



Luxations

Luxations (dislocation) – closed joint trauma, where following the action of a traumatic agent, a permanent displacement is produced between the epiphyses which make up an articular complex

- Trauma to the peri- and intra-articular soft tissue also occurs



Luxations

Frequency

- More often with active adults, less frequent in children and the elderly
- More frequent in the upper limb (scapulo-humeral dislocation, interphalangeal dislocation, elbow dislocation)

Means of occurrence

- Direct
- Indirect
- More frequent in sports and work-related injuries, road accidents



Luxations

CLASSIFICATION

- By the age of the injury
 - ✓ Recent dislocation
 - ✓ Old dislocation
 - ✓ Recurring dislocation
- From a pathological anatomy standpoint
 - ✓ Displacement of healthy, normal joints
 - ✓ Displacement of pathological joint (subluxating dysplasia of the hip)



Luxations

COMPLICATIONS

- Nervous – more frequently compressions or elongations of the plexus
- Vascular
- Osseous (fissures, fractures)
- Tendinous or muscular interposition
- Muscular complications



Luxations

Clinical diagnosis

Based on subjective and objective clinical signs

- Pain
- Swelling, misshapen region
- Vicious position of the limb
- Functional disability



Luxations

TREATMENT

Early, since the luxation is an emergency

➤ *Recent dislocation*

- In most cases, solved by conservative, orthopedic treatment
- Reduction of the displacement, immobilization via cast, functional rehabilitation

➤ *Old and recurring dislocations*

- Surgical treatment



Acromio-clavicular disjunction

Youth, athletes

Work related, road accidents

Means of occurrence

- Direct: falling onto shoulder,
- Indirect: fall onto elbow,

Acromio-clavicular and coraco-clavicular ligaments may be affected

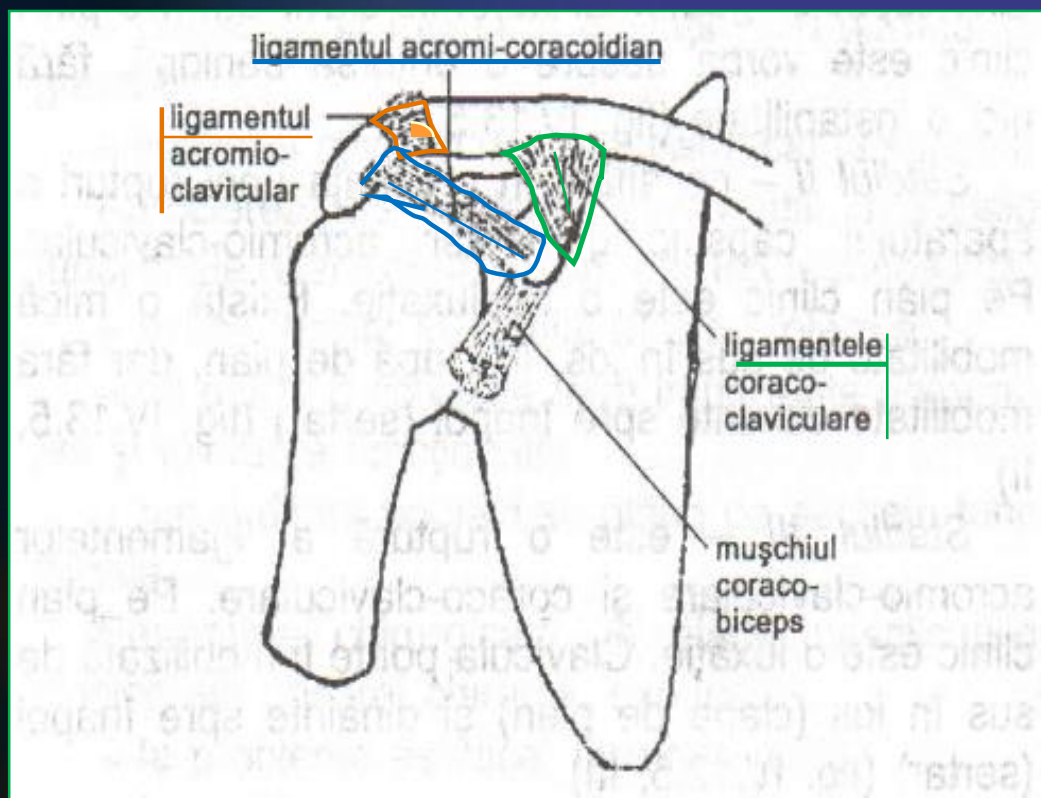


Fig. IV.13.4 – Ligamentele acromio-claviculare, acromio-coracoidian și coraco-claviculare.



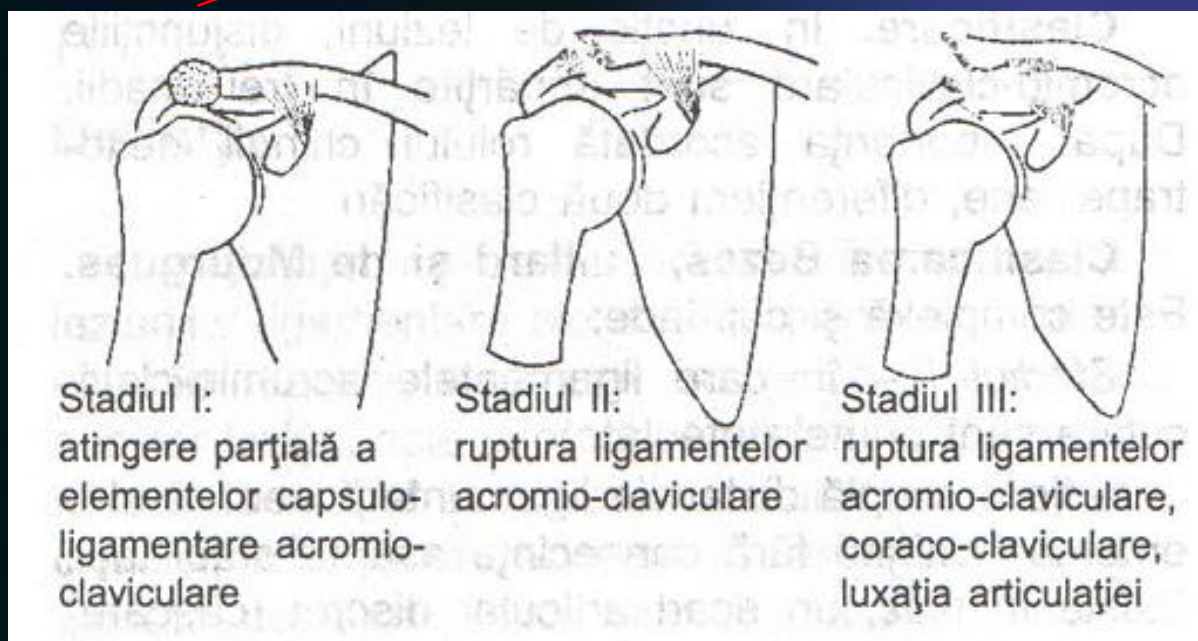
Classifications

Anatomo-pathological: Allman

1st degree – sprain – capsulo-ligamentary distension

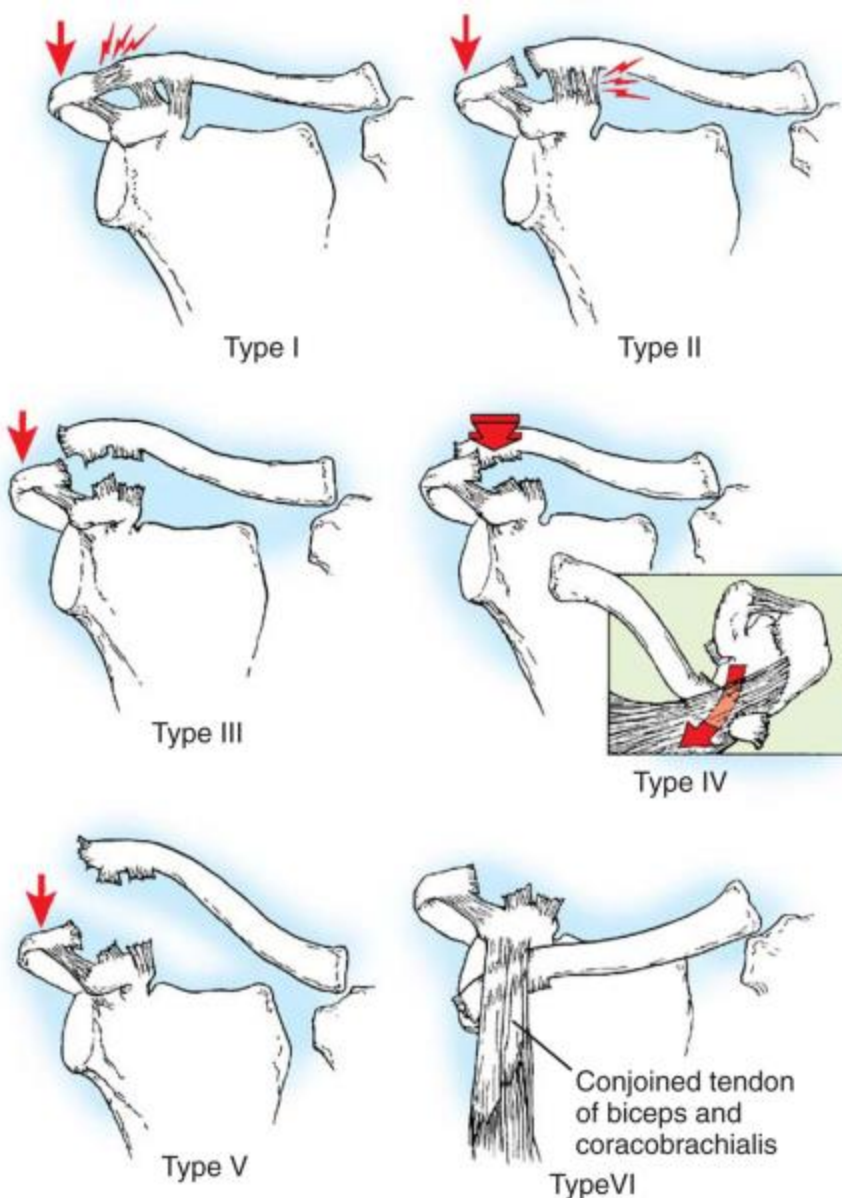
2nd degree – incomplete dislocation – acromio-clavicular ligaments torn, coraco-clavicular intact

3rd degree – complete dislocation – coraco-clavicular ligaments also torn, clavicle moves upward and outward



Classification by Rockwood – 6 degrees

- Type I as in Allman I
- Type II as in Allman II
- Type III as in Allman III
- Type IV both ligaments torn and external edge of clavicle moved towards posterior, in trapezius muscle
- Type V ligaments and muscle insertions torn, clavicle and acromion completely separated
- Type VI ligaments torn, external extremity of clavicle moved below coracoid process and posterior of biceps and coracobrachialis tendon





