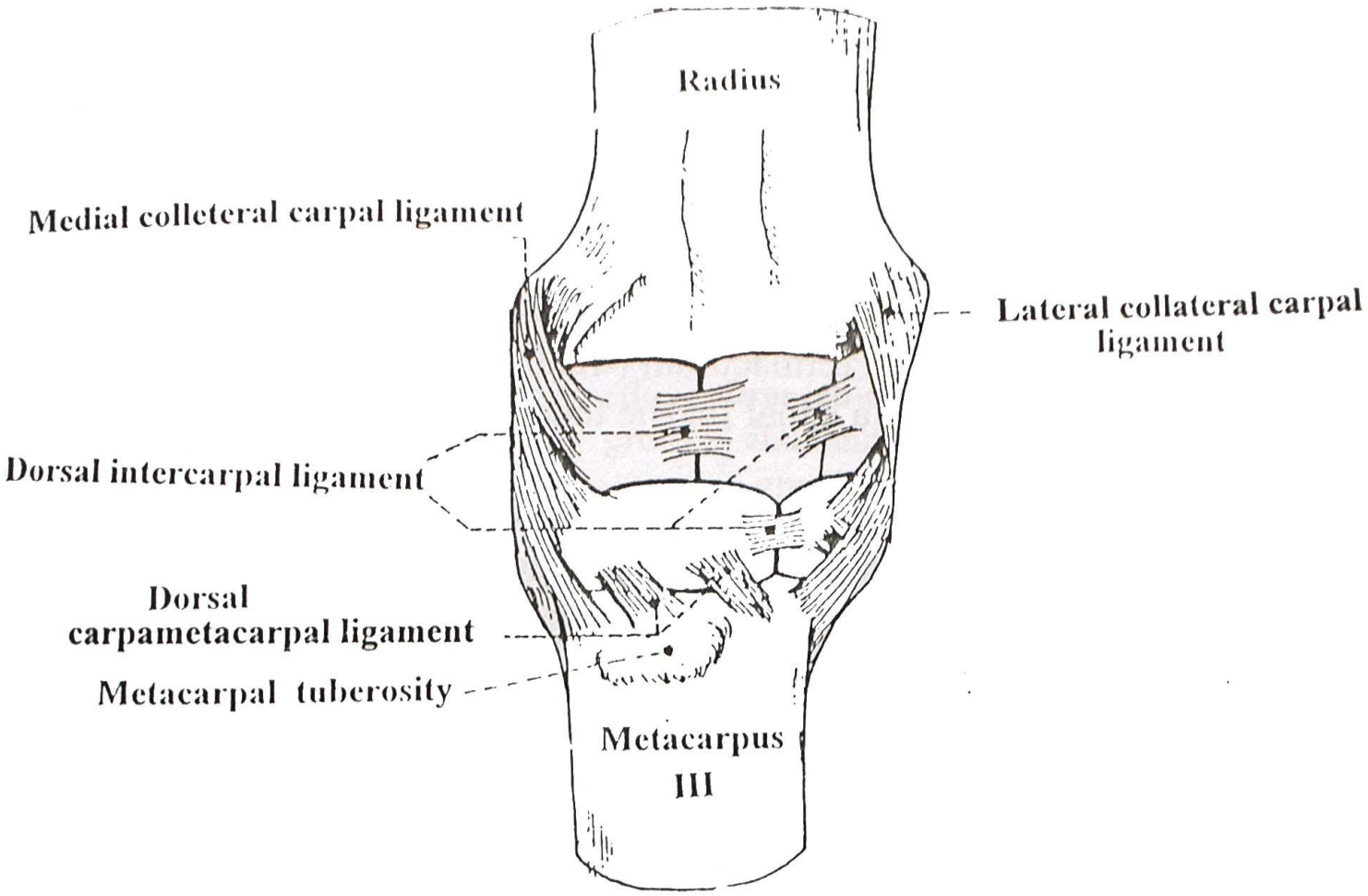
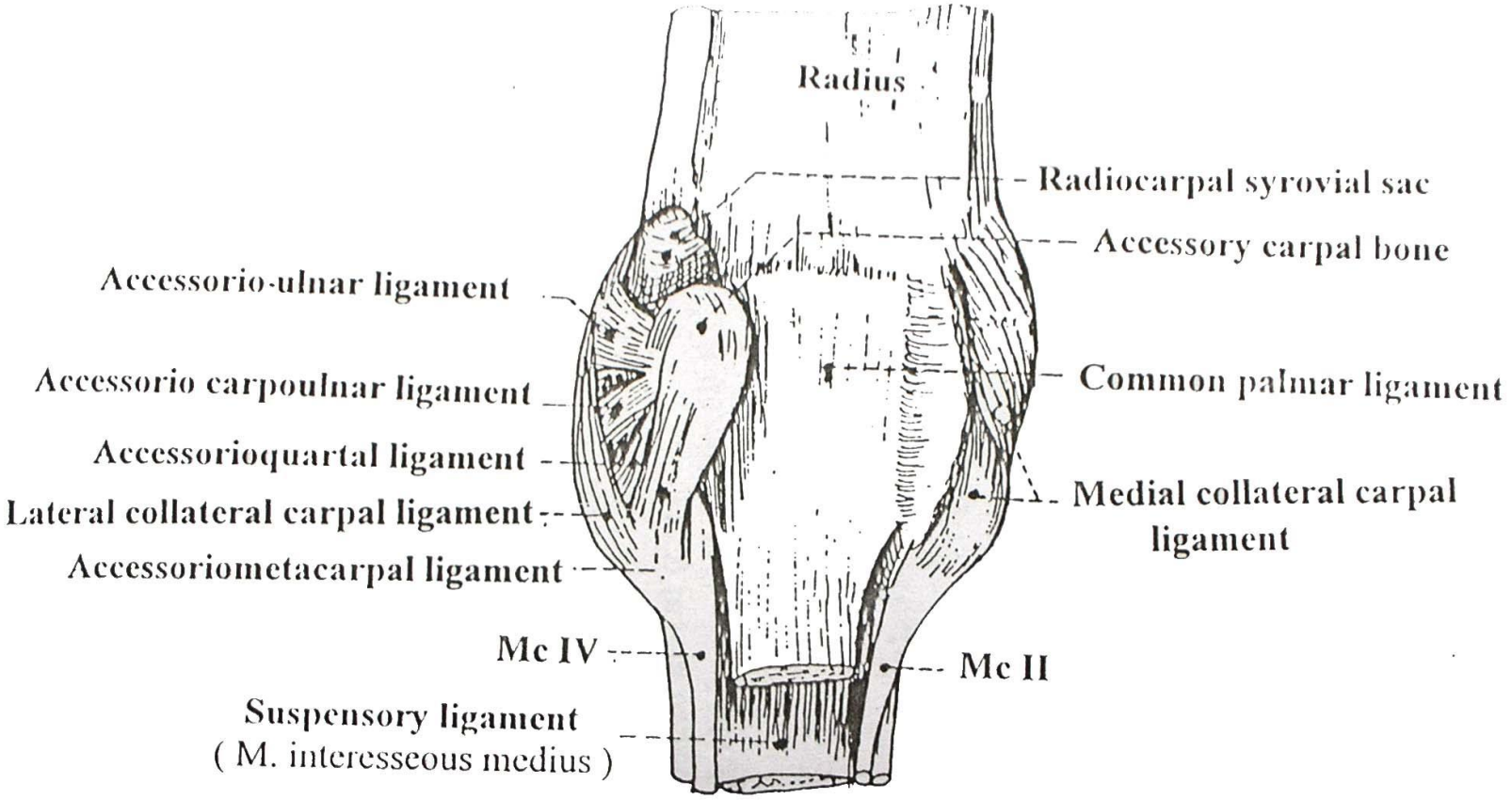


Fig. 3-43. Short ligaments of the left carpus of the horse, with the joint spaces extended (schematic, dorsal aspect) (courtesy of Dr. Susanne Wagner, Vienna).



Left carpal joints; dorsal view. The joint capsule is removed.



Left carpal joints; palmar view.

Carpal canal

1-Boundaries:

Dr: Carpal bones

Lat: Accessory carpal bone

Med: Flexor retinaculum

2-Content:

1-Superficial digital flexor tendon

2-Deep digital flexor tendon

3-Medial palmar A.

4-Medial palmar N.

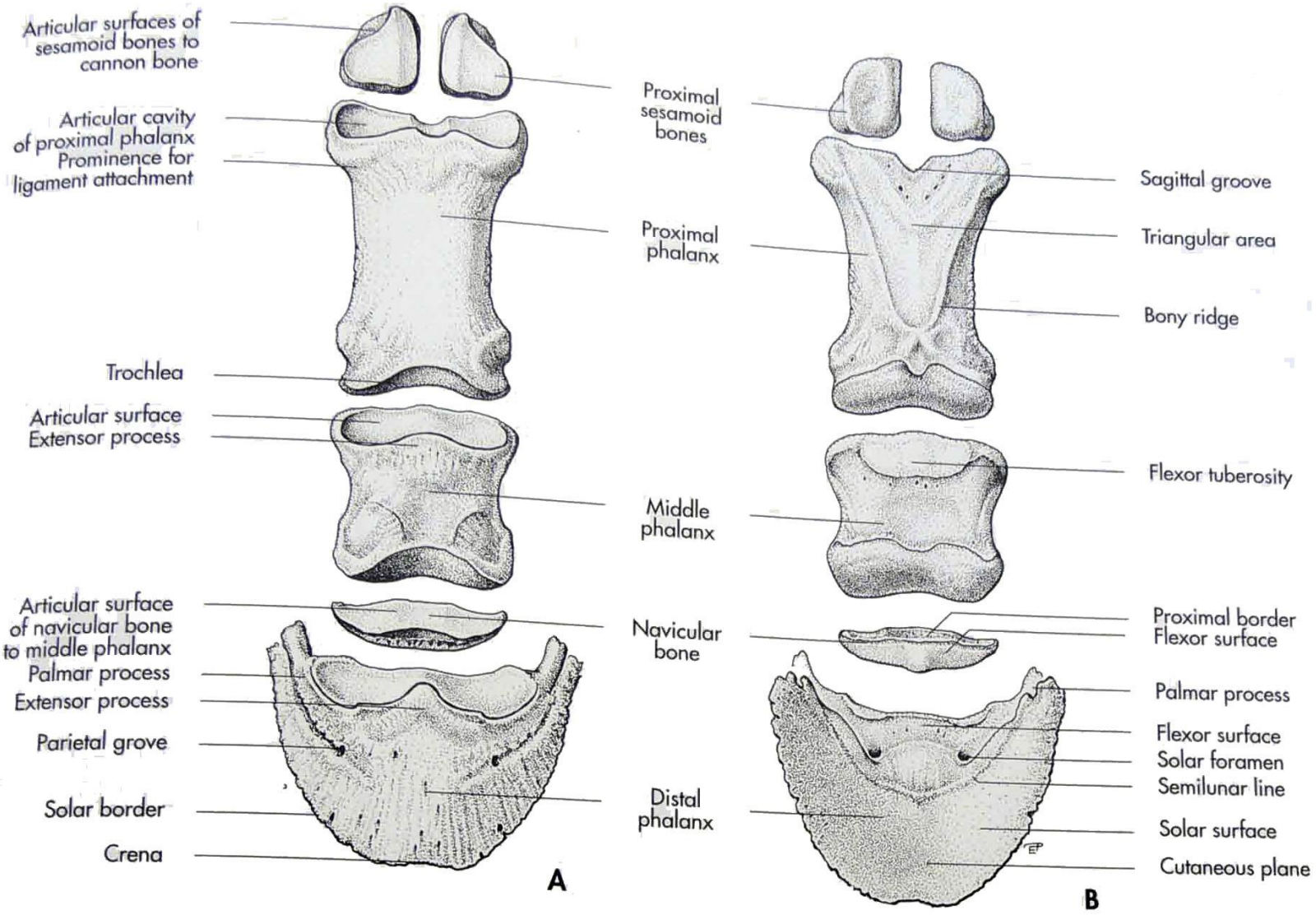


Fig. 3-21. Left digital skeleton of the horse (schematic, **A** dorsal and **B** palmar aspect).

4- Fetlock Joint :

* Type:

compound, hing Joint.

*Movement:

flexion, extension and hyperextension

* Articular surfaces:

-two condyles and ridge of the distal extremity of metacarpus

-Two glenoid cavities and groove of the proximal articular surface of the proximal phalanx.

-Two proximal sesamoid bones.

•Ligaments of fetlock joint: (sesamoidean lig):

1-Medial collateral lig

2-Lateral collateral lig

3-Lateral collateral sesamoidean lig.

4-Medial collateral sesamoidean lig.

5-intersesamoidean lig.

6-Proximal sesamoidean (suspensory) lig.

7-Distal deep (short) sesamoidean lig.

8-Distal middle (oblique) sesamoidean lig.

