

# Differential diagnosis of shoulder pain/PGS (VPL)

In addition to shoulder joint disorders, shoulder pain and limited mobility can also be caused by diseases of the spine, muscles and possibly neurological causes. It is very important to localize the pain and its aggravation during specific movements and specify its radiation.

See anatomy of the shoulder and muscles of the shoulder.

## Diagnosis of shoulder pain

### Anamnesis

- Point with one finger - locate the pain,
- since when did it start paining, is it still lasting, does it depend on movement and load, any difficulties with normal activities (combing, dressing, brushing teeth),
- positions or movements for relief,
- injuries in the past,
- sleep disturbance due to pain,
- previous examinations and conclusions of other doctors.

### Examination of the joint

#### By looking

At rest and when moving, we observe:

- simultaneous movement of the scapula during abduction and anteversion,
- a change in the outline of the shoulder joint - the formation of a dimple during dislocation, the so-called **epaulette flag**,
- signs of inflammation (redness, swelling, increased temperature - omarthritis, acute calcifying subacromial syndrome),
- muscle atrophy in relation to the other shoulder - e.g. the supraspinatus muscle atrophies in the case of a long-lasting rupture of the capsule of the rotator cuff muscles.

#### By feeling

We feel the joint space

- through the tendon of the supraspinatus muscle (subacromial lateral)
- through the long tendons of the biceps (in the sulcus intertubercularis - e.g. in case of inflammation of the biceps tendon),
- or through the acromioclavicular joint.

### Joint function (movements)

Physiologically, in the shoulder a person can:

- anteversion/retroversion:  $170^{\circ}/0^{\circ}/40^{\circ}$ ,
- abduction/adduction:  $180^{\circ}/0^{\circ}/40^{\circ}$ ,
- external/internal rotation without abduction:  $40^{\circ}-60^{\circ}/0^{\circ}/95^{\circ}$ ,
- external/internal rotation in  $90^{\circ}$  abduction:  $70^{\circ}/0^{\circ}/70^{\circ}$ .

Symptoms of pain:

- painful arc in  $60^{\circ}-120^{\circ}$  in subacromial syndrome;
- pain at  $>160^{\circ}$  for shoulder joint disease.

Motion tests:

- the apron binding movement (ie, to the hips, to the lower L-spine, lower pole of the scapula) is a combination of internal rotation, adduction, and retroversion;
- the movement to reach the hands on the back by touching the hand over the head to the contralateral scapula is a combination of external rotation and abduction.

### Instability test

In the supine position, while fixing the scapula on the edge of the examination table, we will try to induce a pathological movement of the humeral head - dorsally, ventrally and axillary,

- Apprehension test - painful subluxation of the humeral head during maximum abduction and external rotation - positive during instability and subacromial pinching,

- Impingement tests (English: to impinge = to hit) – positive when the head of the humerus collides with the acromion and the rotator cuff is pinched ( impingement ),
  - Neer's test - forced external rotation (forced maximum anteversion) of the arm with increasing pain,
  - Hawkins test (the so-called police touch) – forced internal rotation of the arm in adduction,
- Cross body action – painful horizontal adduction during a pathological process in the acromioclavicular joint.

### Other diagnostic methods

- Laboratory examination - only if omarthritis is suspected - FW, KO, CRP,
- X-ray of the shoulder in 2 planes,
- USG,
- CT,
- arthrography – suspicion of damage to the rotator cuff capsule,
- scintigraphy - suspected tumor or arthritis.

## Differential diagnosis pain in the shoulder area

Pain in the shoulder with limitation of movement:

1. **shoulder scapular periarthritits**
  - radiating pain in the area of the deltoideus muscle, intensifying at night, pain when trying to stand up (the so-called painful arc ), at 60°–120° abduction, typically 35–55 years, more often in women;
  - differential diagnosis (dif.dg.): cervicobrachial syndrome (sy), cervicobrachial intervertebral disc prolapse, thoracic outlet sy (scalene sy), subclavian artery thrombosis, angina pectoris, Pancoast's tumor, carpal tunnel sy;
2. **arthrosis of the acromioclavicular joint (shoulder joint)**
  - during abduction above the horizontal, local pressure, above the acromioclavicular joint, from the age of 45, more often men;
  - dif.dg.: fracture of the clavicle, fragmentation of the shoulder joint;
3. **omarthrosis**
  - when pressed, limitation of movement of pain in all directions, deep pain in the shoulder, palpable crepitation, begins in the morning, no. from the age of 45, more often in men;
  - dif.dg.: fracture under the head of the humerus, pinching of the nerve (n. subscapularis , n. accesorius);
4. **omartritida**
  - redness, swelling and pain when moving the arms, can occur equally at any age;
  - dif.dg.: lymphangitis, acute calcifying subacromial sy;
5. **inflammation of the biceps tendon**
  - pressure and spontaneous pain in the sulcus intertubercularis, at any age, most often when overloaded with work, sports
  - dif.dg.: cervicobrachial sy;
6. **biceps tendon rupture**
  - is a sagging belly of the biceps.