Clinical exam

Anamnesis – how did injury occur

- Inspection – comparative for both shoulders
 - Swelling of the joint
 - Prominence of the outer extremity of clavicle
 - Active movement possible but limited by pain
- Palpation
 - *Sign of the piano key*
 - *Sign of the antero-posterior drawer* for clavicle – the acromion is fixed and the clavicle moved forward and back



Clinical exam

Grade I:

Painful, normal mobility of the acromio-clavicular joint

- X-ray normal

Grade II:

- Pain is more intense
- Local tumefaction
- Sign of the piano key but not drawer
- X-ray: subluxation in P-A view

Grade III:

- Outer end of the clavicle bulging under skin
- Positive piano-key and drawer test
- X-ray: acromio-clavicular dislocation on front and side view



Radiological exam

- Frontal view
- Axial view
- Dynamic X-ray – frontal with weights in both hands



Treatment

- Gr I and II – orthopedic treatment
Desault cast 14 -21 days
- Gr III
surgical treatment



Scapulo-humeral displacement

Direct or indirect injury whereby the head of the humerus leaves its usual position in the glenoid cavity



Scapulo-humeral luxation

FREQUENCY

Most frequent displacement, due to:

- The scapulohumeral joint has large-amplitude movement in multiple directions
- There is a disproportion between articular surfaces: The surface of the glenoid cavity = $\frac{1}{3}$ of the surface of humeral head
- Weak ligamentary reinforcement



Scapulo-humeral luxation

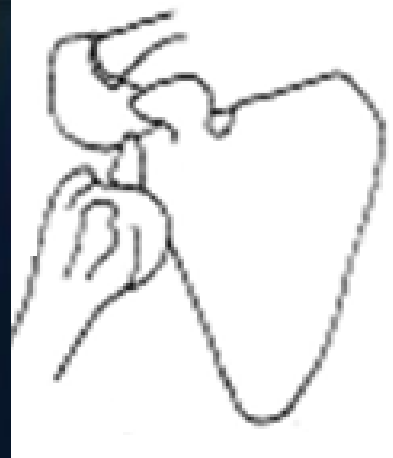
Anatomo-pathological classification

Depending on where the humeral head migrates:

- Anterior
- Posterior
- Inferior



↑
Normal
scapulo-
humeral joint



↑
Anterior
luxation



↑
Posterior
luxation



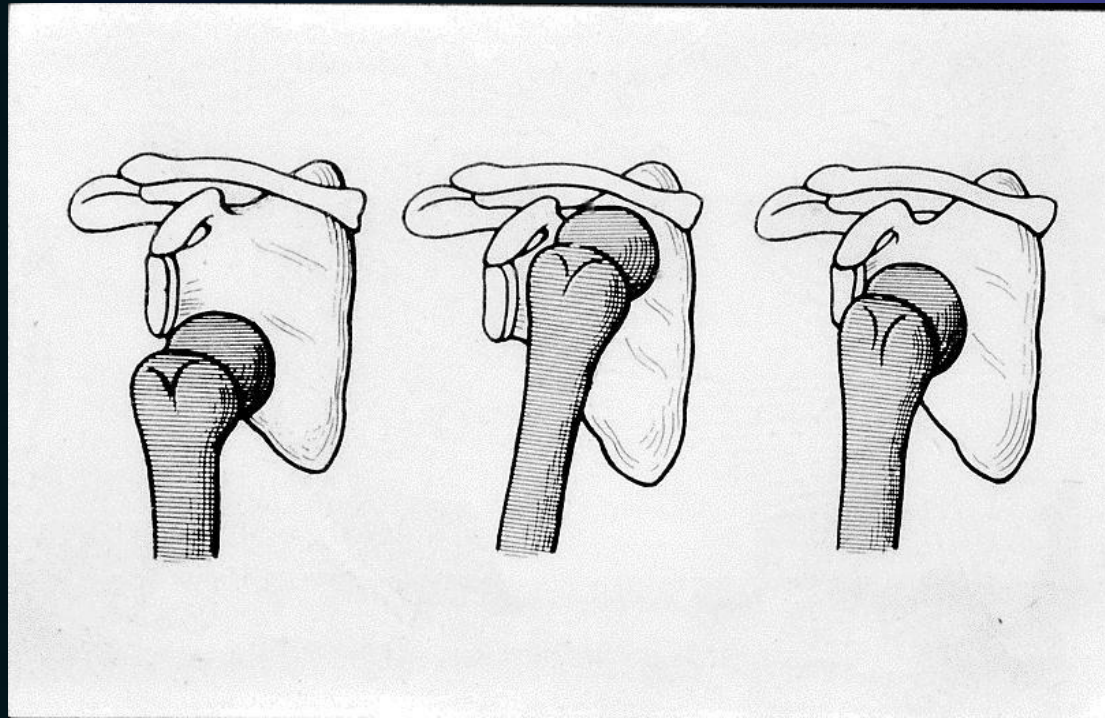
↑
Inferior
luxation

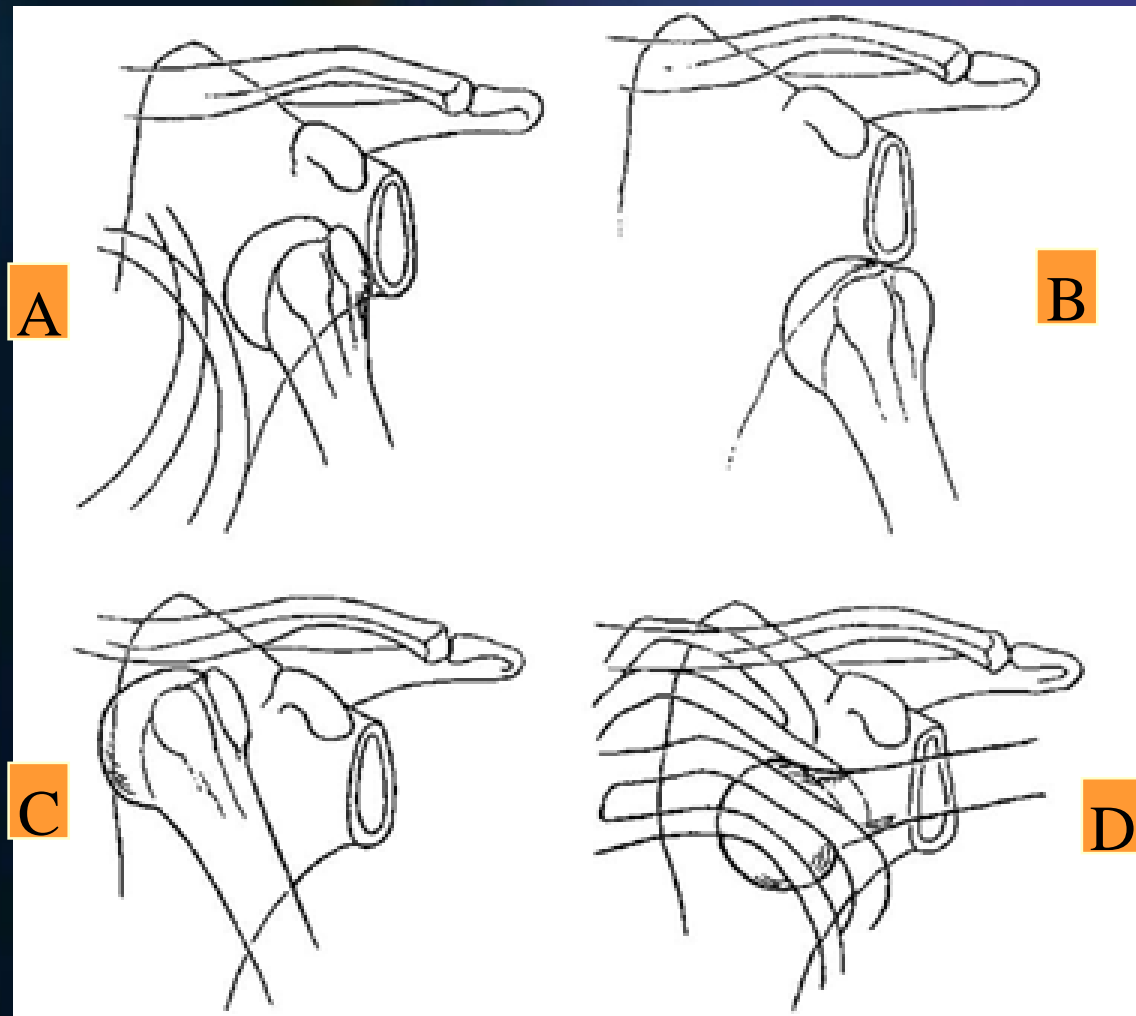


Scapulo-humeral luxation

Anterior luxation

- ✓ Subcoracoid variant – most frequent
- ✓ Extracoracoid variant
- ✓ Intracoracoid variant
- ✓ Subclavicular variant





- **A: subacromial; B: subglenoidian;**
- **C: subclavicular; D: intrathoracic.**



Scapulo-humeral luxation

Diagnosis

- Inspection
 - Dessault position



Fig.22. Poziția Dessault în care se prezintă accidentatul.

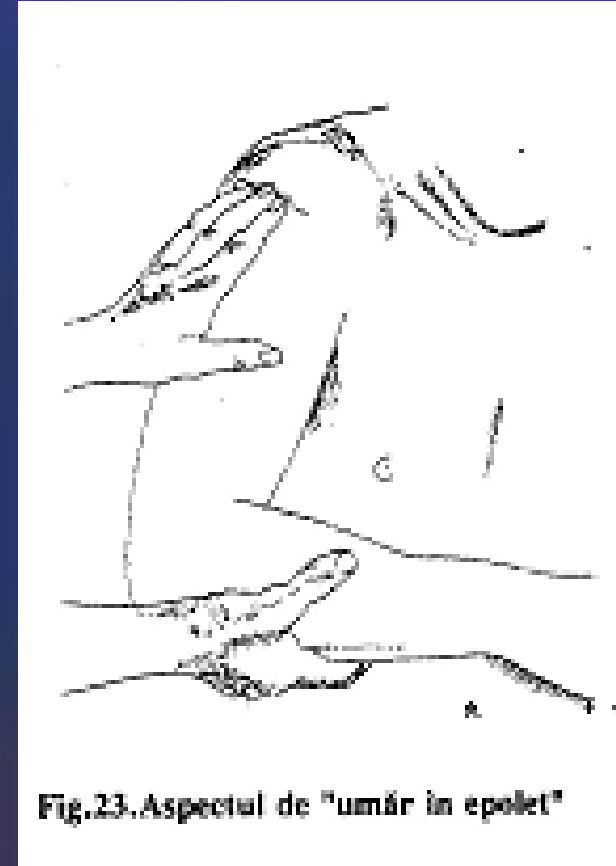


Scapulo-humeral luxation

Diagnosis

○ Inspection

- “epaulette shoulder”-
characteristic





○ **Inspection**

- Tumefaction and bruising of the shoulder
- Increased circumference of the arm – Hamilton's sign



- **Subcoracoid luxation** – arm in slight abduction and internal rotation
- **Extracoracoid luxation** – arm is in abduction and laterally rotated
- **Intracoracoid luxation** – arm in abduction, maximal internal rotation with forearm held against body
- **Subclavicular luxation** – arm in adduction, maximal internal rotation with forearm stuck against body
- **Posterior luxation** – arm rotated internally
- **Erect luxation** – arm in maximum abduction