9-Distal superficial (straight) sesamoidean lig.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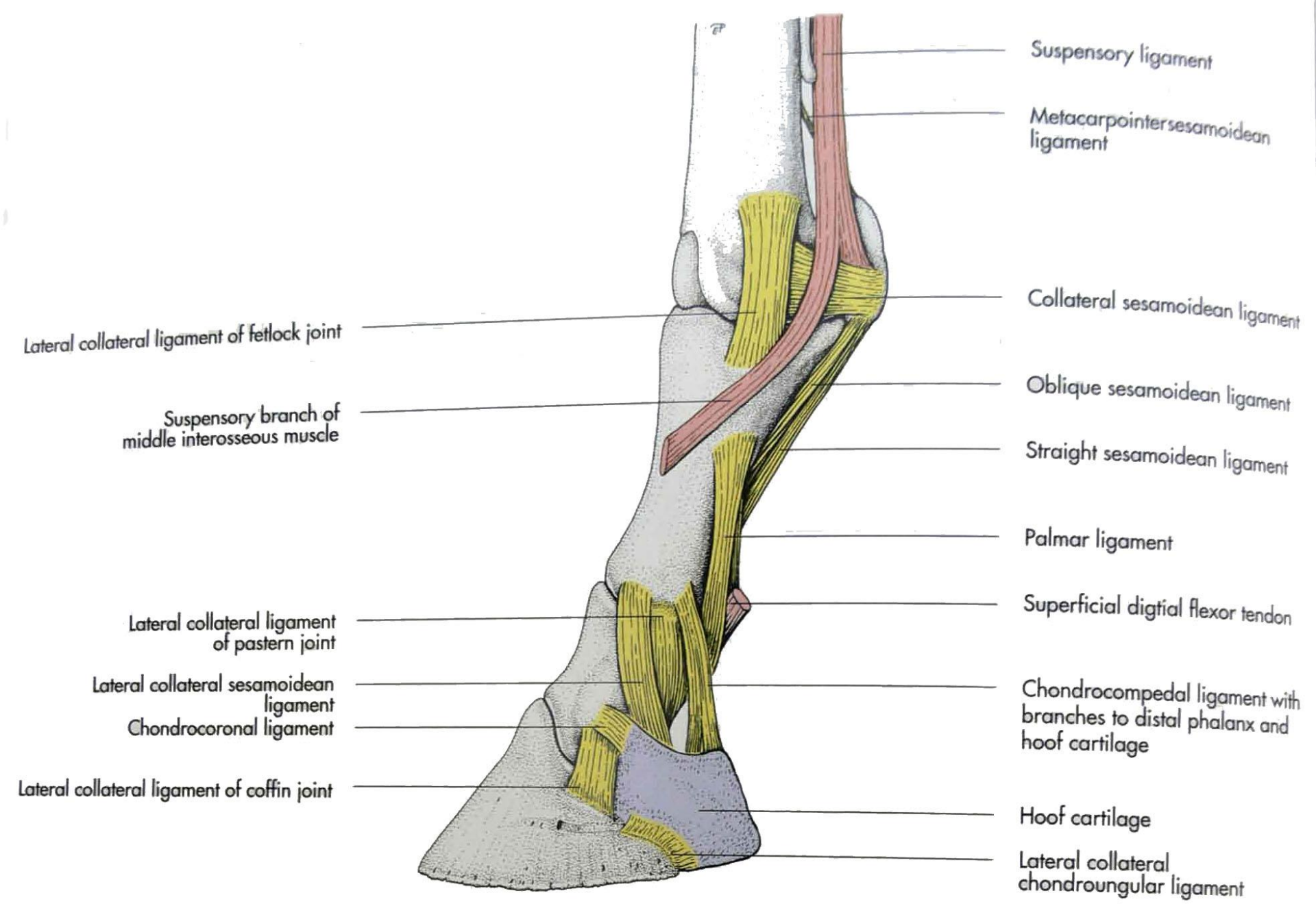
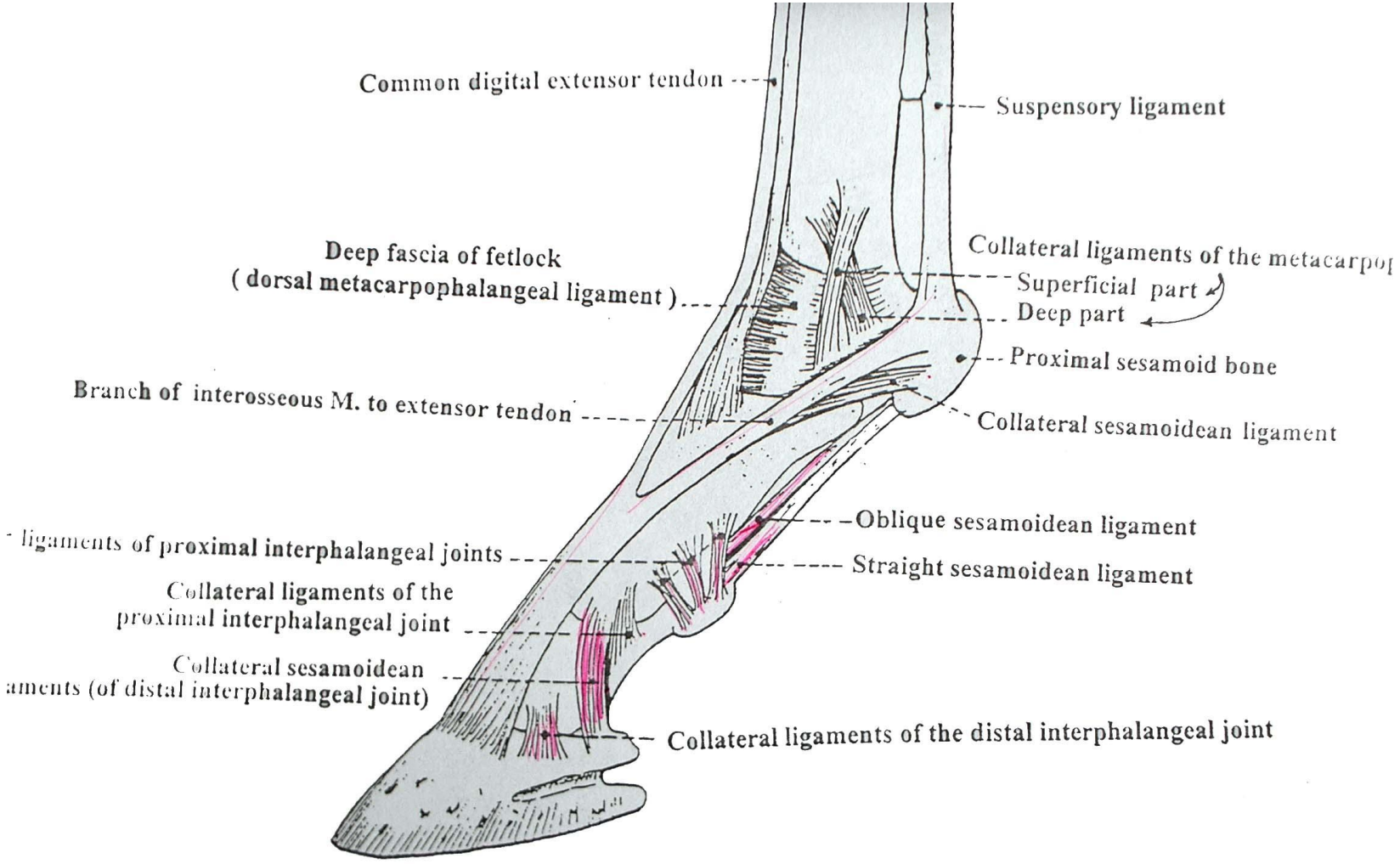
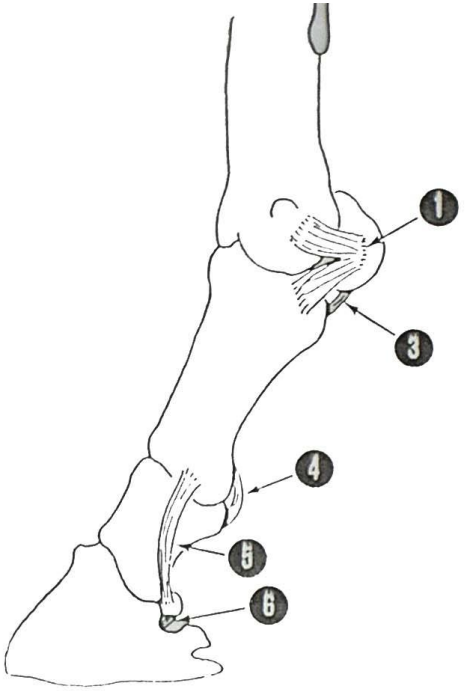
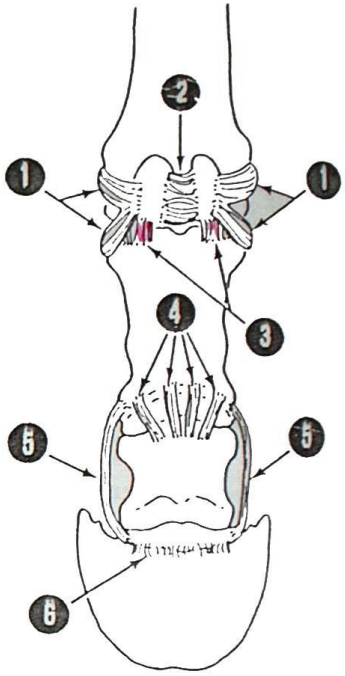

Suspensory ligament
Metacarpointersesamoidean ligament
Collateral sesamoidean ligament
Oblique sesamoidean ligament
Straight sesamoidean ligament
Palmar ligament
Superficial digtial flexor tendon
Chondrocompedal ligament with branches to distal phalanx and hoof cartilage
Hoof cartilage
Lateral collateral chondroungular ligament
Lateral collateral ligament of fetlock joint
Suspensory branch of middle interosseous muscle
Lateral collateral ligament of pastern joint
Lateral collateral sesamoidean ligament
Chondrocoronal ligament
Lateral collateral ligament of coffin joint


Common digital extensor tendon
Suspensory ligament
Deep fascia of fetlock
(dorsal metacarpophalangeal ligament)
Collateral ligaments of the metacarpo
Superficial part
Deep part
Proximal sesamoid bone
Branch of interosseous M. to extensor tendon
Collateral sesamoidean ligament
Oblique sesamoidean ligament
ligaments of proximal interphalangeal joints
Straight sesamoidean ligament
Collateral ligaments of the
proximal interphalangeal joint
Collateral sesamoidean
aments (of distal interphalangeal joint)
Collateral ligaments of the distal interphalangeal joint



Lateral aspect

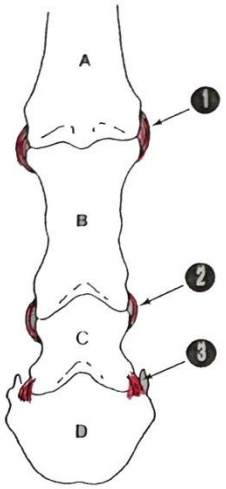


Palmar aspect

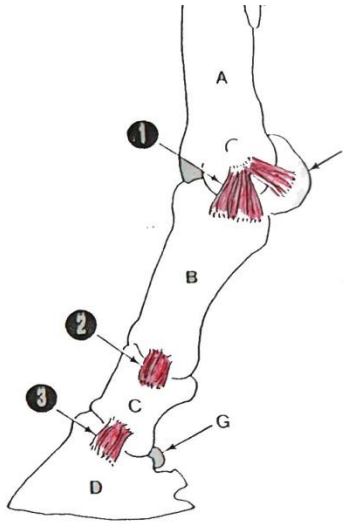
Ligaments of the digital joints

(hoof cartilage removed)

1. Collateral sesamoidean ligaments
2. Palmar ("intersesamoidean") ligament
3. Short sesamoidean ligament
4. Palmar ligaments of proximal interphalangeal joints
5. Collateral sesamoidean ligaments (of distal interphalangeal joint)
6. Distal sesamoidean impar ligament



Dorsal aspect



Lateral aspect

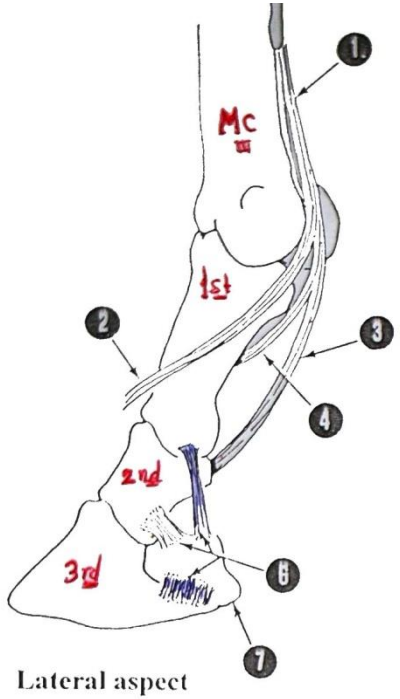
Collateral ligaments of the digital joints

(hoof cartilage removed)

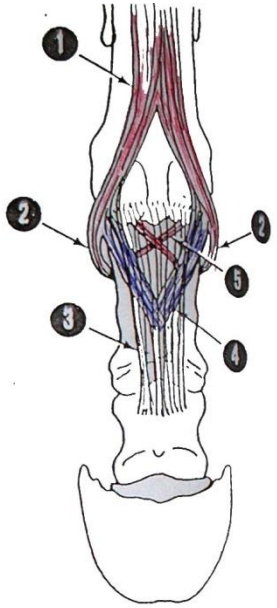
1. Collateral ligaments of the metacarpophalangeal joint
2. Collateral ligaments of the proximal interphalangeal joint
3. Collateral ligaments of the distal interphalangeal joint.

* Skeletal components:

A. Third metacarpal bone
B. Proximal phalanx
C. Middle phalanx
D. Distal phalanx
E. Fourth metacarpal bone
F. Proximal sesamoid bone (lateral)
G. Distal sesamoid bone



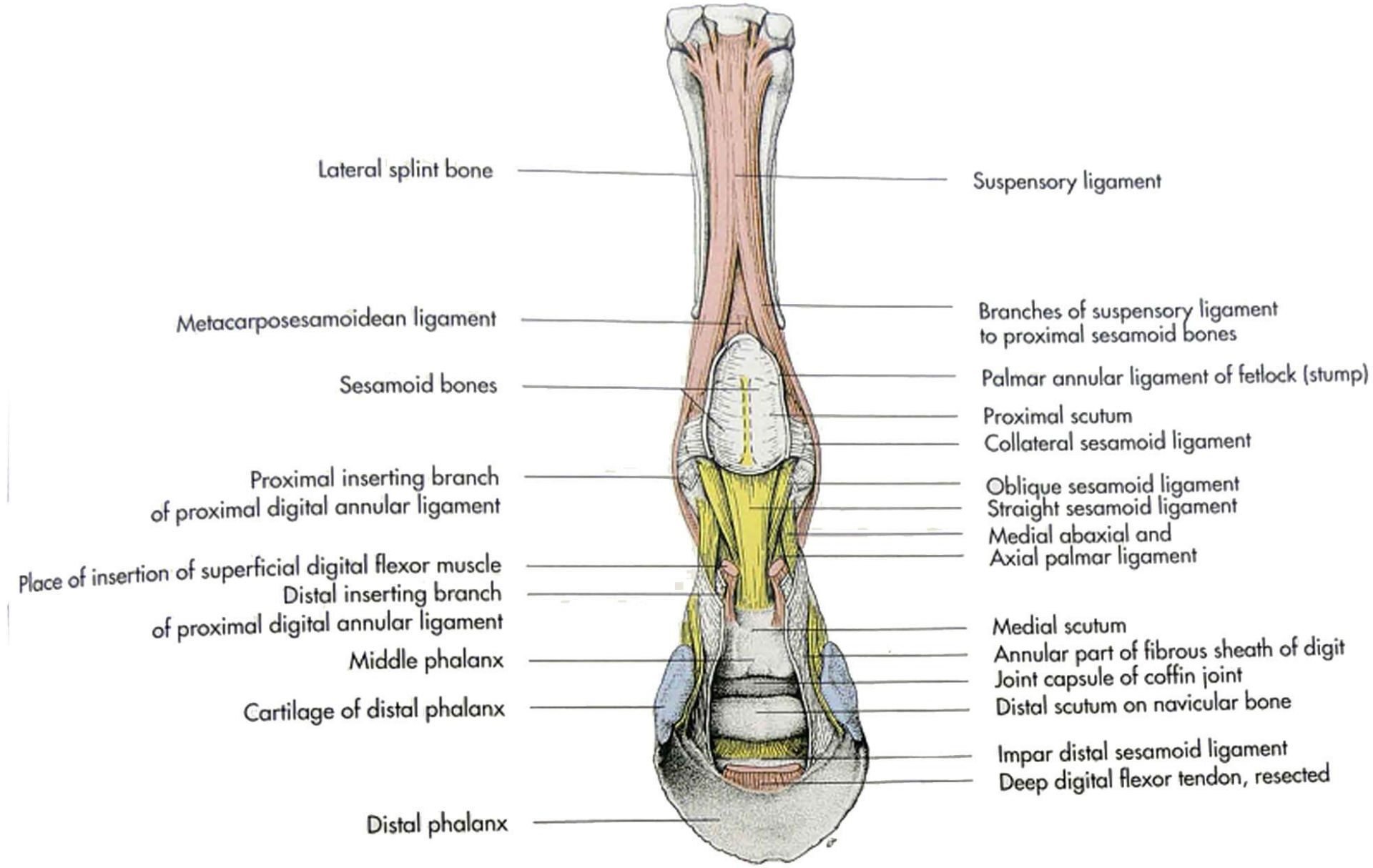
Lateral aspect



Palmar aspect

"Suspensory ligament," distal sesamoidean ligaments, and ligaments of the hoof cartilage