Pain in the shoulder when movement is limited - with a feeling of instability, shoulder collapse , a feeling of a short popping of the joint:

1. **post-traumatic condition** – st.p. dislocations (mostly 20–35 years old);
2. **subluxation of the shoulder** in one or more directions (mostly 20–35 years) – diff.dg.: other instabilities;
3. **habitual dislocation** in one or more directions (without age prevalence) – diff.dg.: other instabilities, rotator cuff capsule rupture;
4. **dislocation** (violent) - without age prevalence, relatively rare. .

## Selected diseases of the shoulder joint

### Shoulder scapular periarthropathy

A group of diseases of various etiologies, especially **myotendinosis of the rotator cuff** , sometimes with a calcified core, or **lesions of the tendon of the supraspinatus muscle** and/or **the long tendon of the biceps brachii muscle** , when pinched in the narrowed subacromial space (**subacromial sy of the rotator cuff** ).

**Subacromial syndromes - rotator cuffs** In the clinical picture **of all forms of subacromial syndrome**, there is pain in the initial stage (with subacromial pressure laterally and ventrally), with a clear limitation of motion and with night pains.

- **Simple subacromial sy** – etiol.: tendomyopathy of the rotator cuff and/or long tendon of the biceps brachii muscle, possibly including subacromial bursitis..
- **Calcifying subacromial tendons** (tendinitis calcarea) – etiol.: tendomyopathy with calcium deposits, often in the tendon of the supraspinatus muscle.

In **simple and calcifying subacromial syndrome**, there is typically a **painful arc** – pain starting at 60° of adduction and ending at 120°.

- **Frozen shoulder syndrome ( stiff shoulder )** – etiol.: tendomyopathy with fibrosis and shrinkage of the capsule.

Limited special mobility - forward abduction, rotation, attempt to touch the back and back of the waist, "tying the apron" movement, limited external rotation more than abduction, abduction more than internal rotation

- **Destructive subacromial sy** - etiol.: complete or partial rupture of the rotator cuff and/or long tendons of the biceps brachii muscle.

Weak start of abduction ev. If the atrophy of the supraspinatus muscle lasts longer, if it is only partial, the strength is not reduced.

Diagnostics:

- test of function by limiting abduction;
- positive "impingement tests" according to Neer and Hawkins;
- "painful arc" typically in subacromial syndrome.
- USG marks:
  - bursitis subacromialis - doubling of the border of the layer to the deltoideus muscle;
  - calcified formations - US shadows and strong echo reflection;
  - tendon damage - reversal of the convexity of the tendon echo in both two planes.
- X-ray marks:
  - X-ray-contrast calcified formations;
  - subacromial osteophytes (calcific growths);
- **Cave:** always examine and record the mobility test of the cervical spine - due to the possible (frequent) co-occurrence of cervicobrachial and subacromial syndrome.

Therapy:

- **General** - physical care of the joint (do not strain, do not irritate), but do not immobilize it with a bandage so that **it does not stiffen**.
- **Local physical therapy** - cold massage with ice for acute symptoms, heat for chronic symptoms, electrotherapy with Träber currents, possibly even ultrasound, whenever iontophoresis is possible, analgesics can be applied locally externally, ointments with menthol or capsaicin can be applied for blood circulation or NSAAs. (usually we prescribe only 6 procedures and further depending on the effect, the patient's reaction is individual).
- **Manual therapy and LTV** (therapeutic physical exercise) - mobilization of downward and lateral traction (rocking with a full bucket), strengthening of rotators with elastic elements (even at home), then manual release of the C-spine and upper Th-spine and sacroiliac joint.
- **Pharmacotherapy** - acutely first symptomatically NSAID ev. corticoids shortly after (if they are not contraindicated), chronic stages by spraying with local anesthetics or in combination with corticoids, intra- and extracapsularly, calcareous deposits (deposits) can be tried to be aspirated by puncture or break with a shock wave (ESWT), in case of chronic resistance, we will perform a surgical decompressive intervention.

## **Tendinosis / rupture of the biceps brachii tendon**

The etiology is the same - usually based on impingement.

Pain when pressure is applied to the sulcus intertubercularis (in internal rotation 10° ventrally), during abduction, possibly. when bracing with an arch. At the same time, there is also pain during forced supination with a bent elbow against isometric resistance (the so-called Yergason test). Tendinosis can be complicated by a rupture - the belly of the biceps clearly moves down, especially visibly when bending the elbow against applied resistance.