Scapulo-humeral luxation

Diagnosis

o Palpation

- **Subcoracoid luxation** – humeral head below deltopectoral groove
- In other variants, humeral head can be felt outside the coracoid, inside it or subclavicular
- **Inferior luxations** – humeral head inside axilla
- **Posterior luxations** – humeral head posterior to the glena

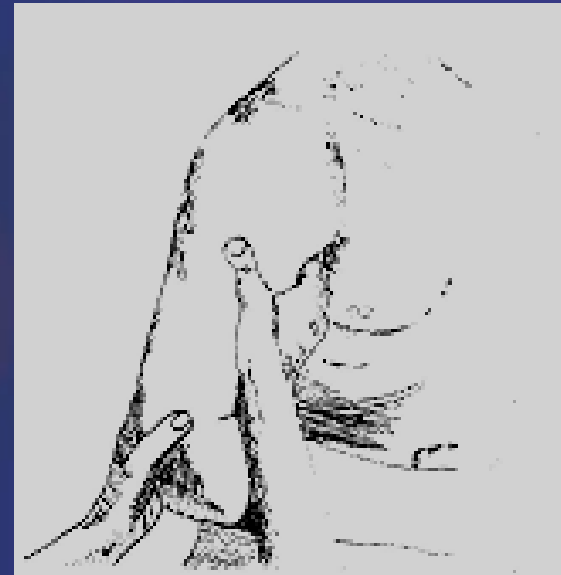


Fig.24. Palparea capului humeral luxat în axilă.



Scapulo-humeral luxation

Diagnosis

- In anterior dislocations, abduction is irreducible
- Upon attempting to reduce abduction, the arm returns to its initial position – sign of Berger



- Clinical exam must search for vascular and nervous complications

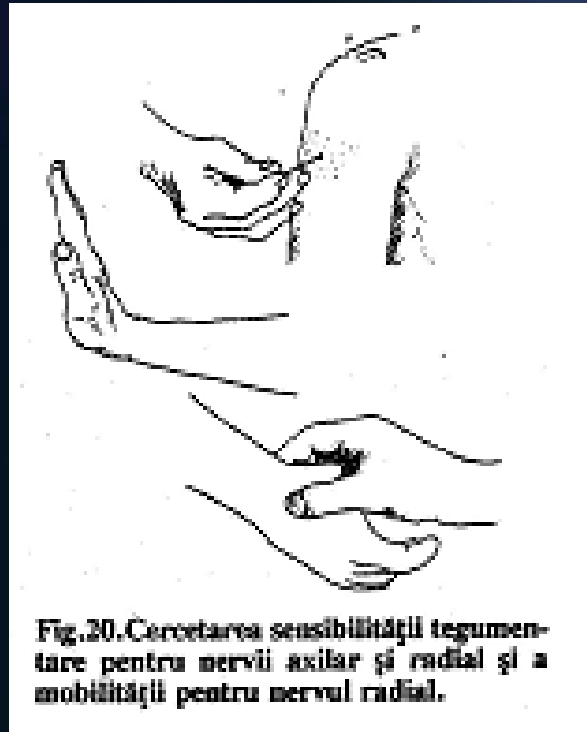


Fig.20. Cercetarea sensibilității tegumentare pentru nervii axilar și radial și a mobilității pentru nervul radial.



Scapulo-humeral luxation

Diagnosis

- Radiological exam
 - Frontal and axial view
 - Completes clinical exam and may reveal osseous complications

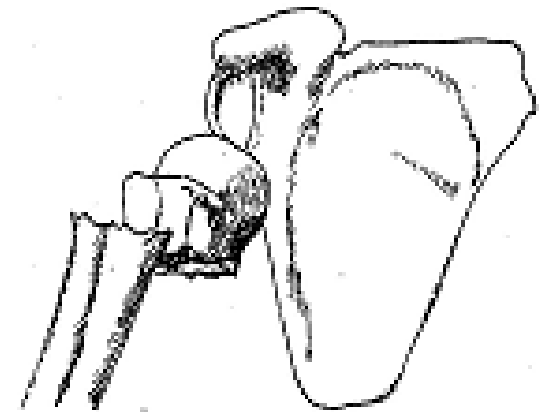


Fig.19. Fractură de col chirurgical al humerusului asociată luxației de umăr.



Scapulo-humeral luxation

Immediate Complications

- Association with a local fracture (humeral trochiter, surgical neck of humerus, glena, coracoid process)
- Nervous complications (ex: elongation of brachial plexus, paralysis of axillary or radial nerve)
- Vascular complications (injury to axillary vein or artery)
- Open luxation
- Muscular complications (rupture of muscles and tendons)



Scapulo-humeral luxation

Long-term Complications

- **Recurring and habitual displacements**
- **Scapulohumeral arthrosis**

It is considered that a neglected luxation, at 2 weeks old, can be reduced under anesthesia, while after one month orthopedic reduction is no longer possible



Scapulo-humeral luxation

TREATMENT

- **Luxations constitute traumatological emergencies**
- **Reduction must be accomplished as soon as possible**
- For optimal reduction conditions, it is necessary to anesthetize the patient (local or general)



Scapulo-humeral luxation

TREATMENT

❖ **ORTHOPEDIC**

Methods of reducing shoulder luxation

- I. Metoda Hipocrate
- II. Metoda Von Artl
- III. Metoda Mothes
- IV. Metoda Kocher
- V. Clotteau E. L. si colab



Hippocrates method

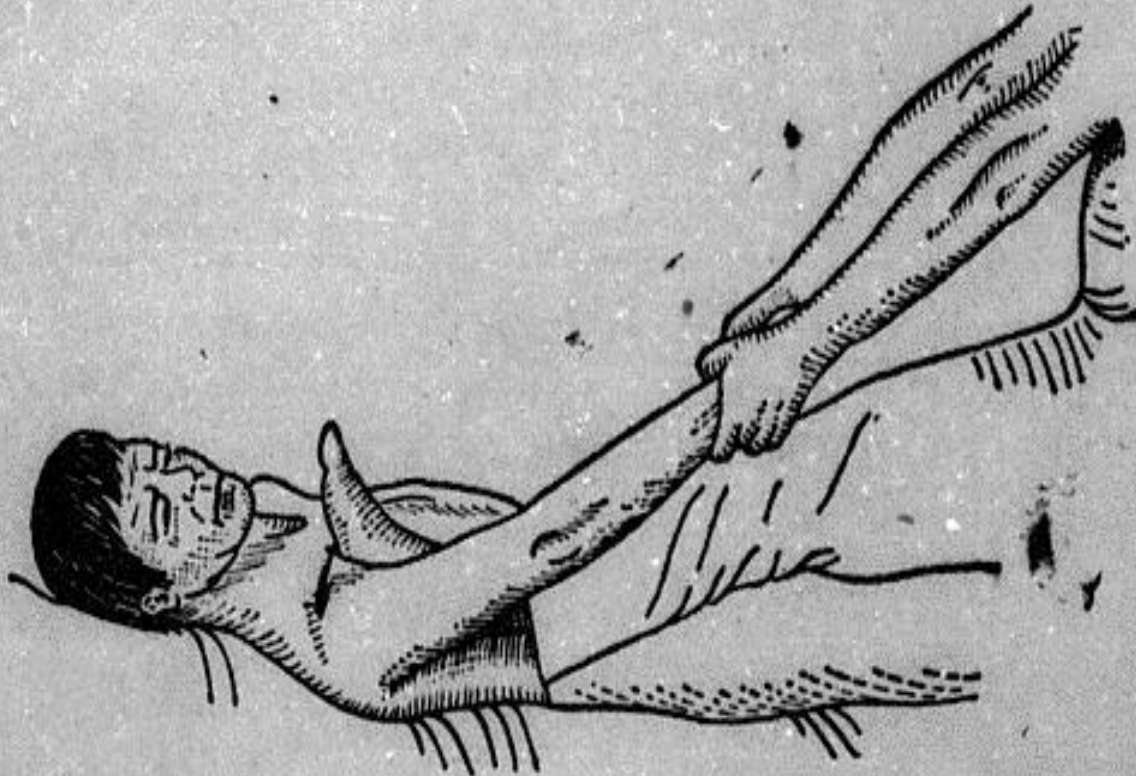


Fig. 10-13 — Metoda Hipocrate de repunere a luxației de umăr (după Böhler).

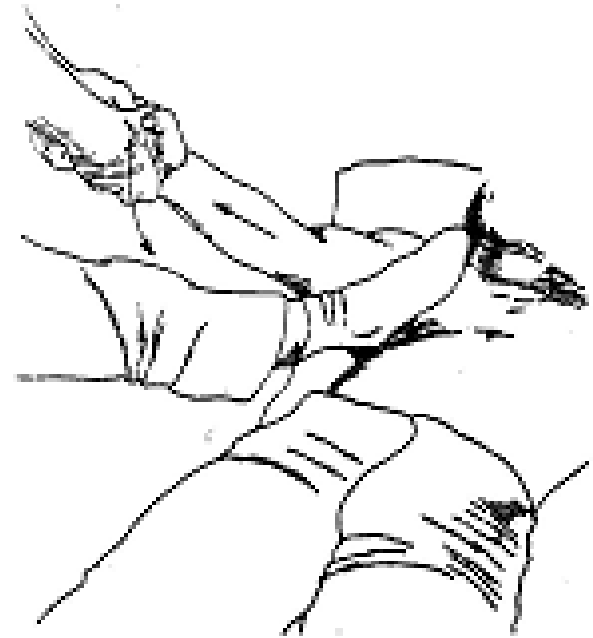


Fig.25.Metoda Hipocrate.