1. Interosseous M. ("suspensory lig.")
2. Branch of interosseous M. to extensor tendon
3. Straight sesamoidean ligament
4. Oblique sesamoidean ligament
5. Cruciate sesamoidean ligament
6. Ligaments of the ungual cartilage
7. (Lateral) ungual cartilage (cartilage of the hoof)


Lateral splint bone
Suspensory ligament
Metacarposesamoidean ligament
Branches of suspensory ligament to proximal sesamoid bones
Sesamoid bones
Palmar annular ligament of fetlock (stump)
Proximal scutum
Collateral sesamoid ligament
Proximal inserting branch of proximal digital annular ligament
Oblique sesamoid ligament
Straight sesamoid ligament
Medial abaxial and Axial palmar ligament
Place of insertion of superficial digital flexor muscle
Distal inserting branch of proximal digital annular ligament
Medial scutum
Annular part of fibrous sheath of digit
Middle phalanx
Joint capsule of coffin joint
Cartilage of distal phalanx
Distal scutum on navicular bone
Impar distal sesamoid ligament
Deep digital flexor tendon, resected
Distal phalanx

5- Pastern Joint:

* Type:

simple, hing joint

* Movement:

flexion and extension

* Articular surface:

Two condyles and groove on the distal extremity of proximal phalanx.
Two cavities and ridge on the proximal articular surface of the middle phalanx.

* Ligaments:

-Two collateral ligaments

-palmar ligaments (4) in no.

two central lig(a) medial(b) and lateral lig(c).

6- Coffin Joint:

* Type:

composite, hing Joint

* Movement:

flexion & extension

The Joint lies within the Hoof.

* Articular surfaces:

-Distal articular surfaces of middle phalanx.
-Articular surfaces of 3rd phalanx.
-Distal sesamoid (Navicular) bone.

* Ligaments:

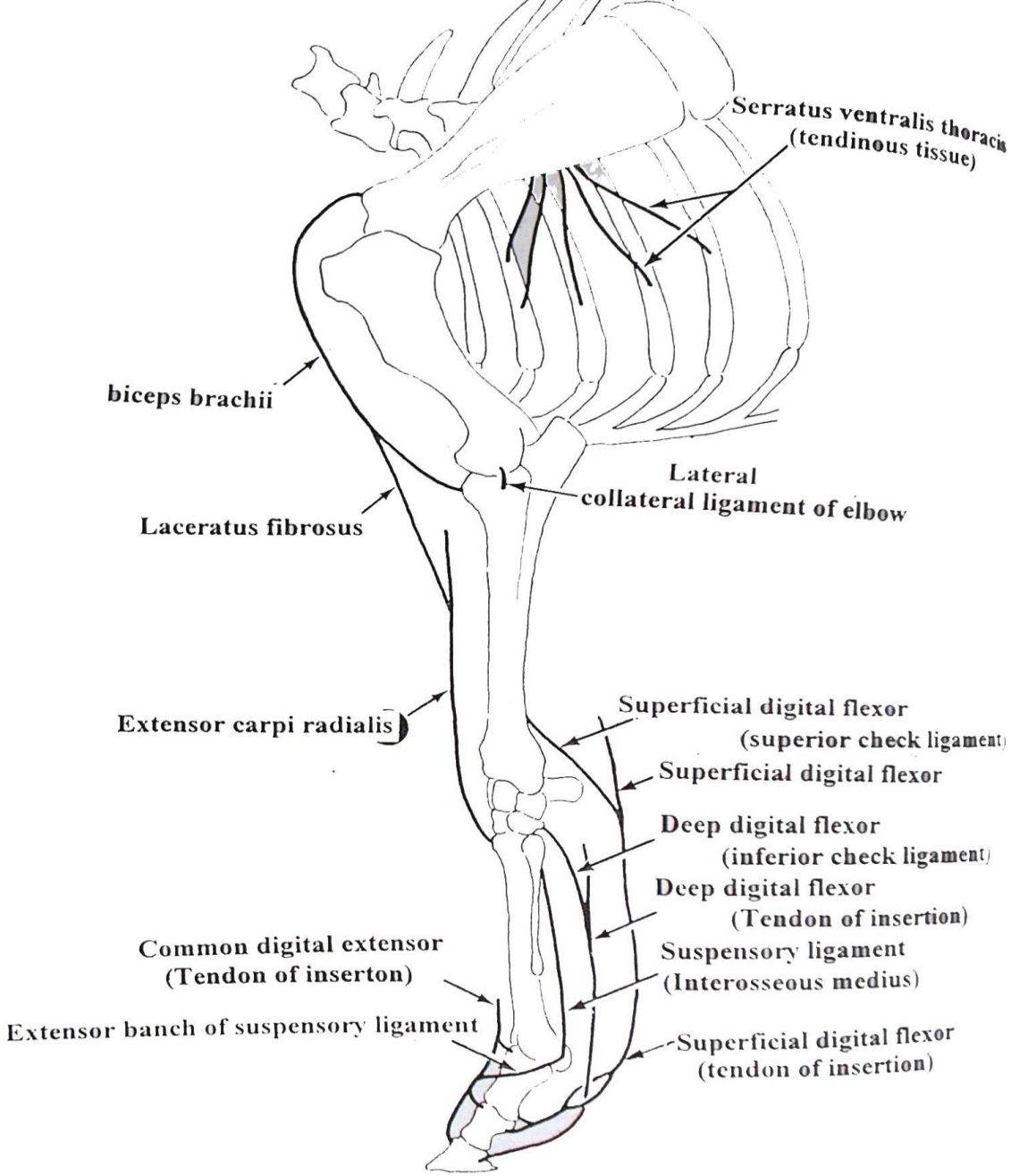
1-Two collateral ligaments.
2-Two strong collateral sesamoidean. Lig.
3-Distal sesamoidean lig.

** Stay apparatus of the thoracic limb

Def. (These are group of structures that permit the horse to stand while he sleeps standing with little muscular activity).

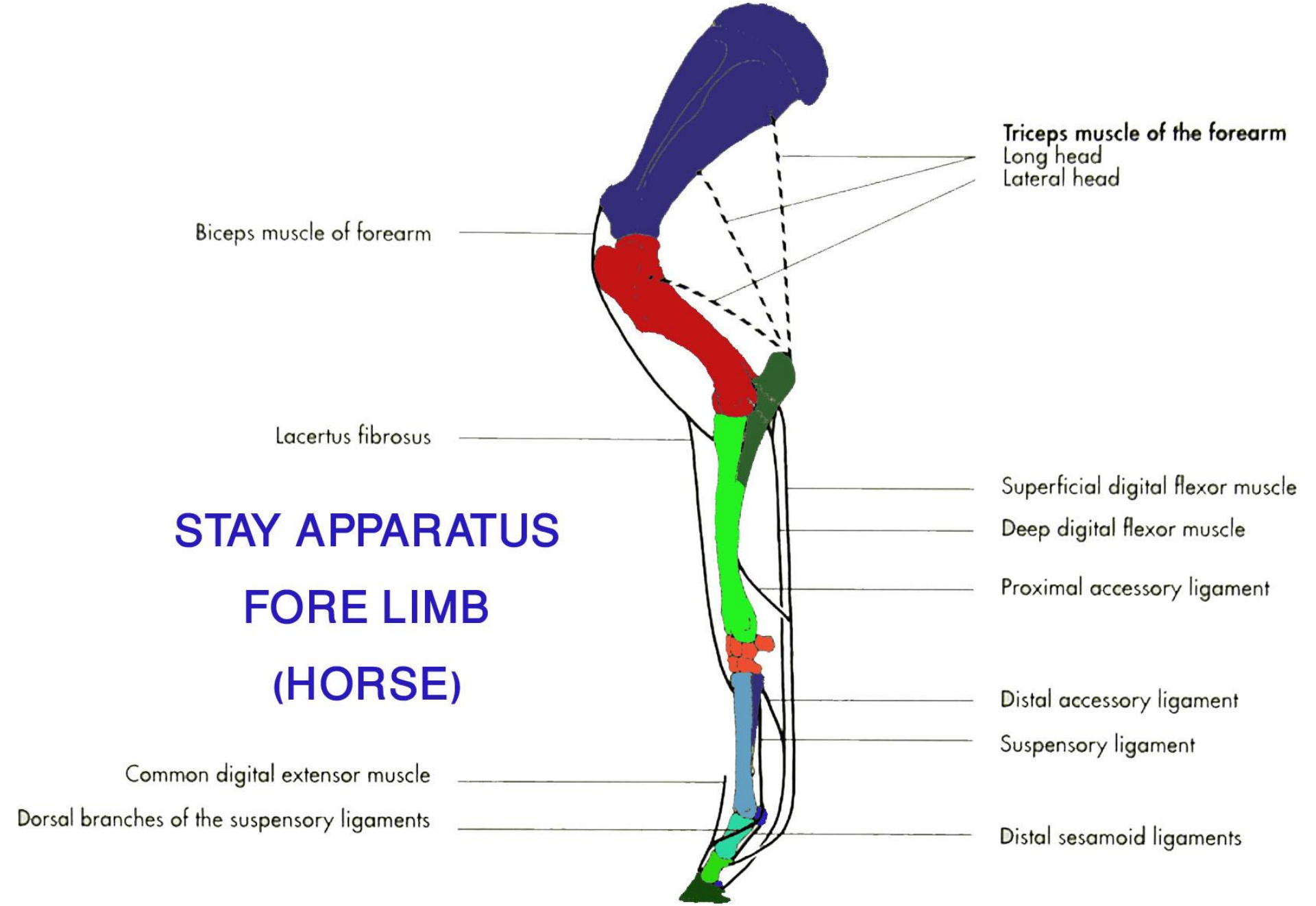
It is consist from :

1-serratus ventralis thoracalis.
2-Biceps brachii
3-laceratus fibrosus.
4-Extensor carpi radialis.
5-Common digital extensor tendon.
6-superf. dig. flexor tendon.
7-Deep dig. Flexor tendon.
8-suspensory lig.and its extensor branch.
9-Sesamoidean ligaments (prevent excessive hyperextension of the fetlock joint).