Diagnostics:

- USG examination tends to be very profitable;
  - hypoechoic ring around the biceps tendon (so-called halo );
  - different thickness to the bilateral tendon;
  - upon rupture, the sulcus is empty - dif.dg. dislocation of the tendon in the direction of the tuberculum minus humeri;
- An X-ray is not conclusive, so an event will help in rare cases. performing an MRI.

Therapy:

- in tendinosis therapy as in subacromial syndrome;
- in case of rupture, rarely (especially in people under 50 years of age) and after injuries in athletes - refixation (so-called keyhole surgery), as a rule, there is no significant deterioration of function, but it is more of a cosmetic problem.

## **Osteoarthritis (=arthrosis of the shoulder joint)**

- primary arthrosis - more rarely, there is no static load in the shoulder as in DK joints;
- secondary arthrosis - after old injuries, necrosis of the humeral head, osteochondrosis dissecans, etc. after changes in rheumatic diseases, more often in people over 45 years old.

In the beginning, the difficulty is only discrete, pain is felt later during movement, which is actively and passively limited, we hear friction sounds and feel crepitation, muscle atrophy of the rotator cuff and deltoid muscle may also occur.

#### Diagnosics:

- functional tests – limitation of movement in all directions, especially rotation and abduction, pain when kneading – movement is limited typically: in abduction and external rotation of the shoulder;
- X-ray signs – narrowing of the joint space, sclerotization of the joint surfaces, the presence of marginal osteophytes, the shape of the head of the humerus is changed – dif.dg. arthrosis of the acromioclavicular joint, omarthritis.

#### Therapy:

- physical – interference currents, short-wave diathermy (heating), LTV;
- pharmacotherapy – NSAIDs;
- infiltration therapy - with local anesthetics or together with a corticoid;
- nursing assistance to prevent irritation of the shoulder joint - when putting on socks and shoes;
- treatment mainly consists of warm compresses (possibly electrodes, thermos bottles), climbing the wall with your fingers. Despite shoulder pain, gentle rehabilitation maintains momentum in the joint so that the shoulder does not stiffen! ( **Cave** : the arm stiffens quickly when immobilized);
- surgery - rarely, in case of significant patient suffering, arthrodesis, isoelastic hemiprosthesis, endoprosthesis of the shoulder joint (head or whole - head and glenoid), cervicocapital ev. total endoprosthesis.

### Omartritida

It is a rheumatic or bacterial inflammation no. during hematogenous dissemination or iatrogenically after puncture.

There is pain when moving in all directions, signs of inflammation such as swelling, redness, increased temperature of the surface of the shoulder, the border of the joint merges with the surroundings. Relief holding the arm typically in internal rotation. It can be complicated by sepsis , septic shock, destruction and possibly and ankylosis of the joint.

#### Diagnosics:

- laboratory - inflammatory markers (FW, CRP), tuberculin test, search for infection in the ENT area and teeth, tests for rheumatological causes;
- USG – joint sprain;
- X-ray signs of incipient joint destruction, possibly CT , MRI , if a normal X-ray is not enough.

#### Therapy:

If septic arthritis is suspected - immediately send to surgery if necessary. orthopedics (systematic ATB treatment, flushing drainage of the joint, arthroscopic or open synovectomy).

Otherwise, according to the rheumatic disease.

### Arthrosis of the acromioclavicular (acromial) joint

It is idiopathic or the result of an unrecorded injury with dislocation of the acromial joint (Tossy type I), possibly also as a result of long-lasting strenuous work, possibly sports like javelin. Underrated.

Clinically, pain when moving above the horizontal (during long heavier work overhead in horizontal adduction), night pain, improvement when lying on the side. Acromial joint compression. The pain is often stronger than in osteoarthritis.

#### Diagnosics:

- positive horizontal adduction test – we adduct the arm in 90° anteversion with the elbow bent to the opposite shoulder, the highest pain is between 160°-180°;
- trial infiltration of the joint with a local anesthetic;
- X-ray panoramic image of the shoulder joint in the AP-projection (where there is a finding of a club-shaped protrusion on the lateral end of the clavicle, hypersclerosis of the joint surfaces).

Dif.dg.: osteosarcoma of the lateral end of the clavicle (rare, rather painless swelling), omarthrosis, arthritis of the acromial joint.

#### Therapy:

- after specifying dg.: start therapy with ultrasound, application of heat, LTV, NSA, spray the joint within 2-4 weeks, possibly with corticoid, ev. we indicate for surgery (resection, interposition plastic);
- after treatment - without immobilization - LTV approx. 3 times a week to mobilize the shoulder, the patient himself performs the mobilization daily.

Incapacity for work for 3-4 weeks, then work and sports.