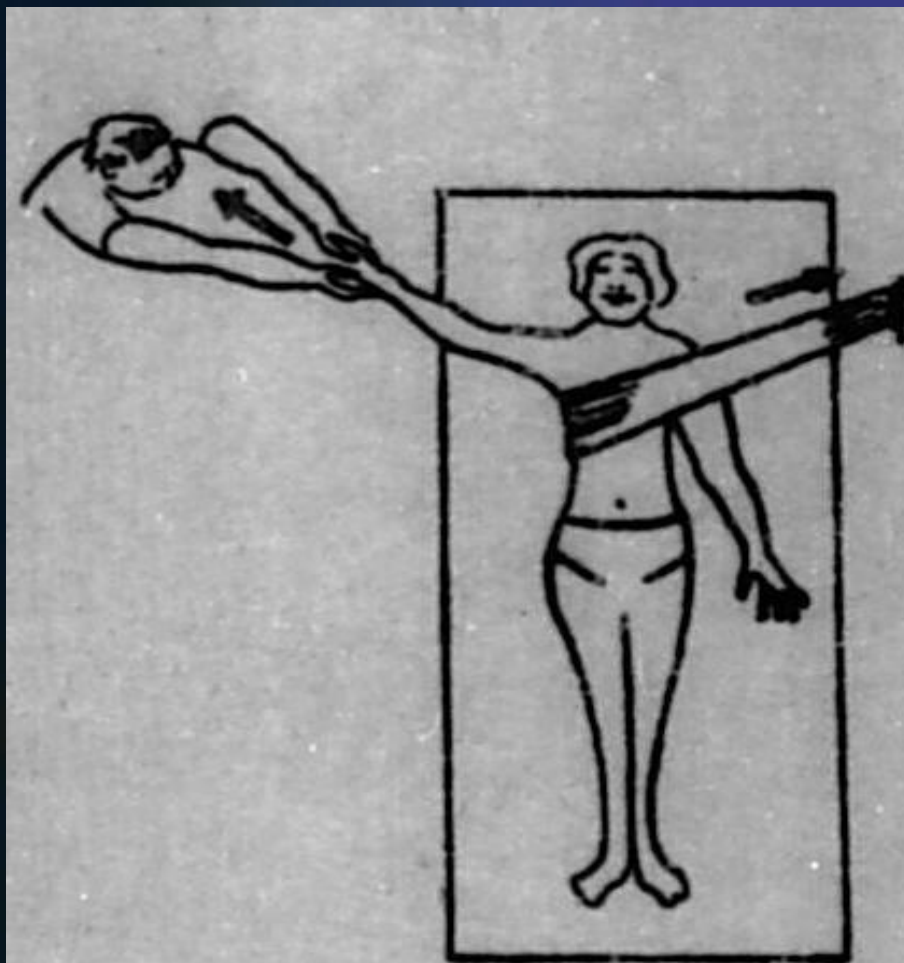


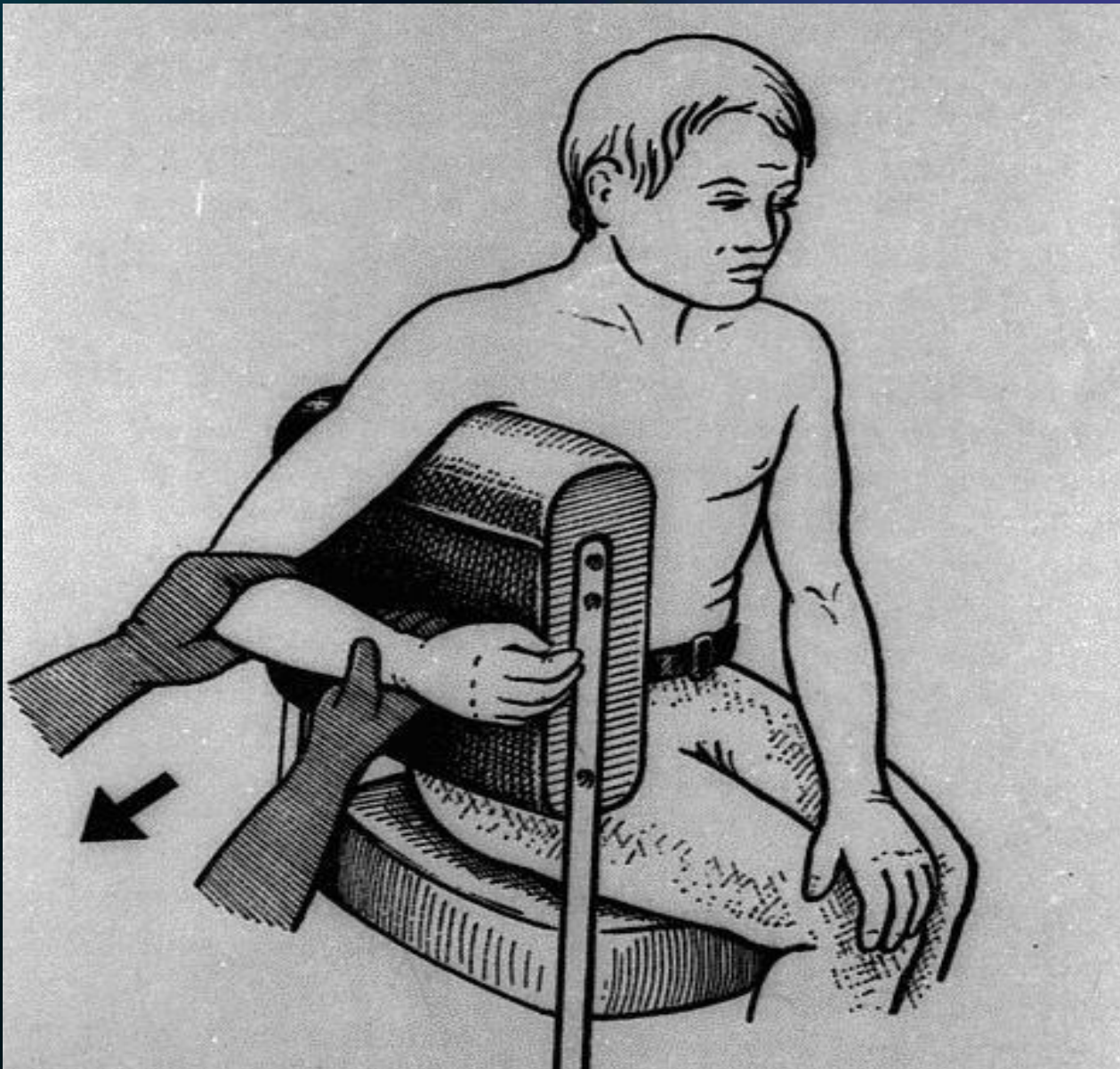
Mothes Method

Continuous traction with counterextension, the limb being abducted at 110-120° and extended



Fig.26. Metoda Mothes.





Metoda Von Artl

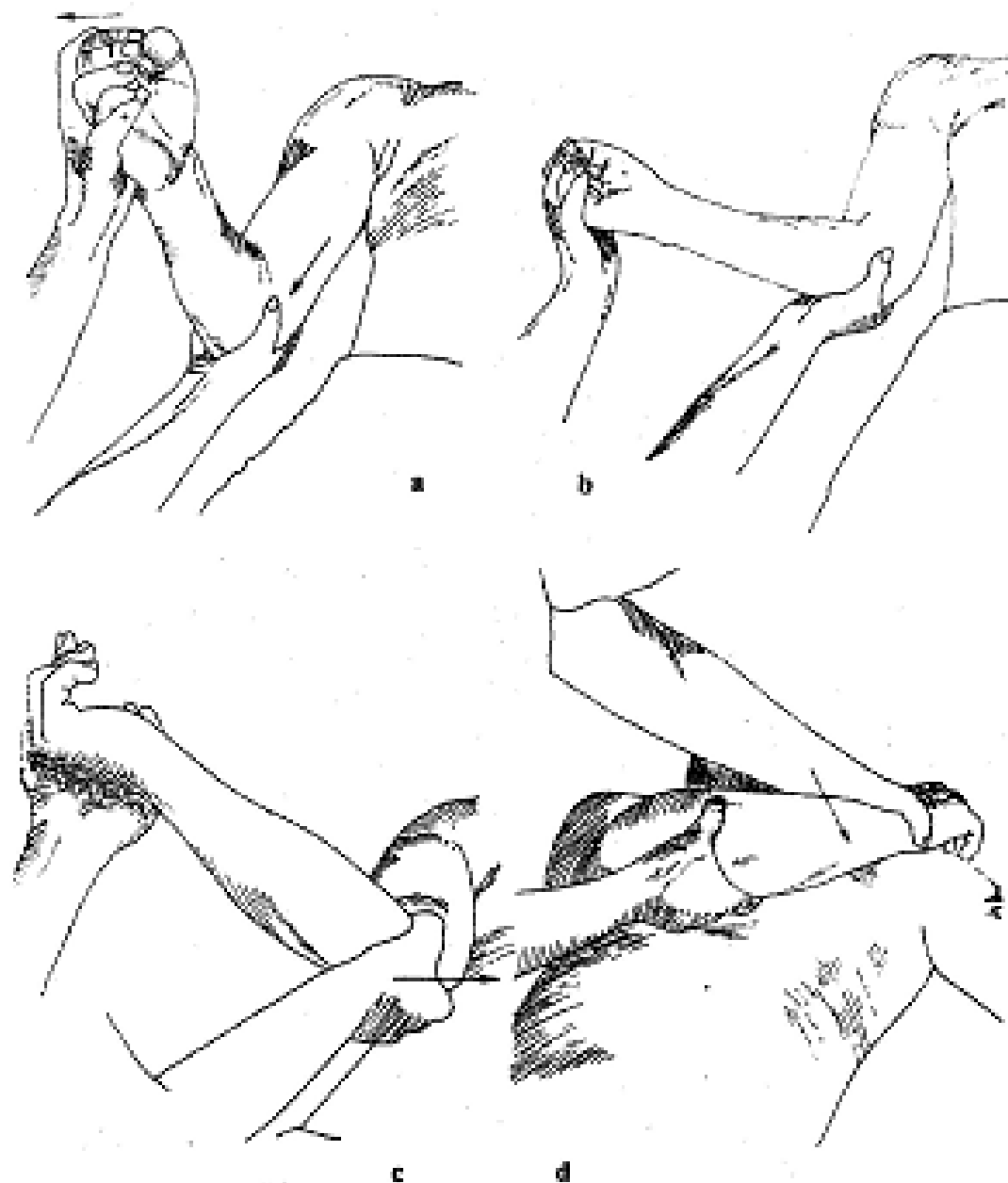


Fig.27. Metoda Kocher.



Scapulo-humeral luxation

TREATMENT

- After reduction – immobilization in toraco-brachial cast
- Maintain cast 21 days
- After removing immobilization, progressively restart active movements and begin physical rehabilitation

❖ **SURGICAL**

Luxations that cannot be reduced orthopaedically may benefit from surgical treatment

For intervertebral, irreducible luxations – open reduction



Luxation of the Elbow

FREQUENCY

Second to scapulohumeral displacement

ANATOMOCLINICAL FORMS

- **Anterior displacement**
- **Posterior displacement** – the most frequent:
 - ✓ Postero – external
 - ✓ Postero – internal

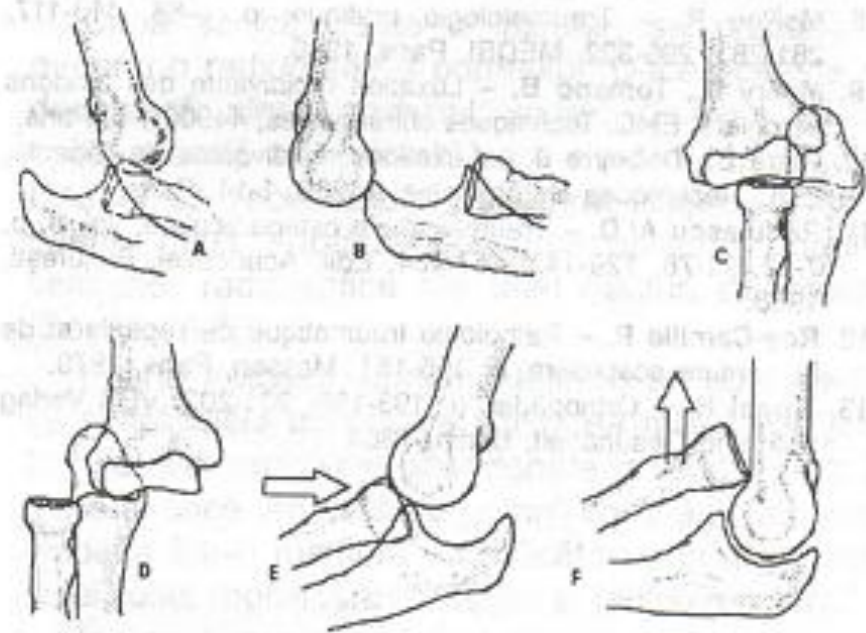


Fig. IV.13.67 – Luxație traumatică de cot. A, posteroară; B, anteroară; C, ulnară; D, radială; E, și F. Mecanismul de luxare a capului radial.