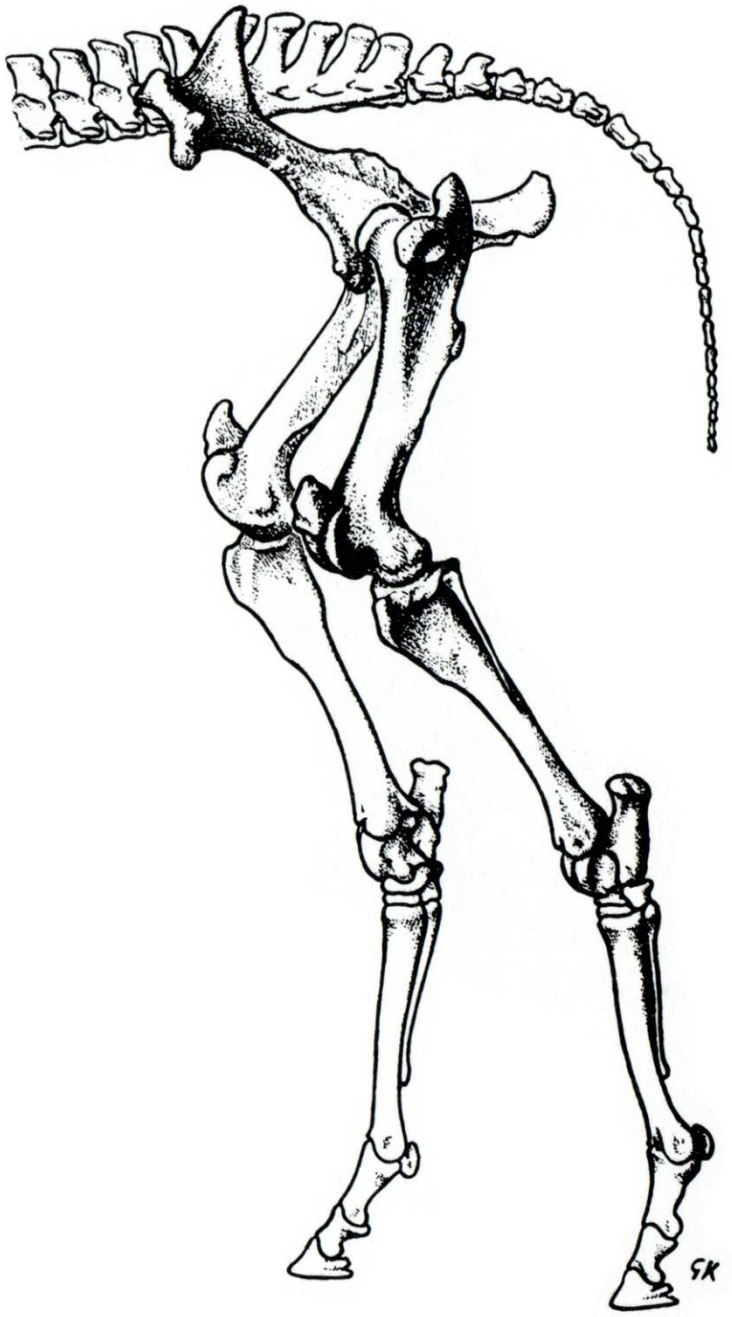


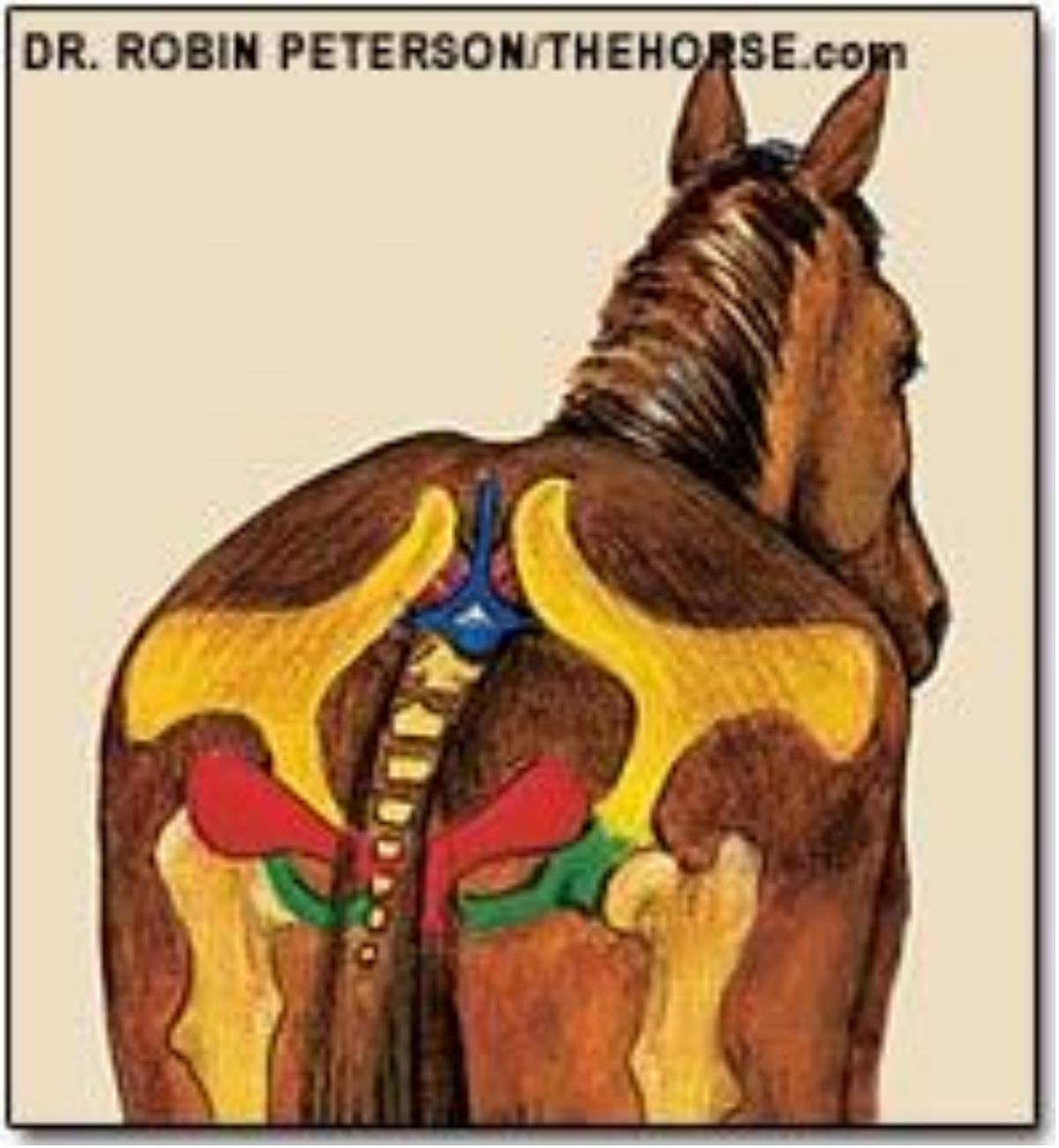
Stay apparatus of the thoracic limb

STAY APPARATUS FORE LIMB (HORSE)



Pelvic limb




DR. ROBIN PETERSON/THEHORSE.com

Pelvic limb

1- Sacroiliac articulation:

Articular surfaces:

articular facets on the sacropelvic surface of ilium and wing of sacrum.

Ligaments of the pelvic girdle (sacroiliac J)

1- dorsal sacroiliac lig.

It extends from the sacral tuberosity of ilium to the summits of sacral spines.

2- Broad sacrotuberal (sacroischiatic) lig.

Brood quadrilateral sheet ώ complete the lateral pelvic wall.
Its dorsal border attached to the border of sacrum and spinous process of ist & 2nd caudal vertebra.

3- iliolumbar lig

It is triangular sheet attach the ends of lumbar transverse processes to the sacropelvic surface of the ilium.

•Pelvic symphysis:

Consists of pubic and ischial symphysis, is a cartilaginous Joint ώ undergo ossification in old ages.

* Obturator membrane:

Thin layer of fibrous tissue ώ closes the obturator foramen except small passage (obturator canal) for the obturator N.,A. and V.

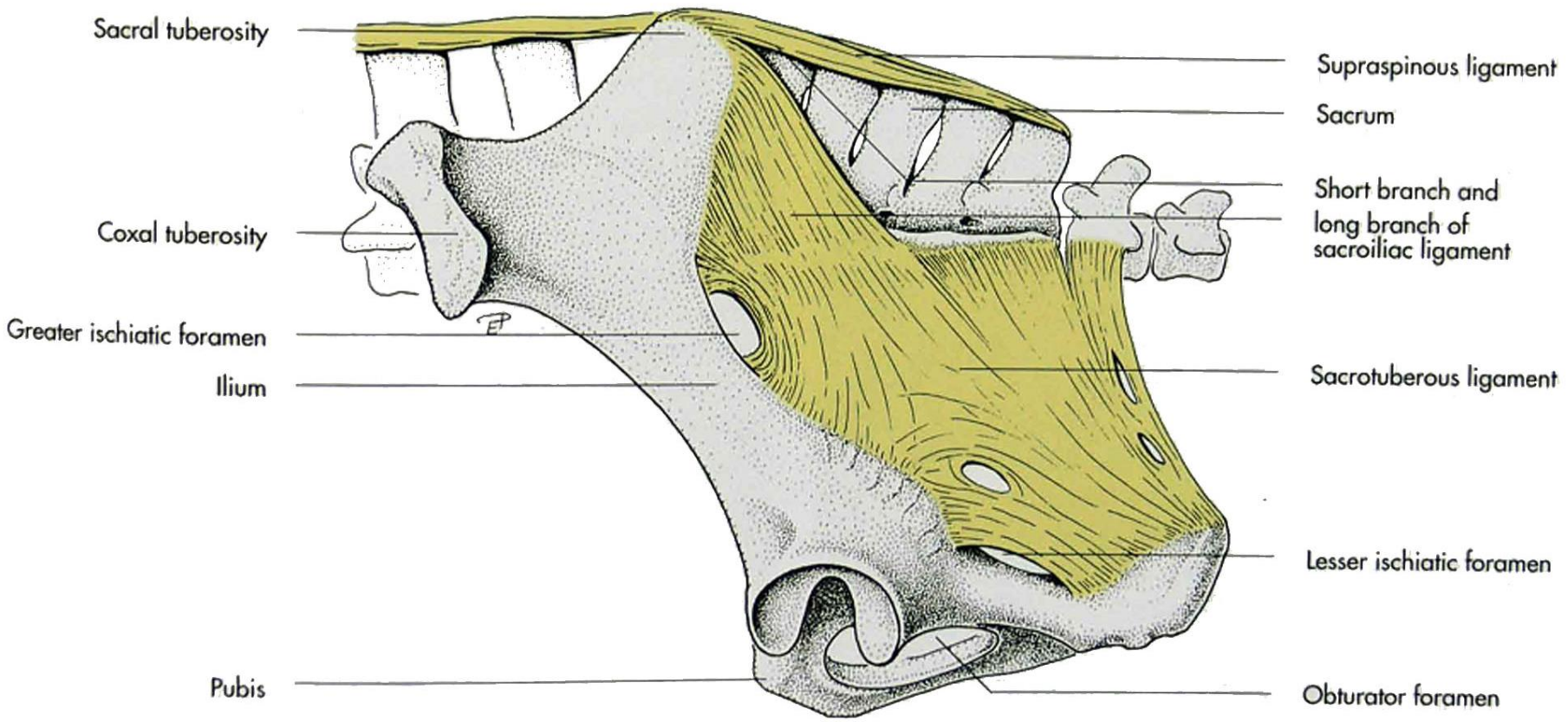


Fig. 4-48. Ligaments of the pelvis of the horse (schematic) (Ghetie, Pastea and Riga, 1955).

2- Hip or coxal articulation:

* Type:

Simple Ball & sockel (spheroidal).

* Movement:

All types.

* Articular surfaces:

(1) Head of femur
(2) acetabulum:
the acetabulum is a cotyloid cavity, its articular surfaca is the semilunar facet ώ is cut by acetabular notch and fossa. It surrounded by marginal cartilage (acetabular lip)

•Ligaments:

1- Ligaments of the head of femur:

a- round ligament

It is strong lig. ώ attach the fovea capitis to acetabular fossa.

b- Accessory lig.

Only in equines, it extends from the prepubic tendon to the fovea capitis.

2- Transverse acetabular lig.:

The lig. which complete the rim of the acetabulum, closes the acetabular notch.

-prepubic tendon (cranial pubic ligament)

-accessory ligament of the head of the femur

-ligament of the head of the femur

-acetabular lip

-transverse acetabular ligament

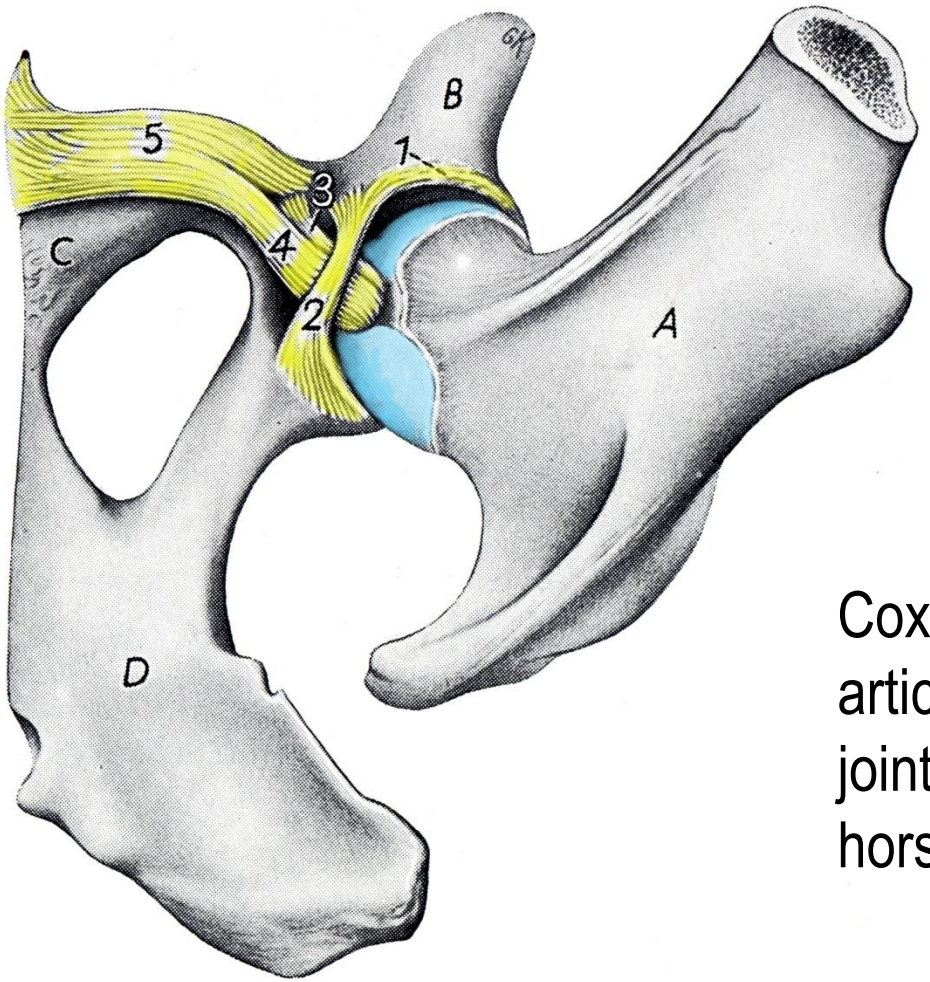
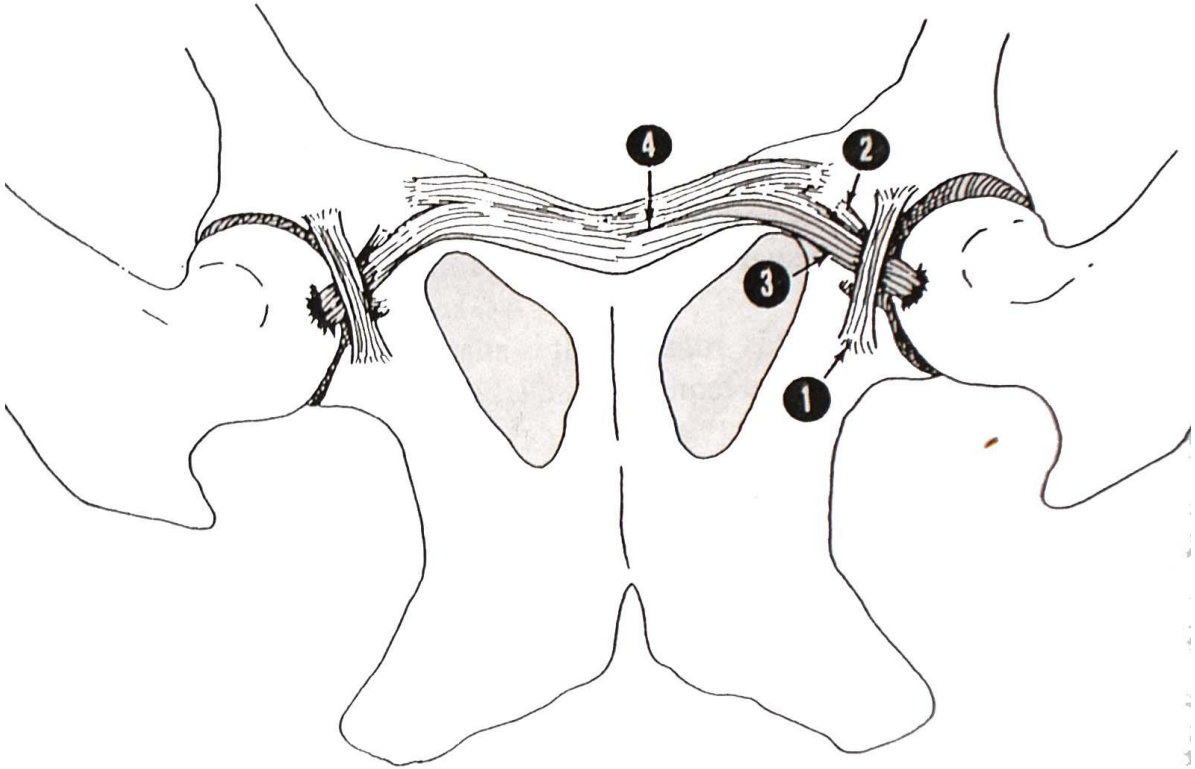


Fig. 329. Left hip joint of the horse. Joint capsule removed. Ventrocaudal aspect.

A os femoris; *B* ilium; *C* pubis; *D* ischium

1 labrum acetabulare; *2* lig. transversum acetabuli; *3* lig. capitis ossis femoris; *4* lig. accessorium ossis femoris; *5* lig. pubicum cran.

Coxofemoral articulation (hip joint) in the horse.



Coxal joints ; ventral view

1. Transverse acetabular lig.
2. Lig. of femoral head (round lig.)
3. Accessory lig. of femur bone
4. Prepubic tent on (central part of the cranial pubic ligament)

3- Stifle (genual articulation)

***Type:** compound, hing Joint;

consists of two articulations.

A- Femoropatellar Articulation:

* Articular surfaces:

(1) Articular surfaces of patella: is smaller and completed by Para patellar cart.

(2) Trochlea of the femur two slightly oblique ridges; medial is larger than lateral, separated by deep groove.

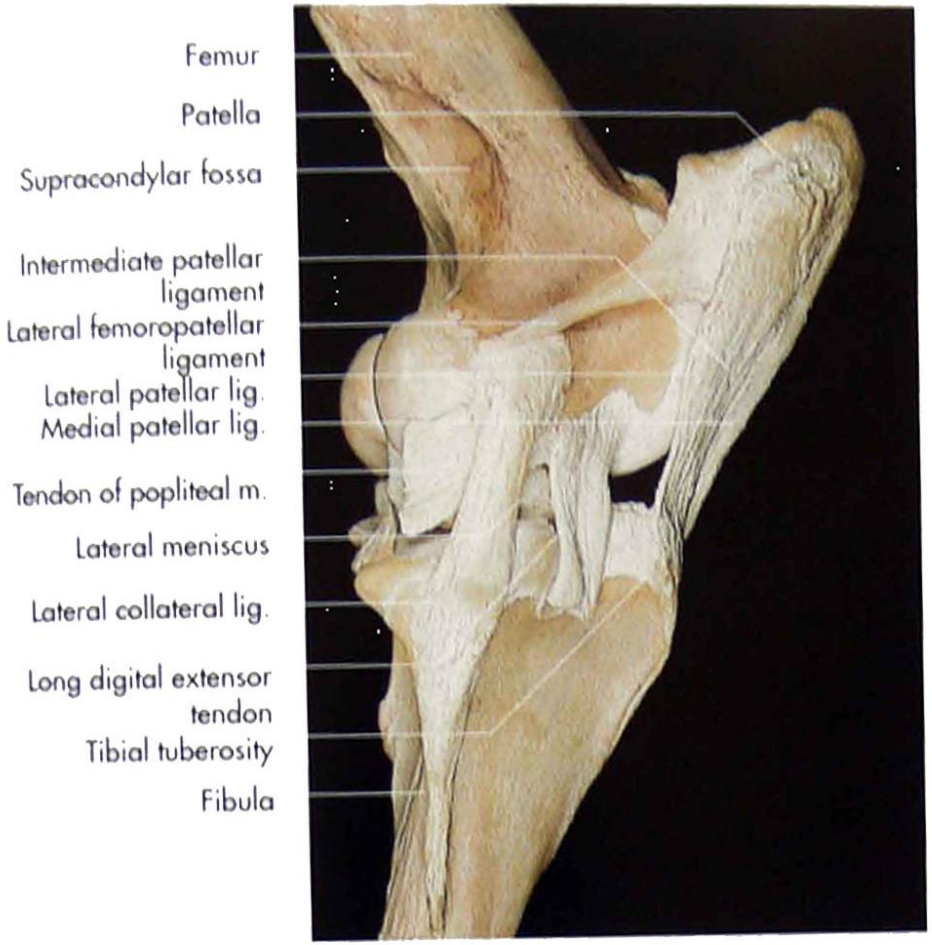


Fig. 4-56. Right stifle joint of a horse (lateral aspect) (courtesy of Dr. Margit Teufel, Vienna).

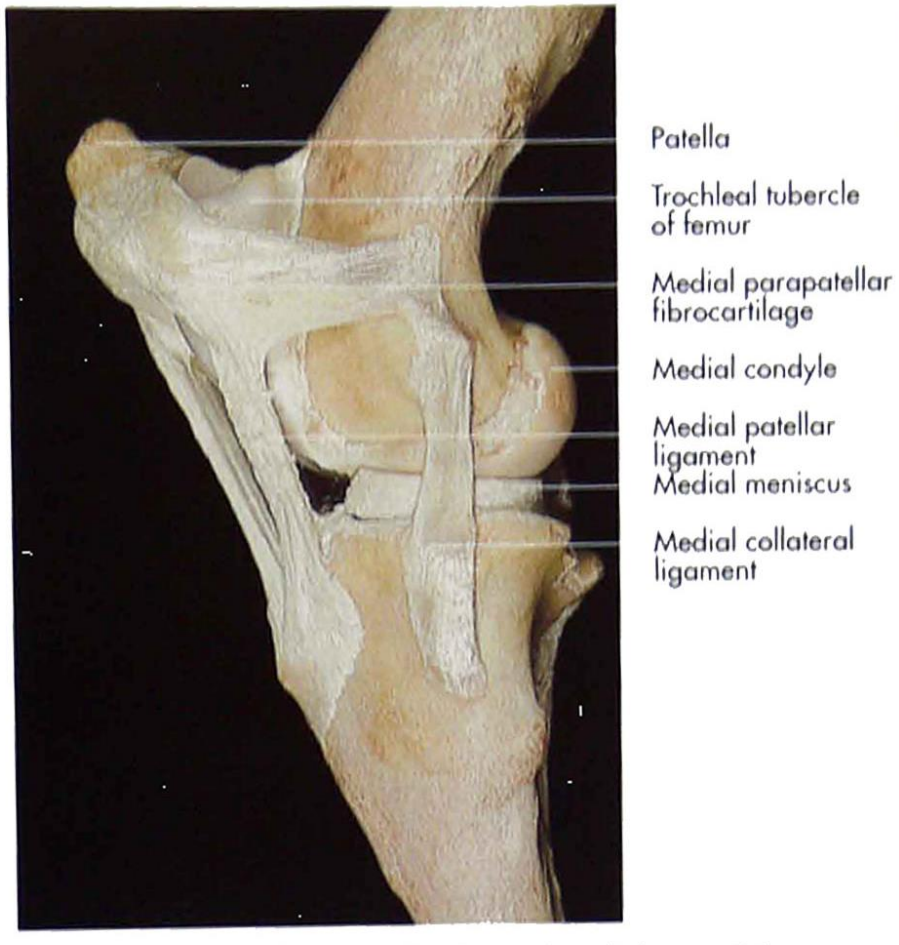
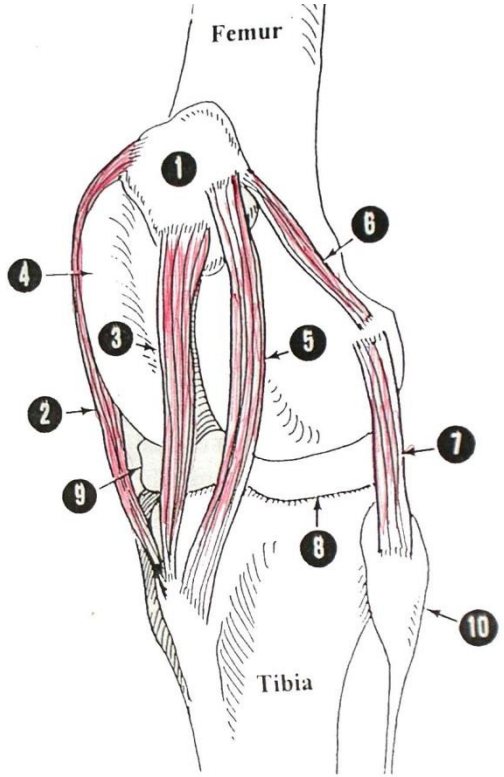
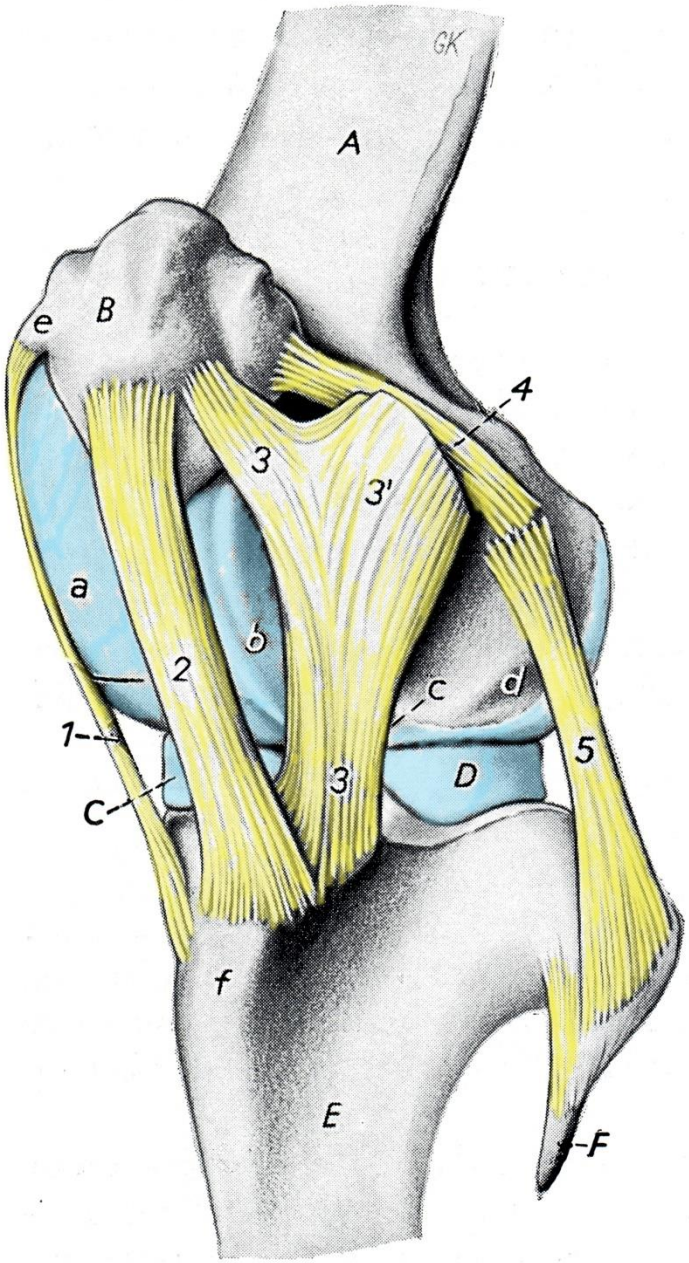


Fig. 4-57 Right stifle joint of a horse (medial aspec) (courtesy of Dr. Margit Teufel, Vienna).



Ligaments of the stifle joint; craniolateral view

1. Patella
2. Medial patellar Lig.
3. Intermediate (middle) patellar lig.
4. Enlarged medial ridge of femoral trochlea
5. Lateral patellar lig.
6. Lateral femoropatellar lig.
7. Lateral collateral lig.
8. Lateral meniscus
9. Medial meniscus
10. Fibula



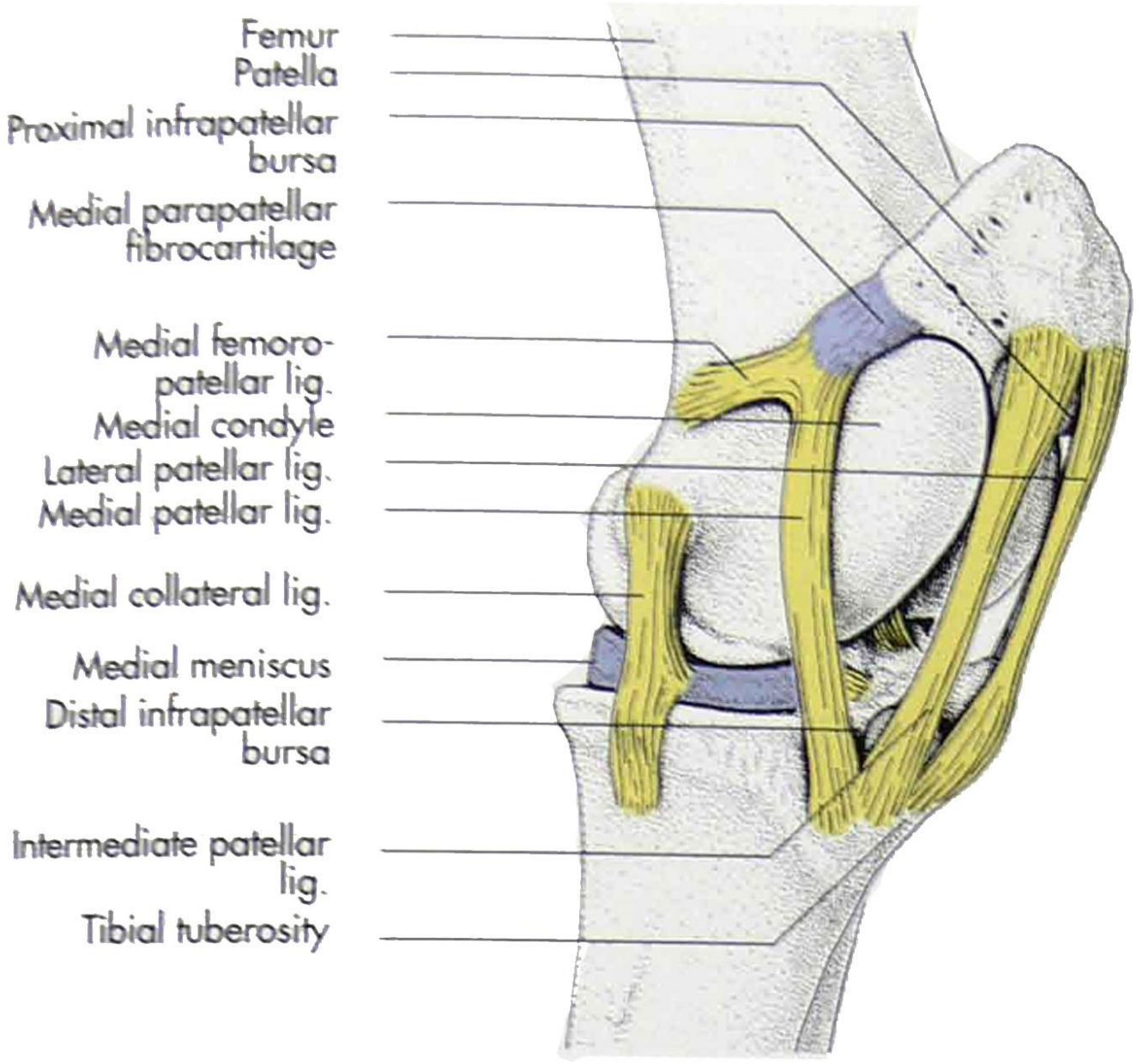


Fig. 4-50. Ligaments of the left stifle joint of the horse (schematic, medial aspect) (Ghetie, Pastea and Riga, 1955).