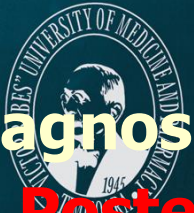
Means of occurrence

- In most cases indirect, through falling onto hyperextended elbow



- Rarely direct

Luxation of the Elbow



Diagnosis

Posterior Elbow Dislocation

Symptoms are characteristic:

- *Intense pain* of the elbow area, increased by attempts at movement or palpation

Inspection

- Patient position: forearm held by the healthy hand, elbow flexed at 120, forearm in pronation
- Globulous, deformed elbow
- Affected arm appears shorter
- Ecchymoses
- Olecranon deviated towards posterior, jutting outward

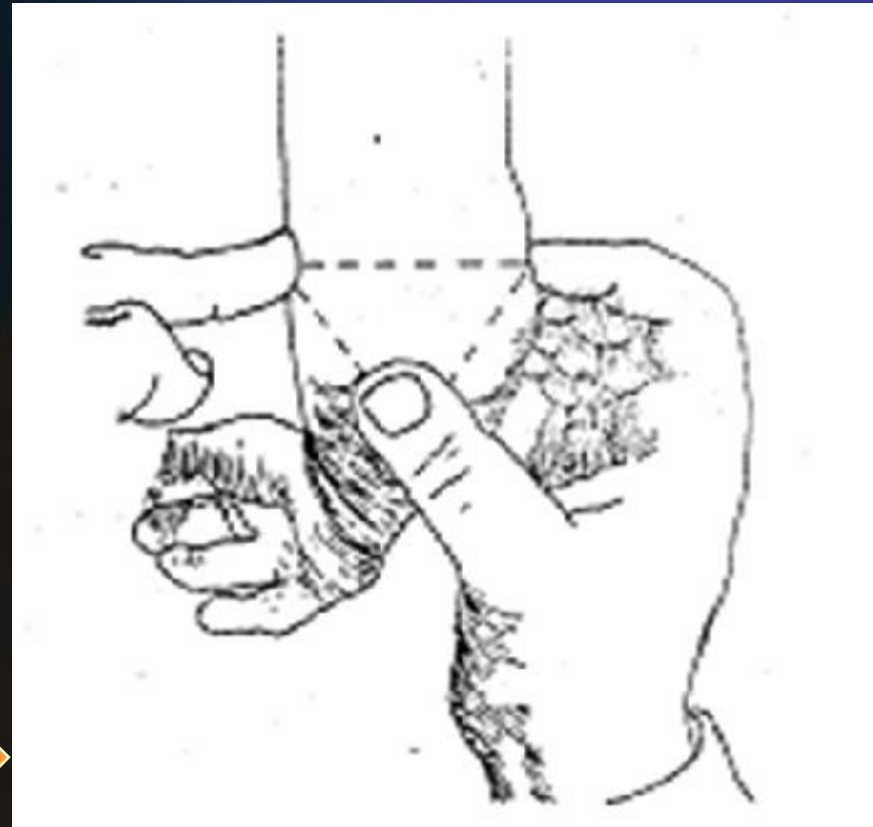




Posterior elbow dislocation

- Nelaton's triangle reversed
- In postero-internal dislocation, the inner side of Nelato's triangle is smaller

Nelaton's triangle – normal aspect





Luxation of the Elbow

Posterior elbow dislocation

Diagnosis

- Active movement greatly diminished
- Passive movement:
 - ✓ *Extension, pronation, supination* - nearly normal limits
 - ✓ *Flexion* – elastic resistance



Luxation of the Elbow

Diagnosis

Anterior elbow luxation

- Rare, in most cases following olecranon fracture
- Clinically, presents:
 - ✓ Elbow *flexed* greatly
 - ✓ Arm is *shortened*
 - ✓ Forearm is *lengthened*
 - ✓ Inside the elbow crease, the coronoid process of the ulna and radius head can be felt



Luxation of the Elbow

DIFFERENTIAL Diagnosis

- Supracondylar humerus fracture
- Monteggia-Stanciulescu displacement fracture



Luxation of the Elbow

COMPLICATIONS

➤ Immediate:

- ✓ Open dislocation
- ✓ Cubital nerve lesion
- ✓ Biceps and coracobrachialis lesion
- ✓ Interposition of soft tissue
- ✓ Vascular lesions - rare

➤ Long-term:

- ✓ Heterotopic ossification
- ✓ Elbow rigidity



Luxation of the Elbow

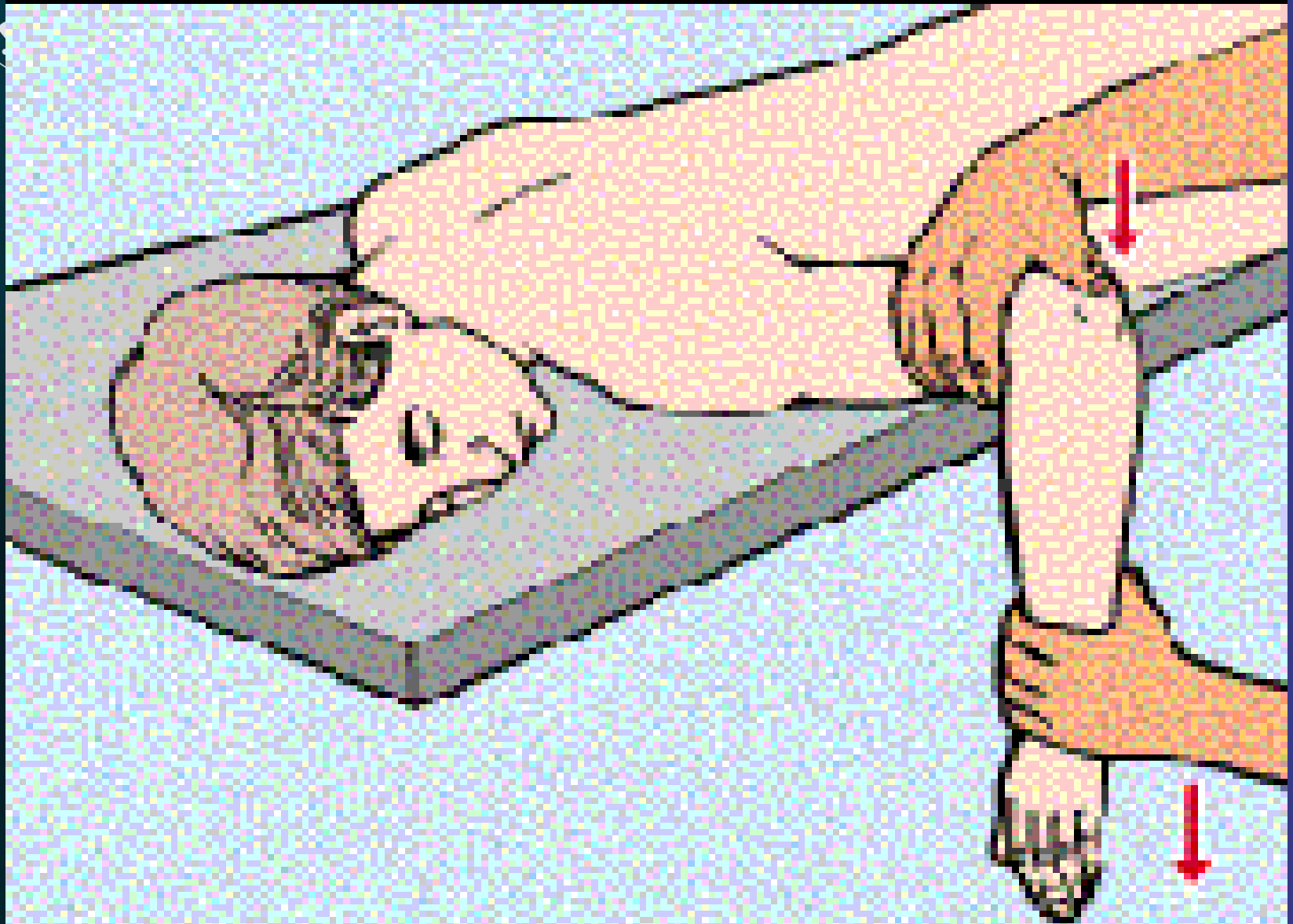
TREATMENT

- **Reduction must be accomplished as soon as possible**
- For optimal reduction conditions, patient must be sedated, muscles relaxed

Technique:

- Patient in dorsal decubitus at the edge of the bed

PROCEDURE

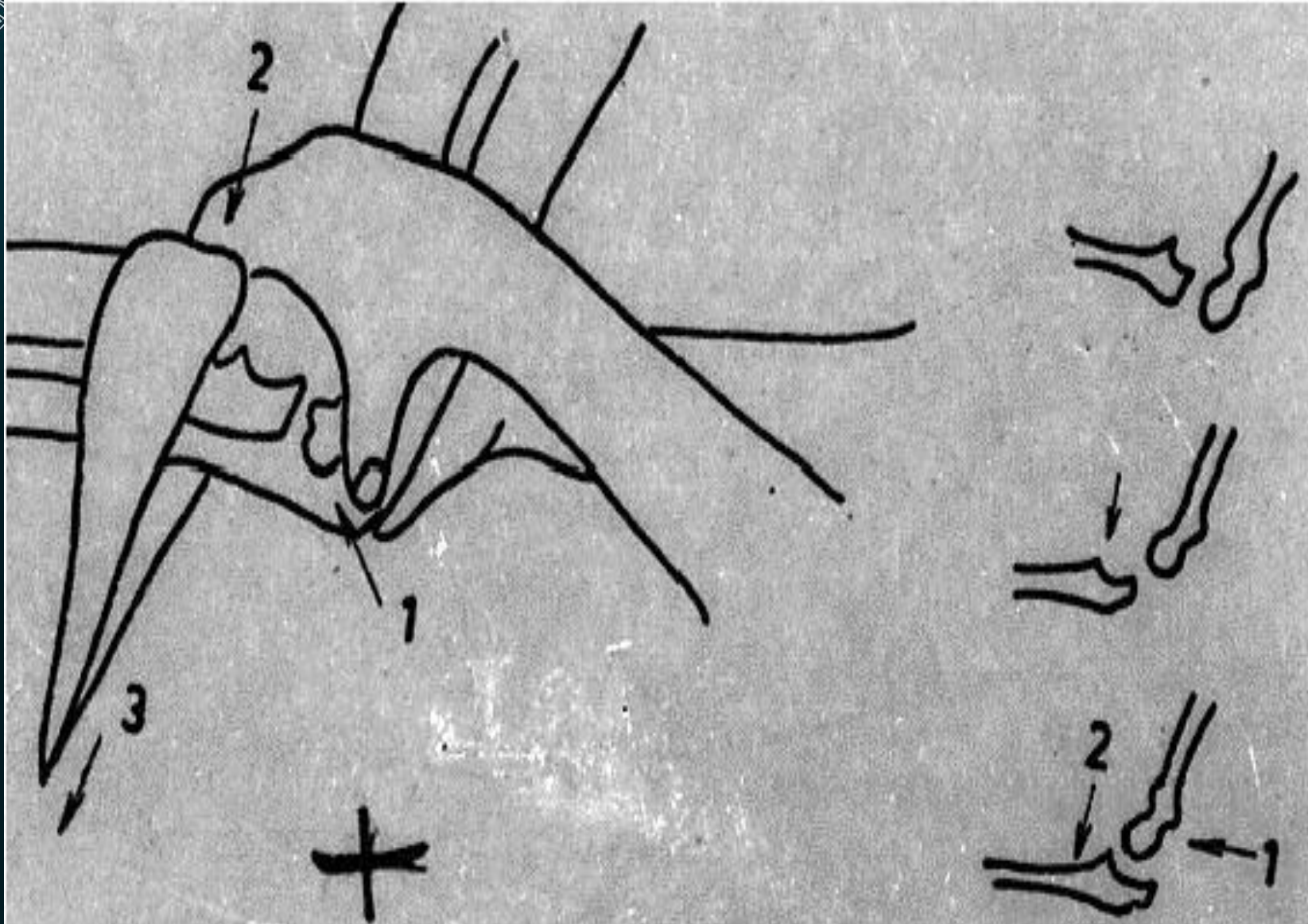




Extension in the axis of the arm and forearm

Counterextension of the arm

Olecranon is replaced using both thumbs





- Anterior luxation:
- Extension on flexed forearm
- Counterextension in the axilla
- Forearm is extended and using the thumb the olecranon is pushed underneath the distal humerus and then replaced
- Non-reducible dislocations – surgical treatment



- After reduction, immobilization for 14 days
- After removal of cast, physical rehabilitation



Coxofemural Luxations

Permanent displacement of the femur head around the cotyloid cavity, following a traumatic injury

- Rarely encountered
- Usually appear after important trauma
- Possibility of severe long-term complications



Coxofemural Luxations

MEANS OF OCCURRENCE

- Most frequently, the traumatic agent acts on the knee, the thigh being *flexed and adducted* (car accidents)
- When lower limb is in other positions, dislocation is associated with fractures



Coxofemural Luxations

CLASSIFICATION

By the position of femur head

1. REGULAR LUXATIONS

➤ **Posterior luxations**

- ✓ High or iliac
- ✓ Low or ischiatic

➤ **Anterior luxations**

- ✓ High or pubic
- ✓ Low or obturatory



Coxofemural Luxations

CLASIFICARE

2. IRREGULAR LUXATIONS

- Subcotyloid luxations
- Supracotyloid luxations
- Associations may also appear: fracture-luxations: luxation with cotyl or more rarely, femoral head fracture



Coxofemural Luxations

Diagnosis

Anamnesis:

- Circumstances of accident

Clinical Examen

- Pain
- Function disability
- Vicious position
- Palpation – cotyloid cavity feels empty, femur head distanced from it

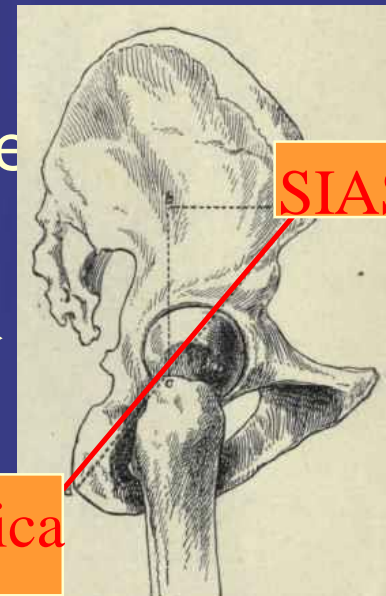


Diagnosis

Characteristic signs:

- Iliac luxation

- thigh – slight internal rotation, *adduction*, *moderate flexion*
- Kness overlap
- Foot placed on top of the other
- Lower limb shortened, greater trochanter above the Roser-Nelaton line
- Femoral head in the external iliac fossa



Tuberozitate ischiatica



Coxofemural Luxations

Diagnosis

Characteristic signs:

- Ischiatic luxation

- Thigh is flexed, adducted and internally rotated
- Femoral head above ischion
- Somewhat shortened





Coxofemural Luxations

Diagnosis

Characteristic signs:

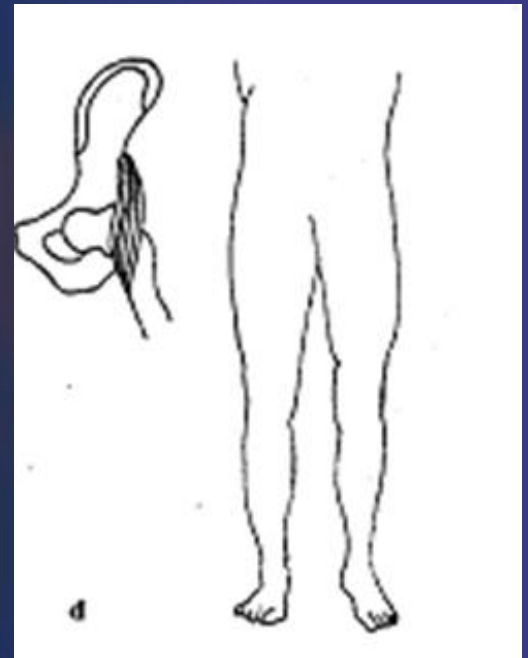
- Obturator luxation
 - Thigh is flexed, abducted and externally rotated





■ Pubic luxation

- Lower limb extended
- Foot externally rotated
- Femoral head under crural arcade
- Trochanter migrates medially





- Pelvis X-ray confirms diagnosis and may reveal associated fractures



Coxofemural Luxations

COMPLICATIONS

- General – traumatic shock
- Local:
 - ✓ Vascular:
 - Compression of femoral or obturator vessels in anterior forms
 - ✓ Nervous:
 - Paralysis of the sciatic – in posterior forms
 - Crural paralysis – in anterior forms
 - ✓ Visceral:
 - Bladder lesions in pubic forms



Coxofemural Luxations

COMPLICATIONS

- ✓ Luxations associated with region fractures
 - ✓ Frequently fracture of cotyloid brow?
 - More severe – fracture of posterior acetabulum wall – luxation unstable after reduction
 - Can be associated with avulsion fracture of femoral head, which upon reduction can lead to femoral neck fracture
 - Can be associated directly with femoral neck fracture
 - Polytrauma association, when coxofemural luxation must be recognized



Coxofemural Luxations

COMPLICATIONS

- Long-term
 - ✓ Necrosis of the femur head, mostly partial, polar superior
 - ❖ It happens late, requires radiological supervision
 - ✓ Secondary coxarthrosis ± femur head necrosis
 - ✓ Periarticular ossifications, which give hip rigidity



Coxofemural Luxations

TREATMENT

- Emergency
 - Immobilisation of the injury
 - Combatting shock trauma
 - Sedation
 - Transportation to specialty services



Coxofemural Luxations

TREATMENT

- Emergency reduction, under general anaesthetic
- If it cannot be done orthopedically, resort to open reduction
- If associated with sciatic paralysis, accomplish reduction first, neurosurgical intervention later

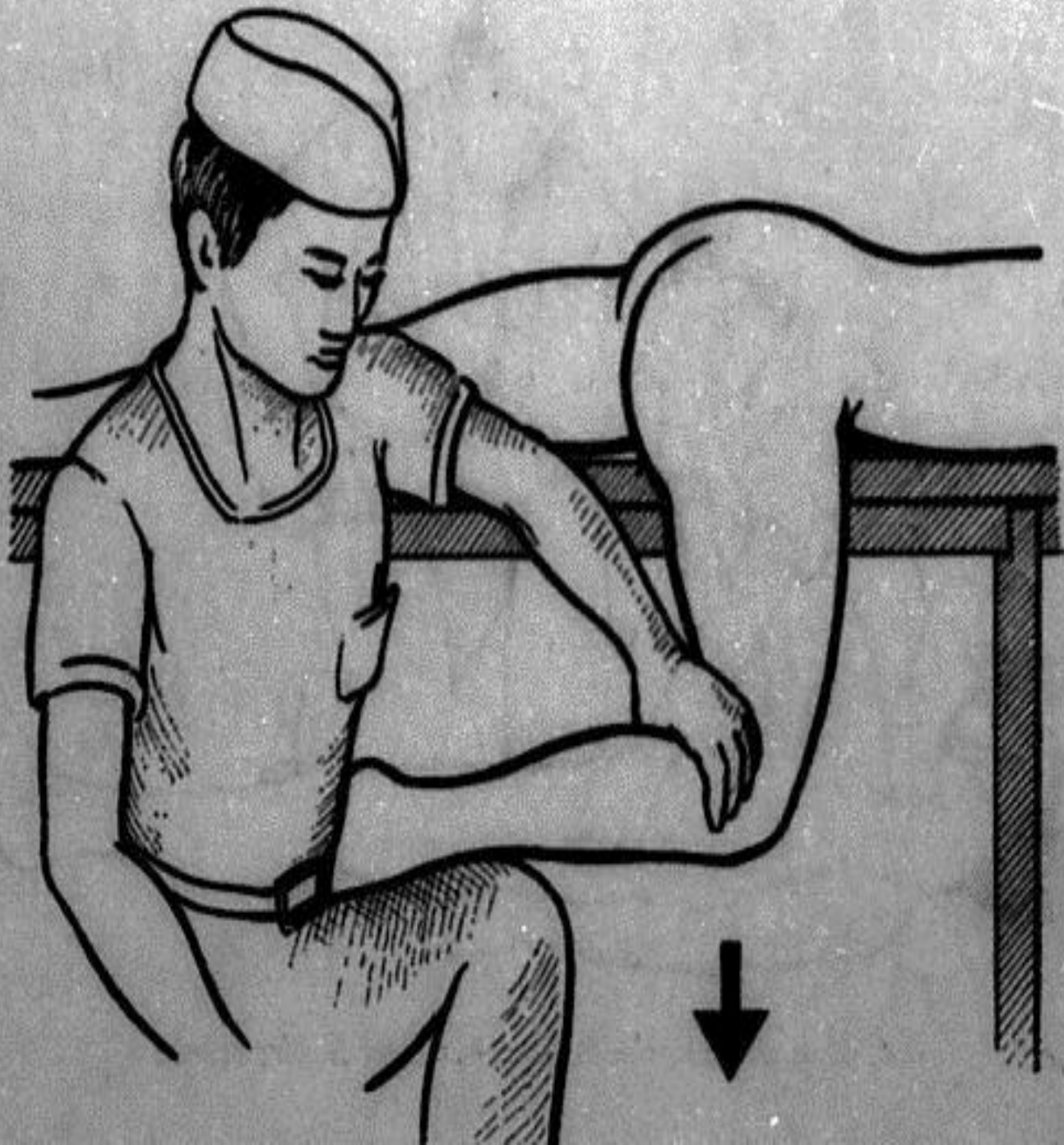




FIG. 307. — *Réduction de la luxation de la hanche.*

Premier temps : flexion de la cuisse sur le bassin.