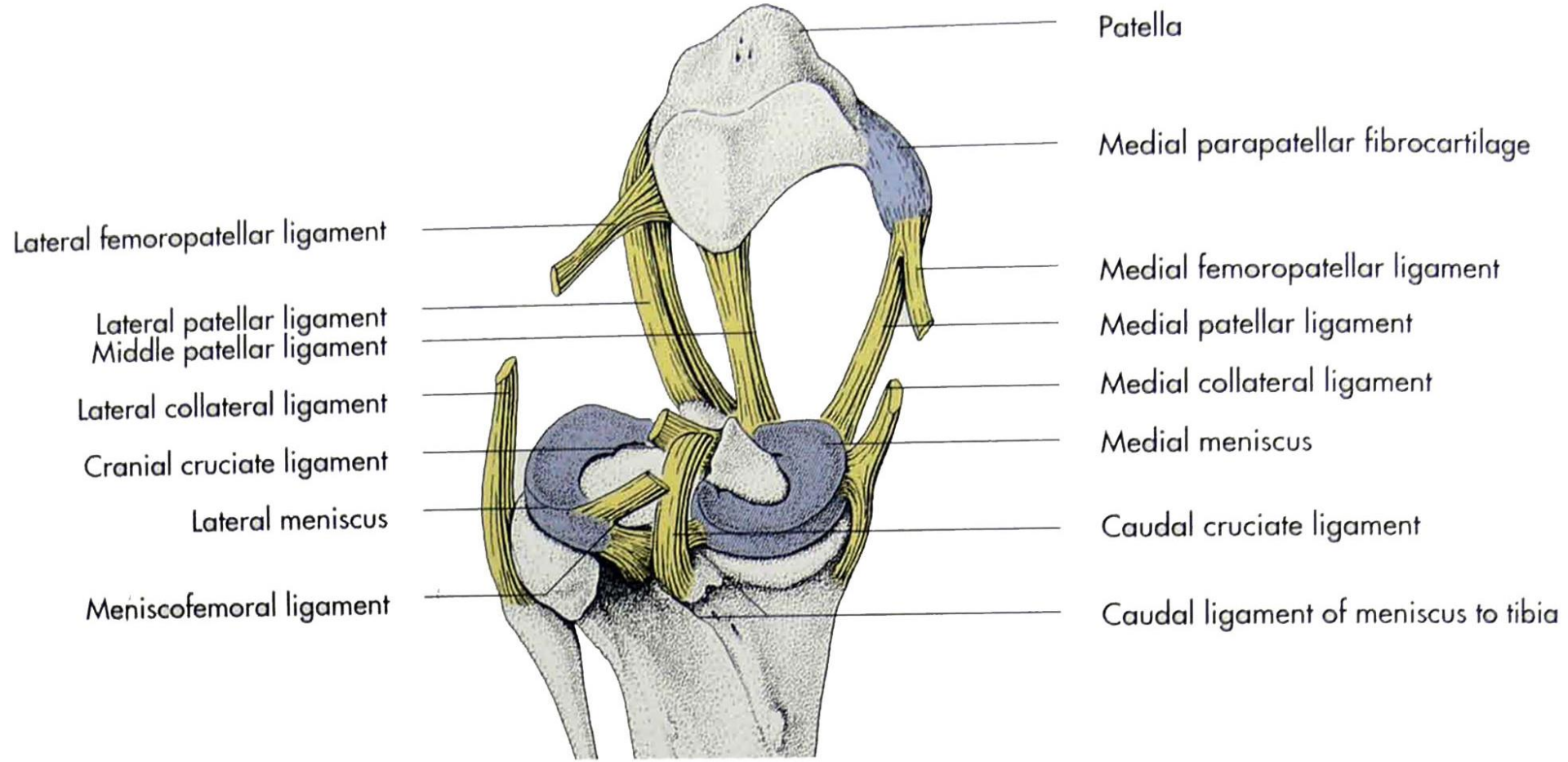


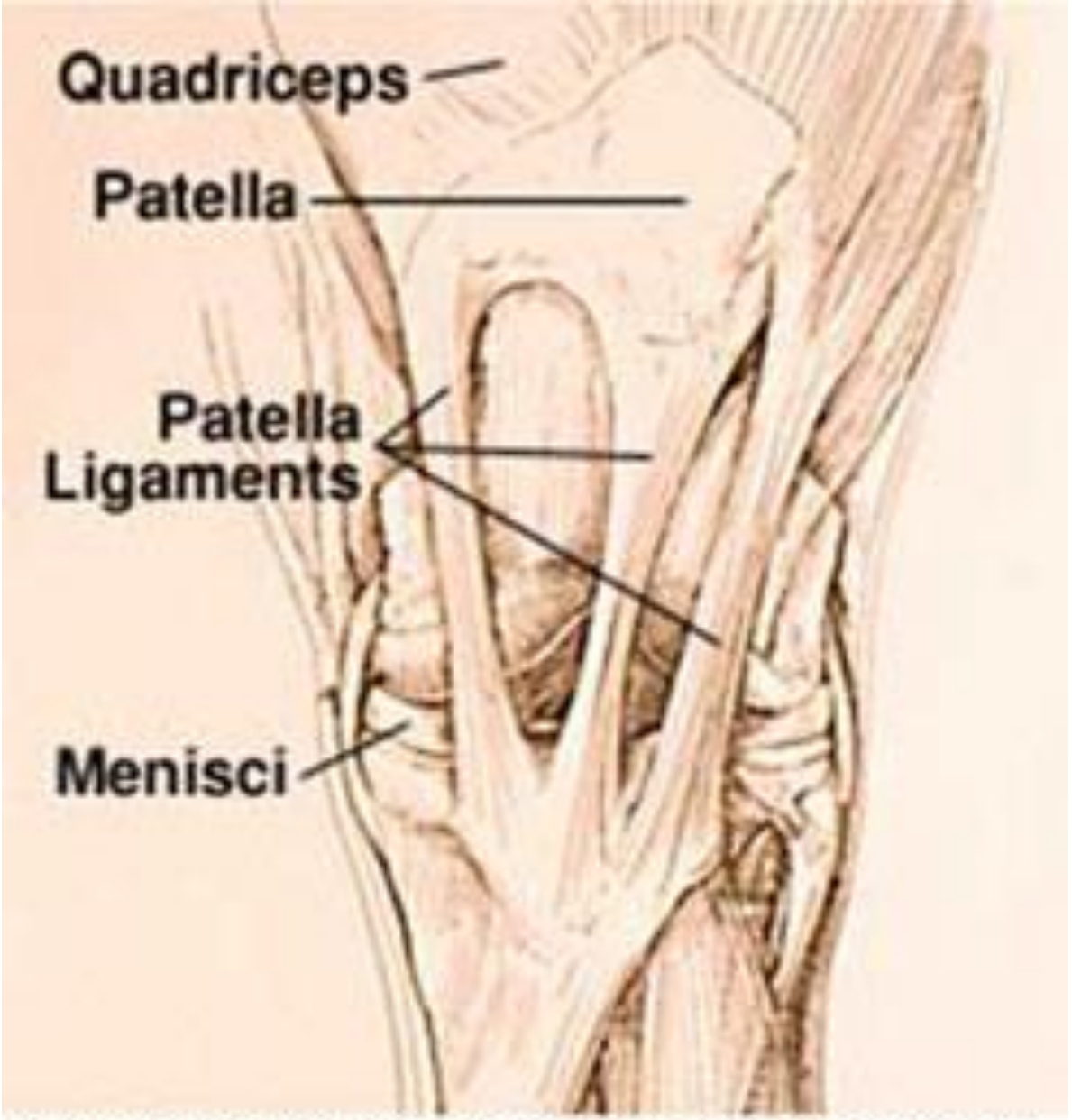
Fig. 4-54. Ligaments of the left stifle joint of the horse after removal of the distal end of the femur (schematic, caudal aspect) (Ghetie, 1967).

•Ligaments

medial and lateral femoropatellar ligaments: attaches the patella to epicondyles of the femur.

Patellar ligaments

medial, middle and lateral patellar ligaments: three strong lig. attach the patella to the tibial tuberosity



A horse's stifle joint as seen from the front.

B- Femorotibial Joint :

*** Articular surfaces:**

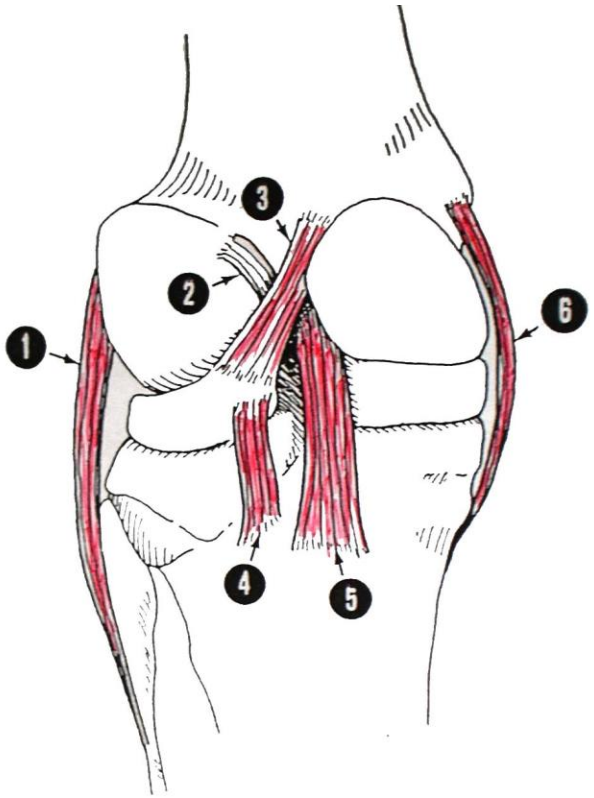
(1)Two condyles of the dist. extremity of the femur.
(2)Two condyles of the proximal ext. of the Tibia
(3) It is provided with two cresenteric Mensci ,medial and lateral

*** Joint capsule:**

there are two synovial sacs, and each of them is partially divided by the meniscus into proximal and distal part.

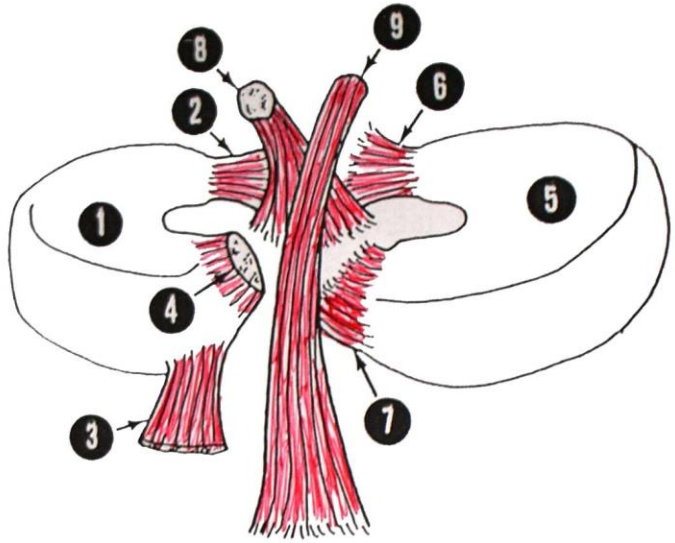
*** Ligaments:**

1, 2- medial and lateral collateral ligs.
3-4- cranial and caudal cruciate lig ώ attach to intercondyloid fossa of femur to tibia. They cross each other forming X- shape.
5- Menisco femoral lig of lat. menscus.
6- cranial (a) and caudal (b) menisco tibial ligs.



Ligaments of the stifle joint; caudal view

1. Lateral collateral lig .
2. Cranial cruciate lig.
3. Meniscofemoral lig.
4. Caudal tibial lig. of lateral meniscus
5. Caudal cruciate lig.
6. Medial collateral lig.



7 **Ligaments of the stifle joint ; caudal view**.
(Isolated menisci from the left stifle joint)

1. Lateral meniscus
2. Cranial tibial lig.of lateral meniscus
3. Caudal tibial lig.of lateral meniscus
4. Meniscofemoral lig.
5. Medial meniscus
6. Cranial tibial lig. of medial meniscus
7. Caudal tibial lig. of medial meniscus
8. Cranial cruciate lig.
9. Caudal cruciate lig.