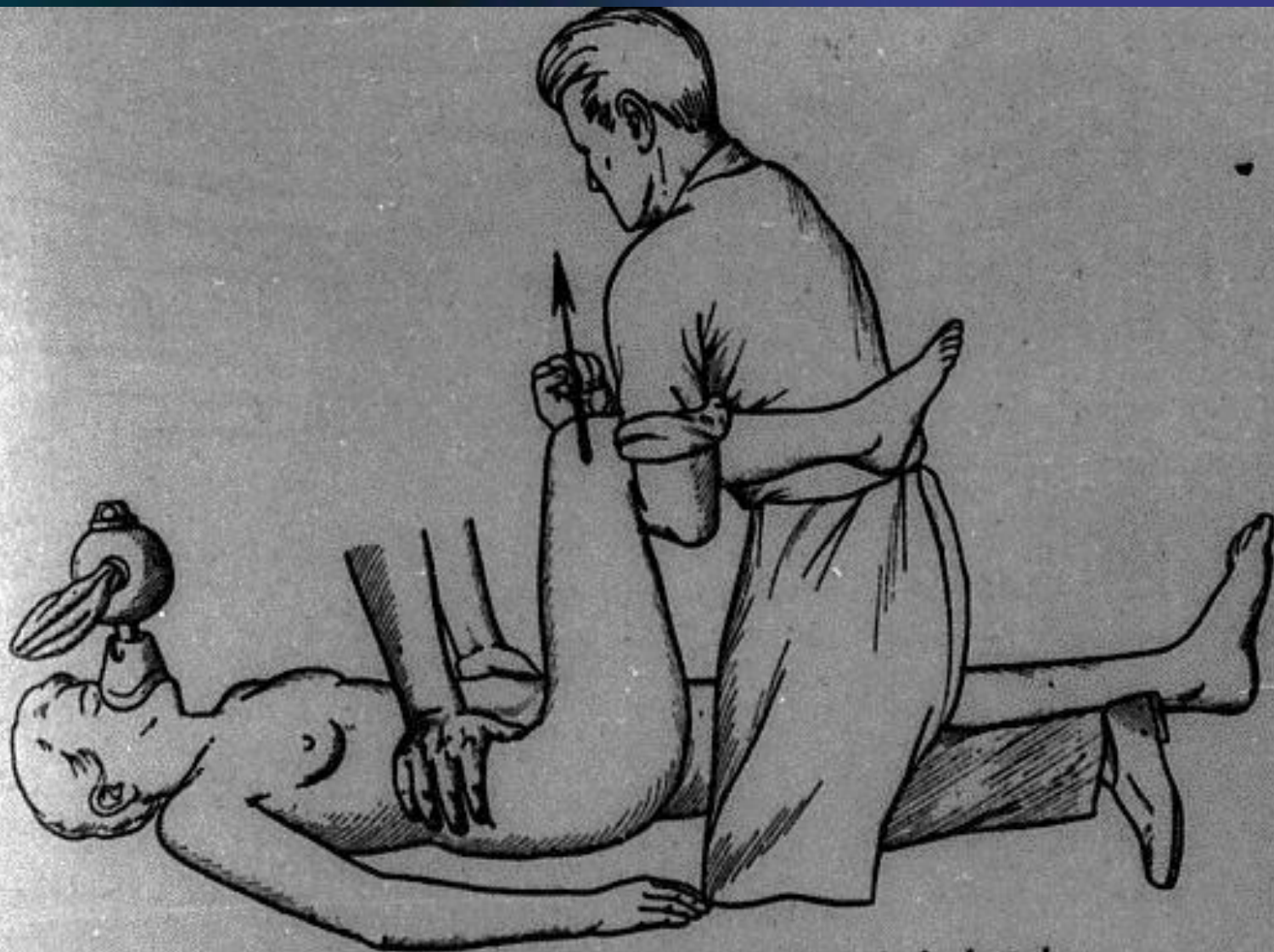


FIG. 308. — *Réduction de la luxation de la hanche.*
Deuxième temps : élévation forcée de la cuisse.

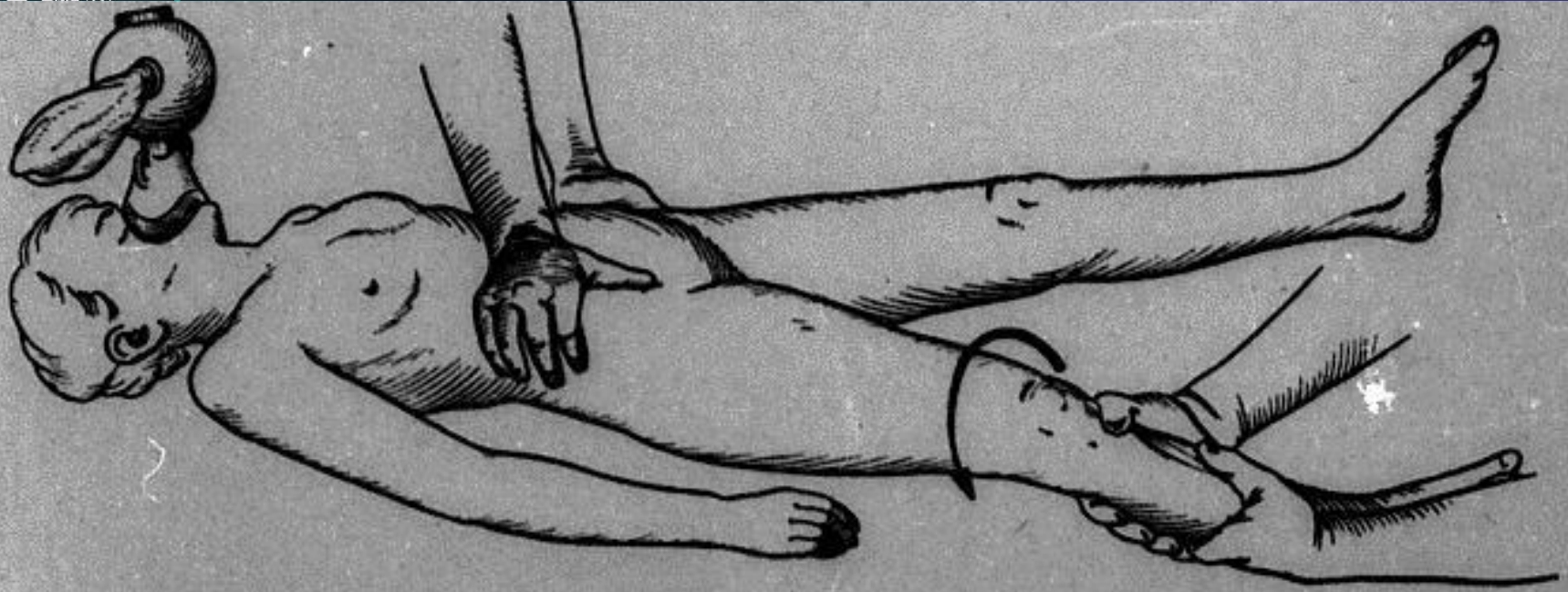


FIG. 309. — *Réduction de la luxation de la hanche.*

Troisième temps : extension, abduction et rotation externe.

(S'il s'agit d'une luxation ventrale, extension, adduction et rotation interne.)

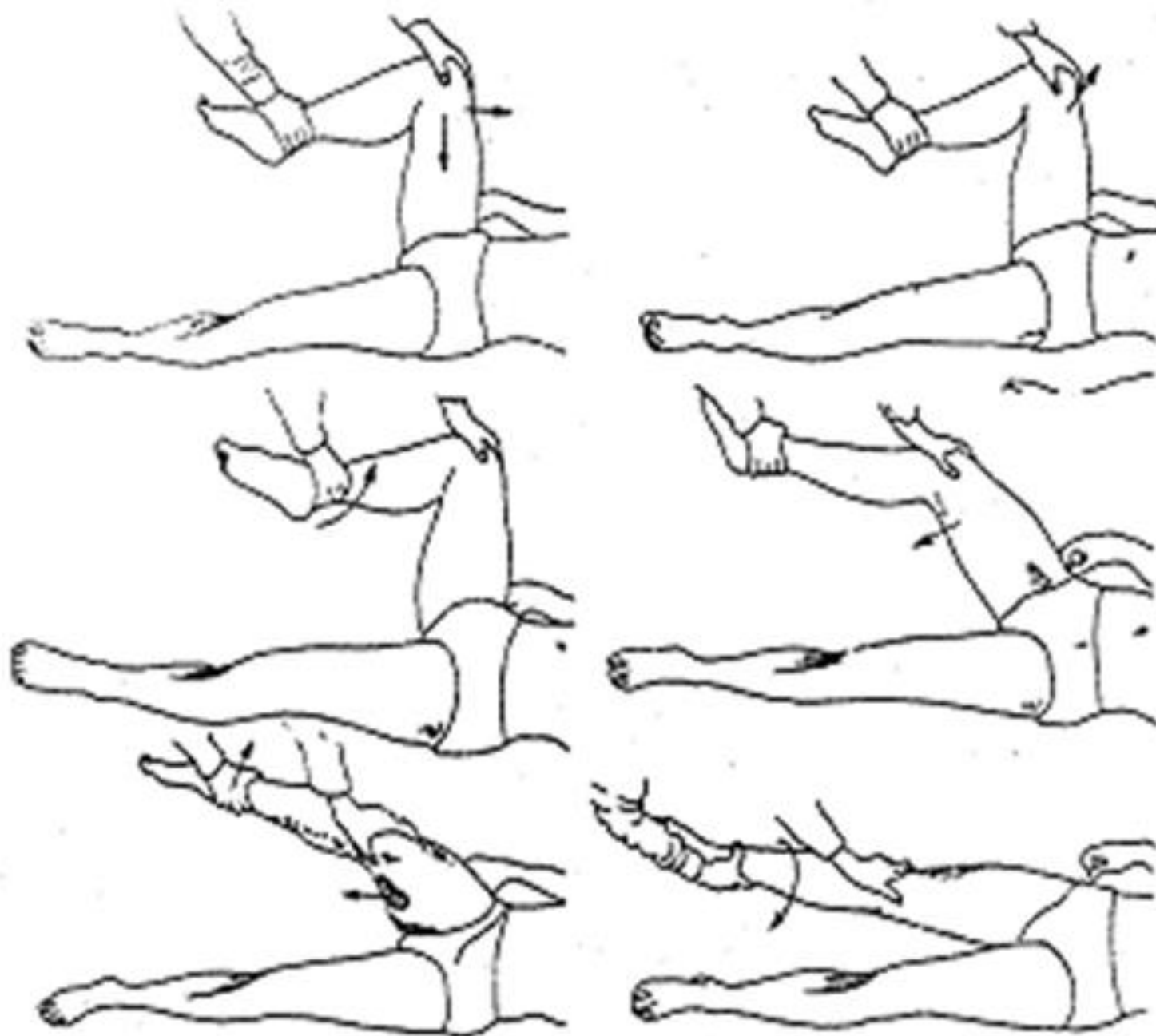


Fig.34. Metoda Bigelow de reducere a luxației de șold.