Muscles acting on the stifle Joint:

Extensors:

Quadriceps femoris muscles attached to patella (Rectus femoris & 3 vastus; medialis, lateralis and intermedius)

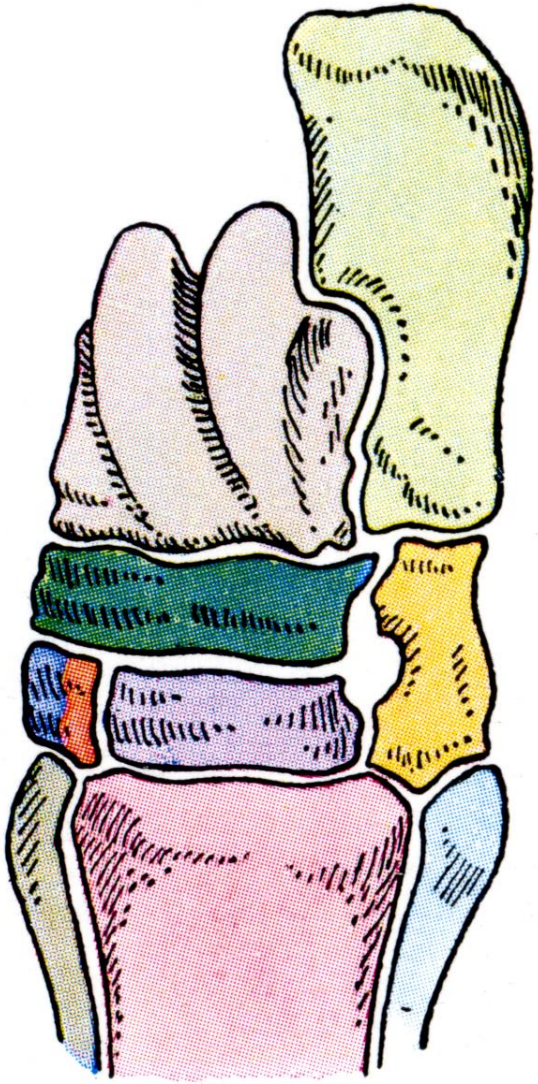
Flexors:

Gastro-cnemius, plantaris and popliteus.

The Tarsus

How many levels?

How many bones?



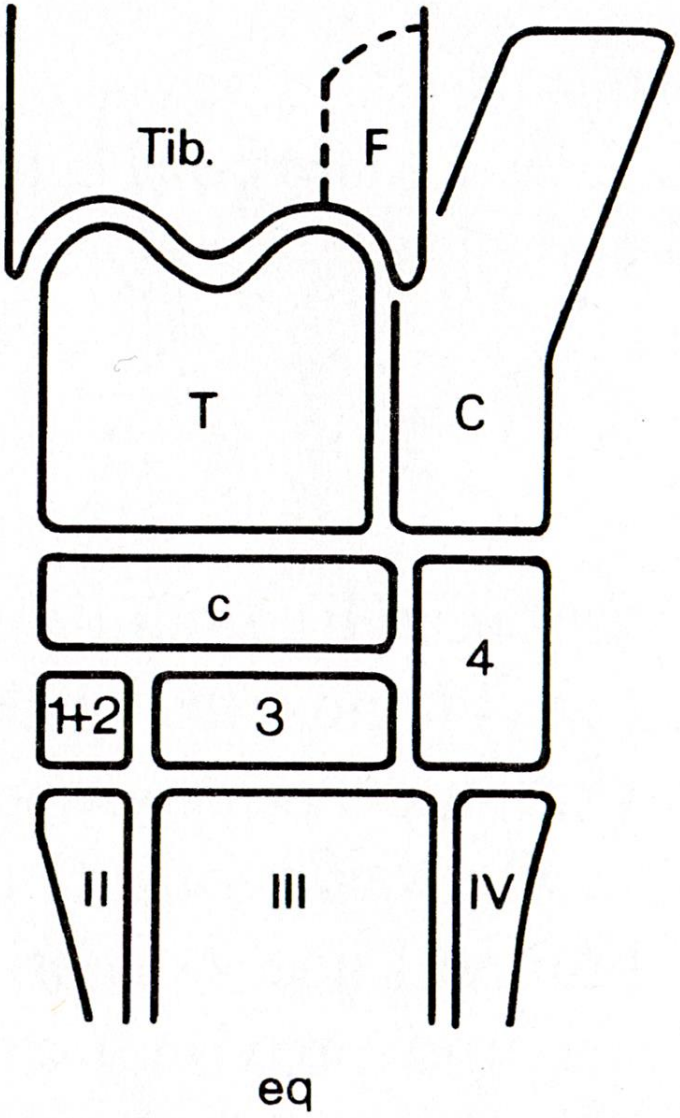


Fig. 198 (horse)

4- Tarsal (Hock) Joint

*** Type:** composite hing Joint.

*** Movement:** flexion & extension.

*** Articular surfaces: distal end of the tibia.**

*** Proximal raw**

1- Tibial tarsal bone (tallus)

2- Fibular tarsal bone (calcaneus)

*** Middle raw**

Central tarsal bone

*** Distal raw**

1- First + 2nd tarsal bones fused

2- 3rd tarsal bone

3- 4th tarsal bone

proximal articular surfaces of metatarsal bones.

The tarsal Joint formed of 3 Joints:

A- Tibio - tarsal articulation.

B- Inter-tarsal articulation (proximal and distal).

C- Tarso-metatarsal articulation.

Ligaments:

1, 2- medial & lateral collateral ligs. each of these ligs. consists of 2 parts long & short.

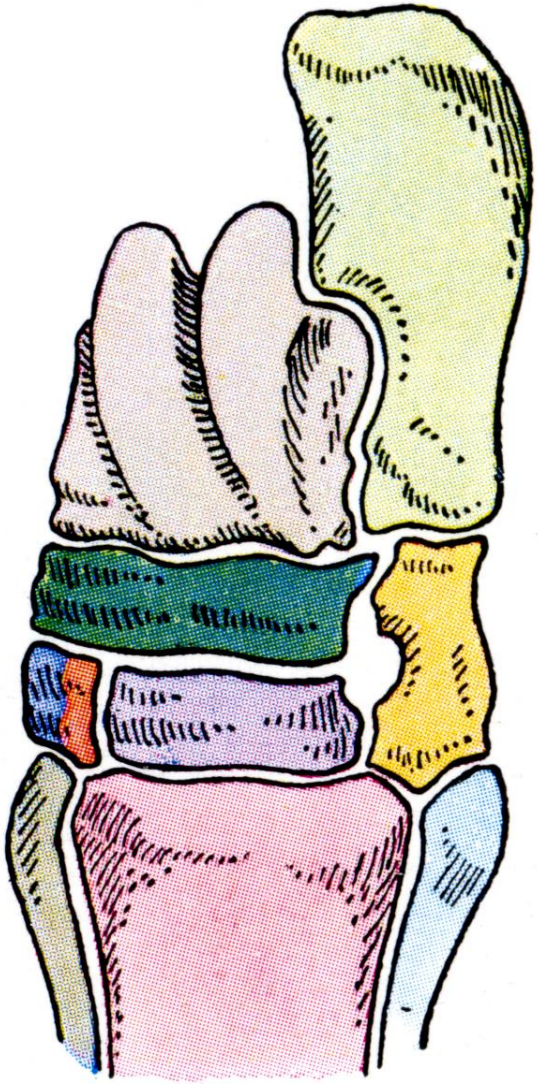
3- Plantar tarsal lig.

4- Dorsal tarsal lig.

The Tarsus

How many levels?

How many bones?



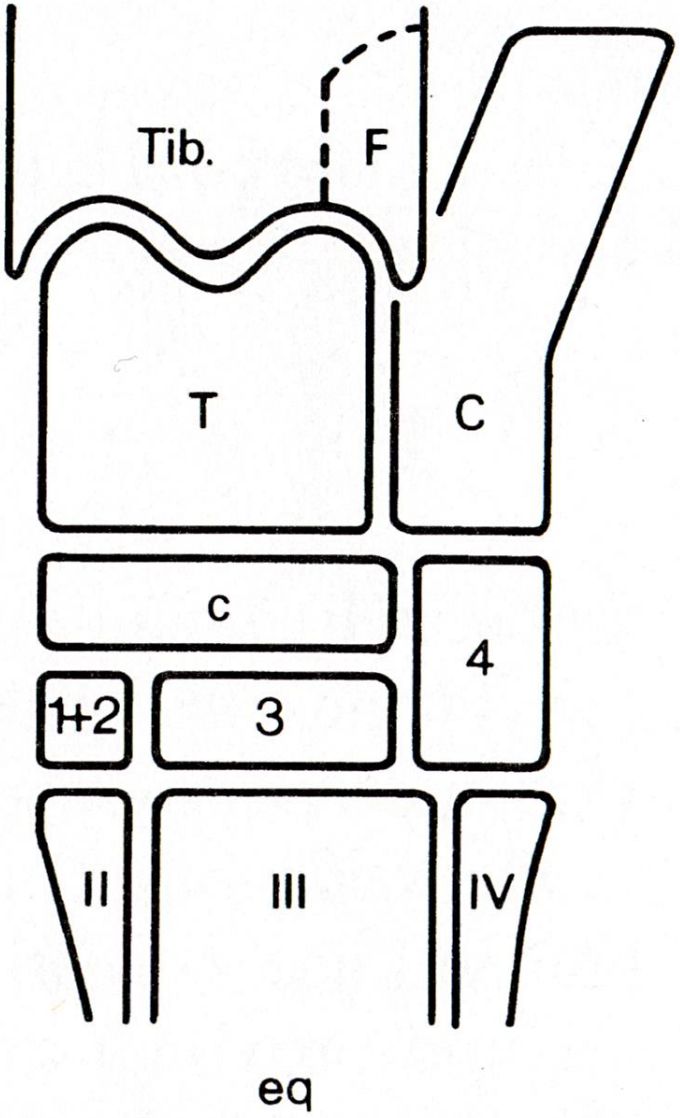


Fig. 198 (horse)

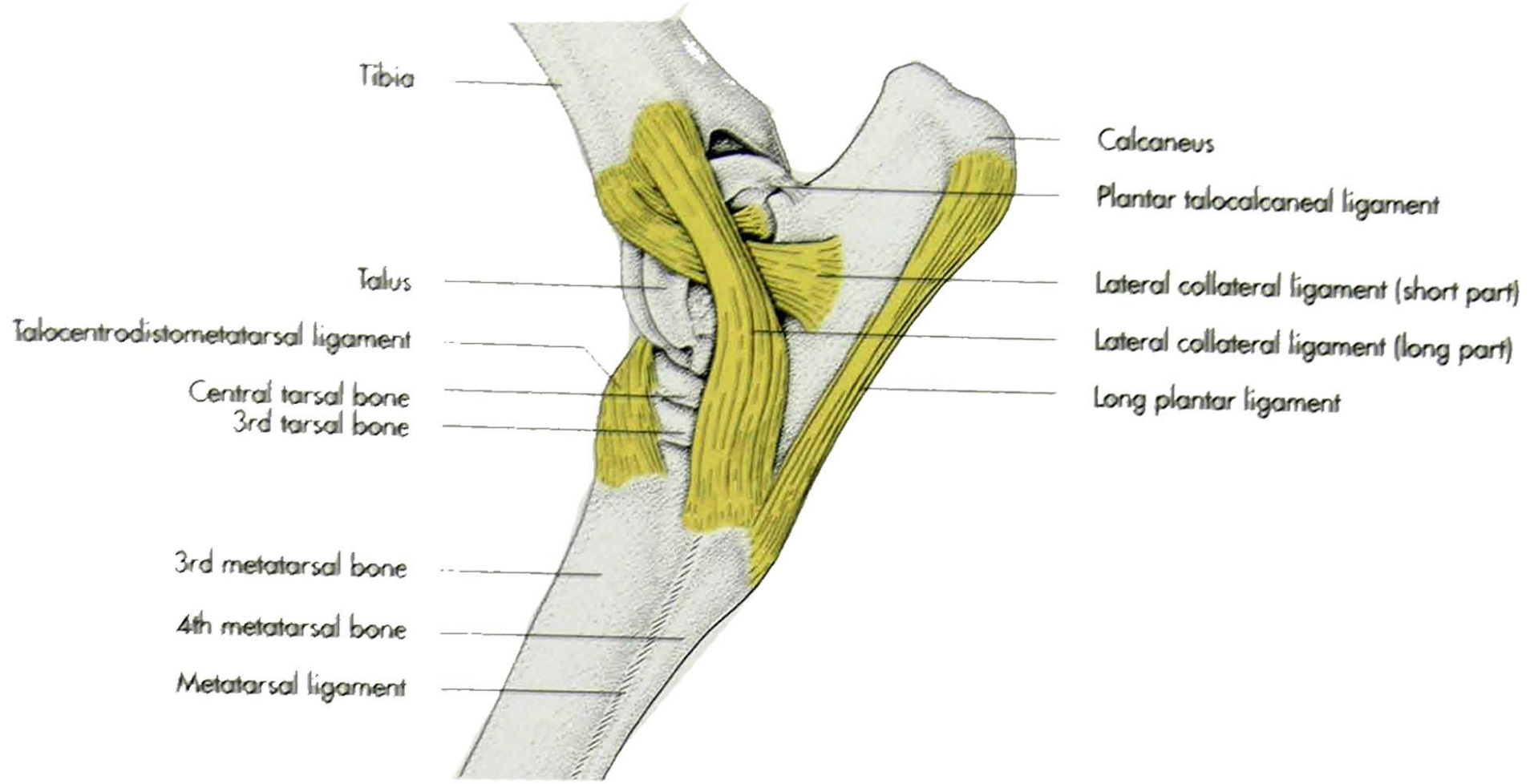


Fig. 4-66. Ligaments of the left tarsus of the horse (schematic, lateral aspect) (Červeny, 1980).

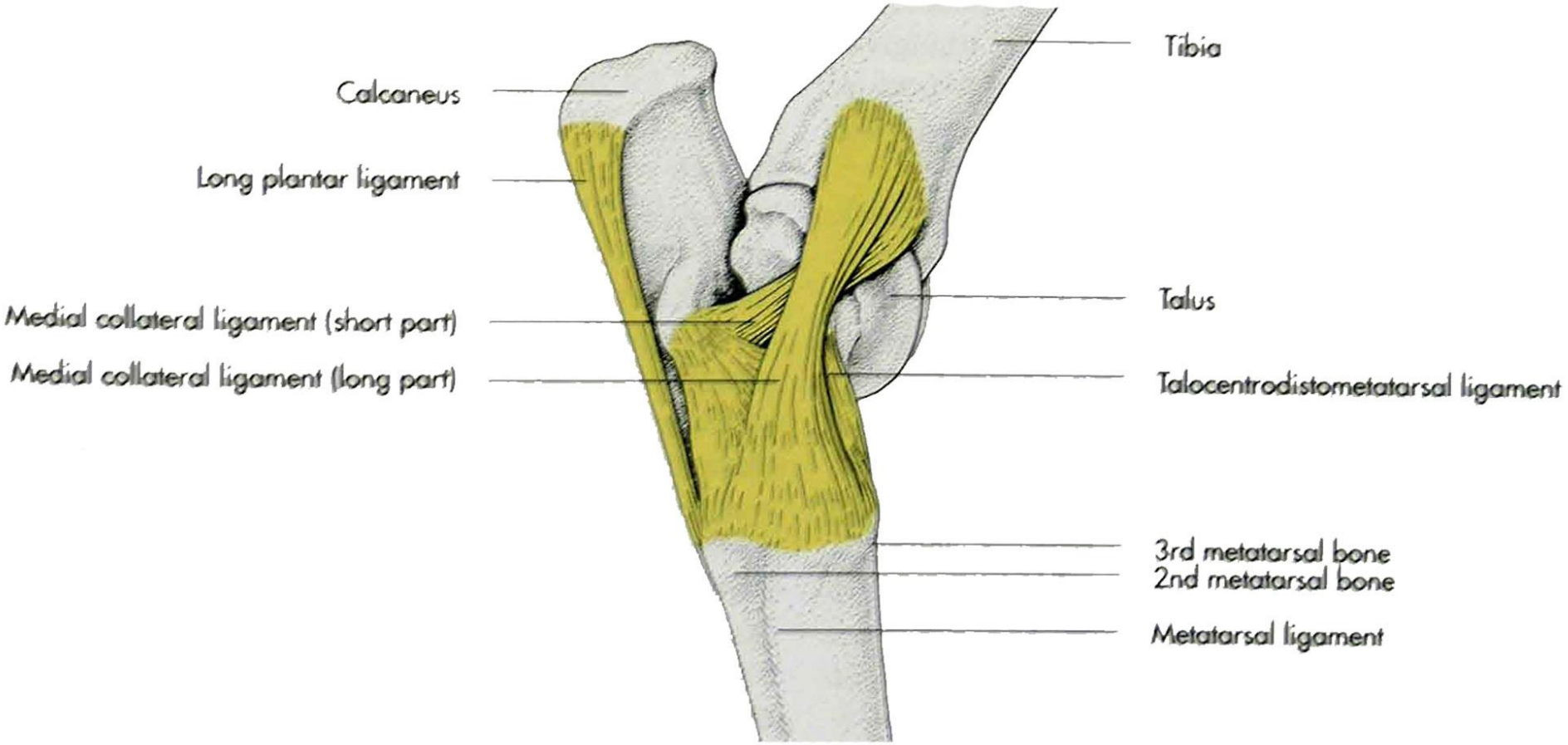
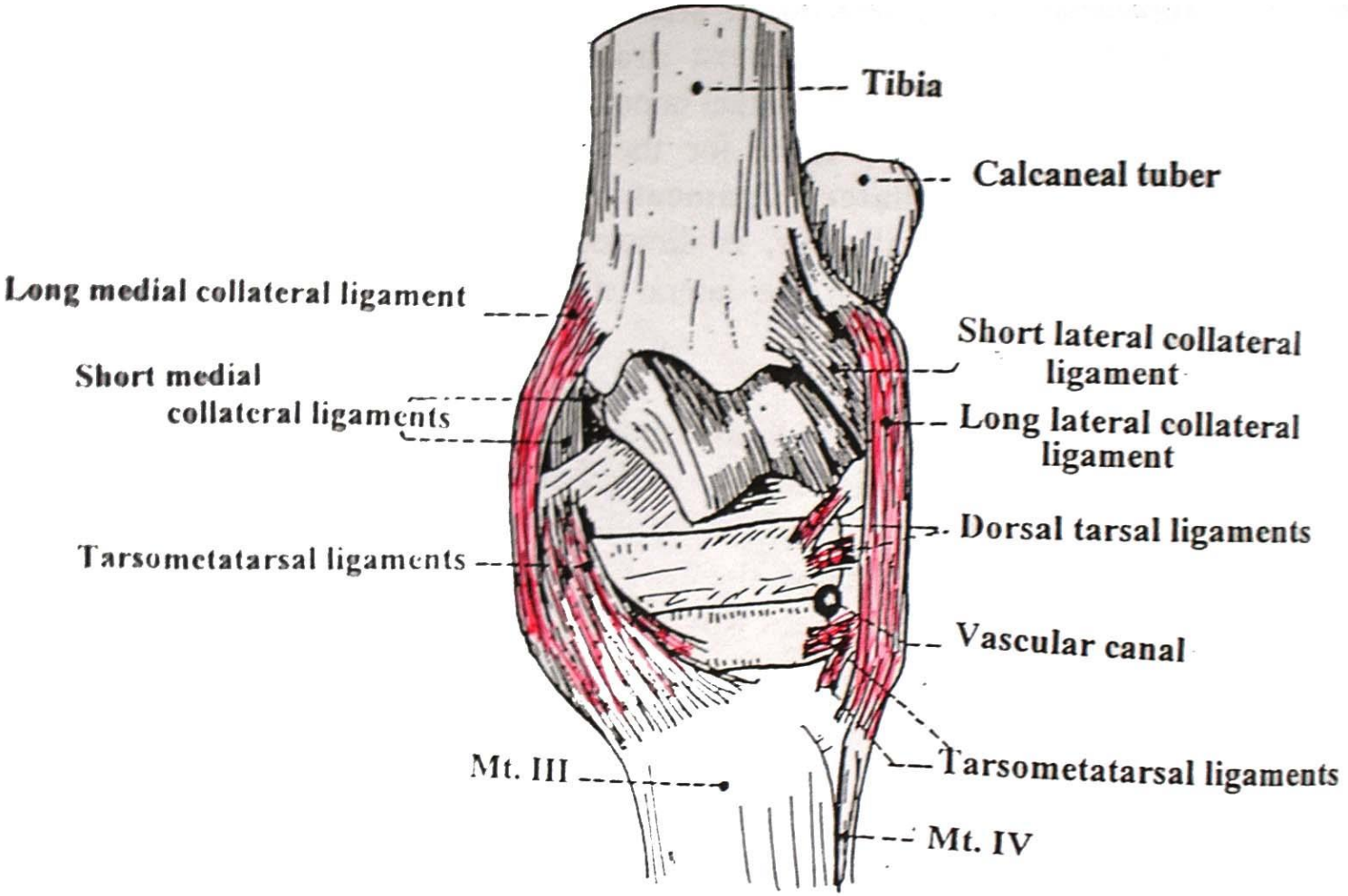


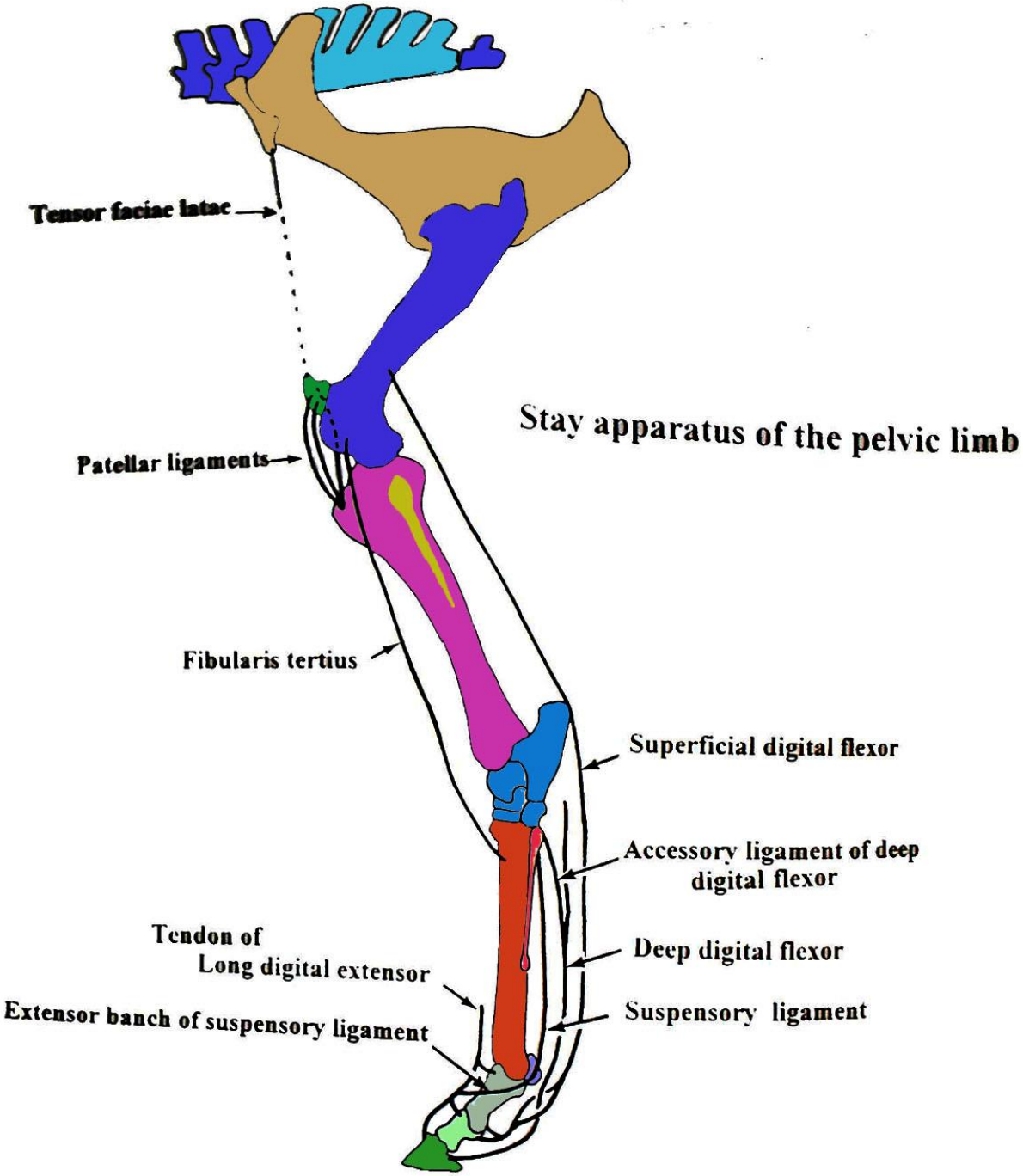
Fig. 4-67. Ligaments of the left tarsus of the horse (schematic, medial aspect) (Červeny, 1980).



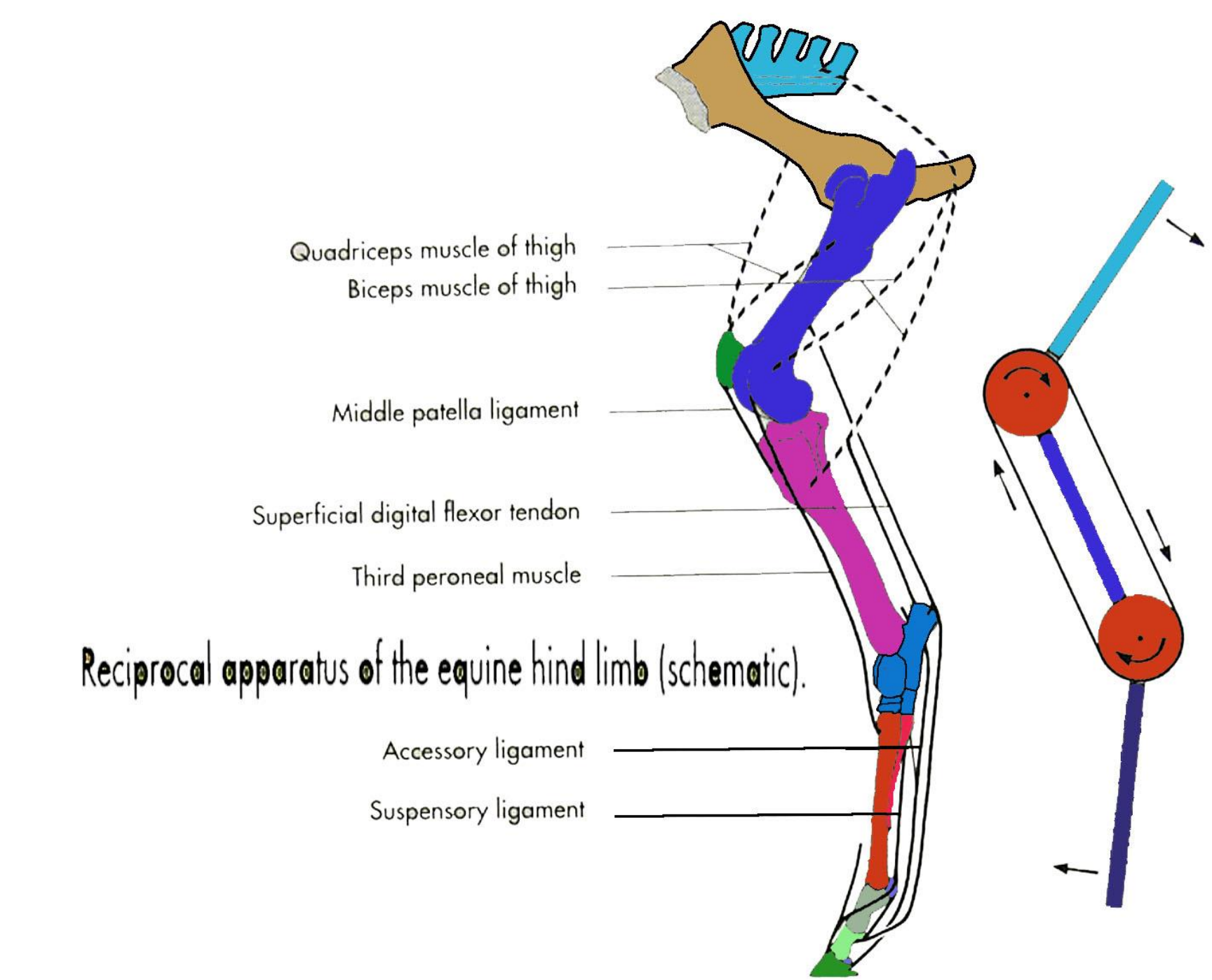
Tarsal joint

((stay apparatus of hind limb))

1Tensor Facialata
2-patellar ligaments
3-Fibularis tertius.
4-gastrocnemius.
5-Tendon of long digital extensor.
6-Superficial digital flexor tendon.
7-Deep digital flexor tendon and its accessory ligament.
8-Suspensory ligament and its extensor branch.
9 -Sesamoidean ligaments (prevent excessive hyperextension of the fetlock joint).



Stay apparatus of the pelvic limb



Reciprocal apparatus of the equine hind limb (schematic).