Coxofemural Luxations

EVOLUTION, PROGNOSIS

- If correctly treated, evolution is favorable:
 - Normal mobility
 - Absence of pain, limping
 - No X-ray alteration of mid-articular line or femur head
- Keep under surveillance to reveal late complications



Luxations of the Knee

- Less frequent
- In sports injuries (driving, horseback riding, mountain climbing, skiing, rugby)
- Varieties:
 - ✓ Anterior
 - ✓ Posterior
 - ✓ Lateral (internal or external)



Luxations of the Knee

Mechanism of occurrence

- **Anterior displacement** – hyperextension of the knee
 - If hyperextension $> 50^{\circ}$ - injury to popliteal vessels
- **Posterior displacement** – direct shock, forward to back, with the knee flexed
- Less often through forced varus-valgus movements

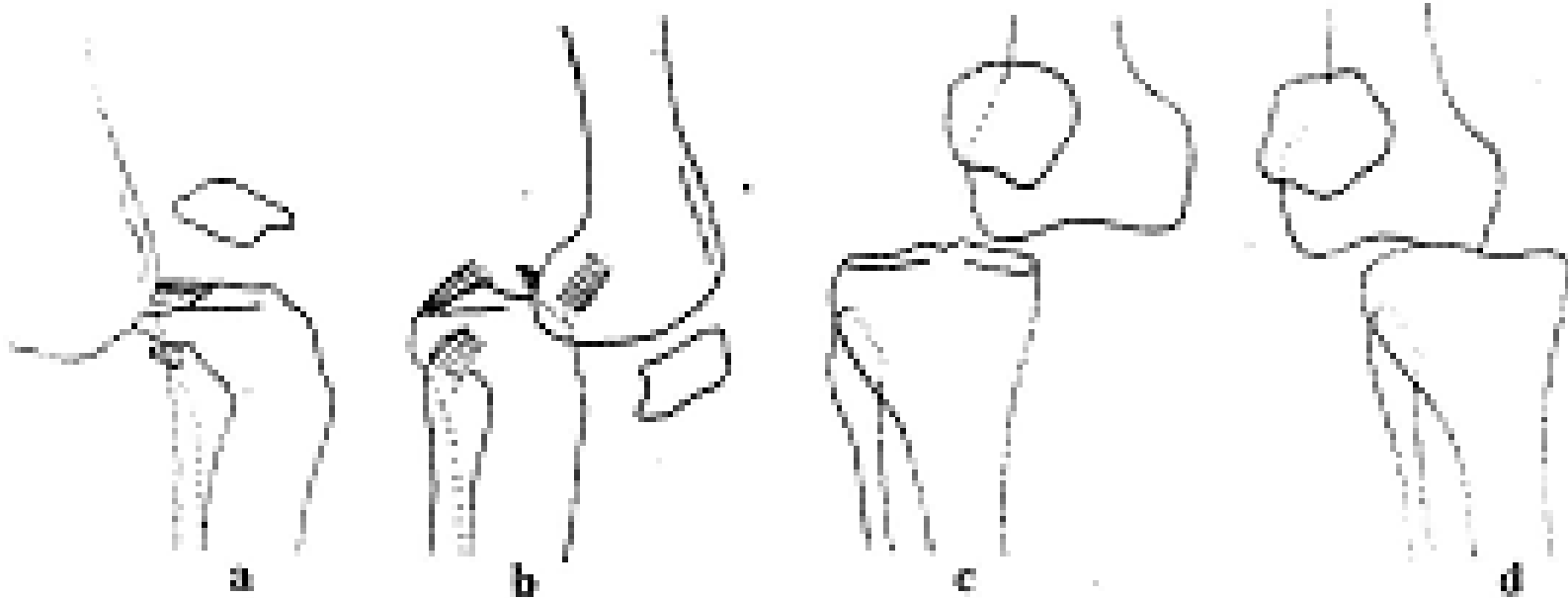


Fig.35. Varietăți ale luxației de genunchi: a.luxație anterioară; b.luxație posterioară; c.luxație medială; d.luxație laterală.



Luxations of the Knee

DIAGNOSIS

- Pain worsened by attempts to move the calf
- Edema, ecchymoses, hematoma
- Important haemarthrosis
- Anterior luxation – knee flexed, antero-posterior diameter increased
- Palpation – tibial axis doesn't go in the articulation
- Some situations – dangling joint
- Needs X-ray exam and arteriography



Luxations of the Knee

COMPLICATIONS

- Short-term:
 - Open dislocation – septic arthritis
 - Vascular complications
 - ✓ Acute peripheral ischemia syndrome
 - ✓ Lesions to popliteal vein
 - Nervous complications (external sciatic popliteal)
 - Osseous complications – tibial spine fractures, tibial plateau, femoral condyles
 - Cutaneous complications



Luxations of the Knee

COMPLICATIONS

- Long-term:
 - Chronic synovitis
 - Posttraumatic arthrosis
 - Joint rigidity
 - Articular instability



Luxations of the Knee

TRETMENT

- urgent – orthopedic reduction
 - immobilization via cast
- Addressing complications
- Radiological exams after reduction, since ruptures of central pivot, capsulo-ligamentar lesions may occur and necessitate surgical treatment

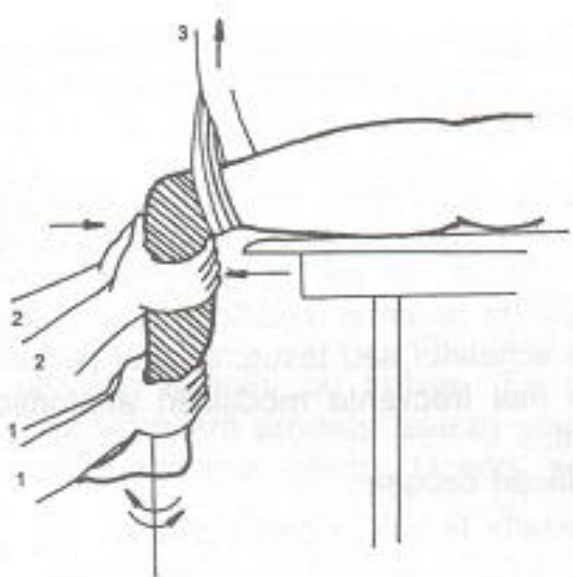


Fig. VI.25.9 – Manevrelle de reducere a luxației de genunchi.
 - bolnav în decubit dorsal; - un ajutor face flexia gambei (1);
 - medicul ia contact cu gamba la nivelul platourilor tibiale cu
 ajutorul ambelor mâini (2); - un alt ajutor poate să acționeze prin
 tracțiune pe coapsă prin intermediul unei chingi (3).

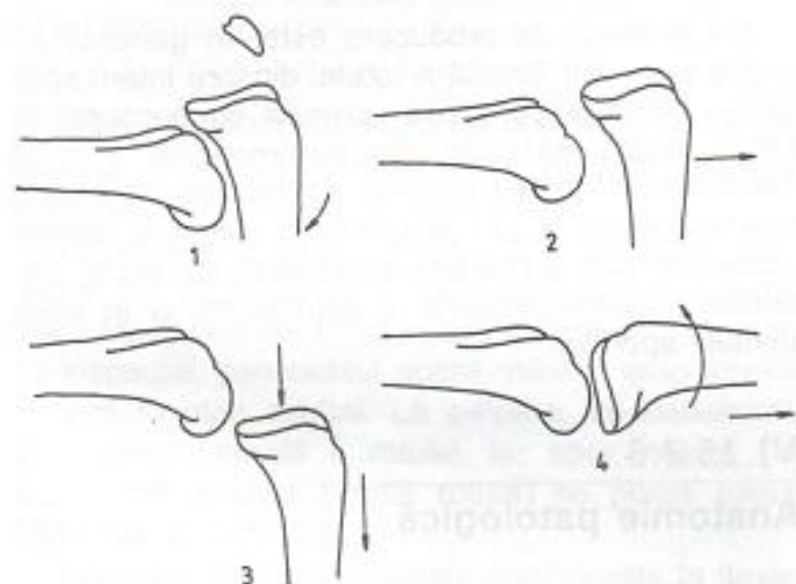


Fig. VI.25.10 – Timpul de reducere a unei luxații anterioare de
 genunchi: - flexia gambei în unghi drept pe coapsă (1);
 - tracțiunea gambei în axul coapsei (2); - tracțiunea gambei în
 jos cu coborârea platourilor tibiale (3); - axarea gambei pe
 coapsă prin extensie (4).

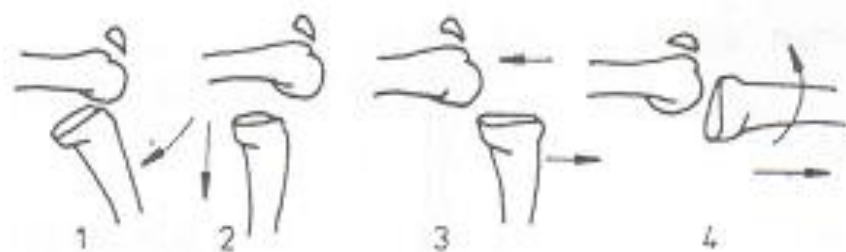


Fig. VI.25.11 – Timpul de reducere a unei luxații posterioare de
 genunchi: 1. flexia gambei; 2. coborârea platourilor tibiale;
 3. împingerea platourilor în sens distal; 4. axarea gambei pe
 coapsă sub extensie.

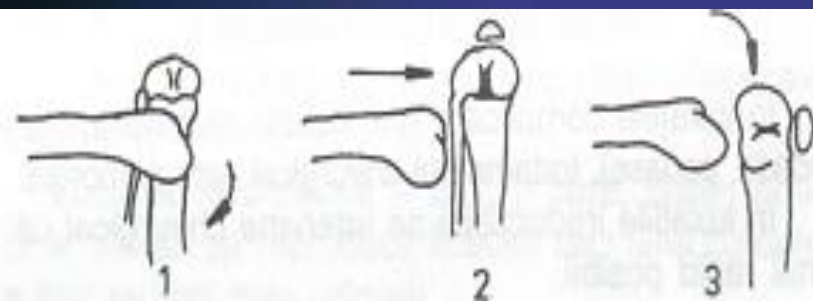


Fig. VI.25.12 – Timpul de reducere a luxației laterale. 1. gamba
 se flectează pe coapsă; 2. bascularea platourilor tibiale la nivelul
 condiliilor femurale; 3. rotația platourilor.