Prognosis – after the procedure, the patient is practically without any problems.

### Shoulder dislocation

Dif.dg.:

- congenital;
- habitual (one-/multidirectional) – during banal movement, minimal violence, possibly carried out arbitrarily by the patient - in the case of weakness of the ligaments, only rarely pathology, therapy obv. conservative,
- spontaneous (dorsal/multidirectional) – in congenital dispositions or **trained** , no accompanying pathology, only conservative therapy,
- traumatic/recurrent traumatic,
  - as a result of falling on the hand/elbow in shoulder abduction ev. with interrupted extension (swinging) of the arm,
  - findings: Bankart lesion , Hill-Sachs defect , tuberculum majus break, labrum glenoidale break ,
  - therapy: operative for the second recurrence of the injury.

Most often, in about 90%, the head of the humerus luxates forwards downwards, more rarely in 7-8% backwards downwards, rarely even into the armpit.

A complete dislocation of the shoulder is manifested by a sparing position of the arm and the inability to move it, a typical epaulet symptom (a hole at the level of the joint's original position), significant pain in the case of a traumatic dislocation, minor pain in the case of habitual and arbitrary dislocation, paresthesia to hypoesthesia of the arm (so-called **dead arm sy** ) .

Subluxation is manifested by a feeling of instability - short-term slippage of the head with spontaneous reposition. Depending on the direction of the subluxation, we distinguish anterior, posterior or caudal instability. Acquired (sports overload) or congenital. We most often see bilateral habitual dorsal subluxations.

It can be complicated by tearing of the brachial plexus or other nerve damage, and accompanying bone injuries.

Diagnostics:

- Subluxation or recurrent dislocation - from the medical history + we will perform **an apprehension test** (abduction and external rotation after maximum extension of the arm) + a positive **drawer insertion test** in chronic instability + USG anterior/posterior subluxation during dynamic examination (Hill-Sachs defect in the horizontal dorsal image characteristic of recurrent post-traumatic dislocation) + X-ray (associated traumatic signs on the bones), rarely double-contrast CT.
- Complete dislocation - visible deformation of the shoulder, painful limitation, possibly full inability to move HK, ev. pit symptom, we will check the blood supply, motility and sensitivity, hospitalize for surgery or. orthopedics.
- Habitual/involuntary dislocation – inadequate injury in the anamnestic, usually able to repair itself, sometimes it is necessary to perform a strengthening operation according to Bankart.

Therapy:

- for PL: in case of complete luxation before repositioning, X-ray (if possible) then reposition as quickly as possible (thus preventing damage to blood vessels and nerves) - attempted reposition according to Arlt, Hippocrates, Kochler - **in the Czech Republic, due to complications, it is not recommended to be performed for PL** - it is not- if possible, immediate hospitalization (do not specify dg.), in case of severe pain, analgesics, possibly iv, in case of subluxation, send to a specialist for further examination and introduction of therapy,
- retreatment in PL: traumatic dislocation – reduction for 3 weeks with a Gilchrist splint, then intensive RHB; habitual luxation/subluxation – immediately RHB (do not immobilize),
- indications for surgery - in the case of a second traumatic recurrence of dislocation - with each subsequent dislocation, damage to the capsule and cartilage would worsen - surgery is decided according to arthroscopy (open/arthroscopic Bankart suture - gathering of the capsule complex and its fixation to the anterior/posterior edge of the glenoid),
- after discharge from the hospital - after stabilization surgery 4-6 weeks in Gilchrist bandage, but at the same time necessarily passive exercise of movements up to 45° anteversion and abduction (Cave: danger of freezing of the shoulder), after relative rest start muscle strengthening to actively stabilize the rotator muscles. Finally, they also practice active external rotation with abduction. Sports with movements below the horizontal at the earliest in six months, intensive sports at the earliest after a year.

The prognosis of post-traumatic recurrent dislocation after conservative therapy is 80%, after operative therapy only 5-12%. Habitual luxation is more difficult to stabilize surgically in the long term - muscle strengthening is the best physiotherapy on an outpatient basis. Sometimes the operation causes a restriction of external rotation, possibly omarthrosis occurs.

## Affection of the sternoclavicular joint

Irritation from other diseases in the shoulder area.

1. Luxation and subluxation of the sternoclavicular joint
  - often by an indirect injury from the side - with a lever movement of the clavicle through the 1st rib ventrally or cranially, in younger people possible spontaneous dislocation.
2. Arthritis of the sternoclavicular joint
  - rarely, mostly in middle-aged women. It is manifested by swelling of the joint or with soreness on pressure, increasing on retroversion and abduction of the arm;
  - diagnosis: X-ray finding of cystic sclerotic growths on the medial end of the clavicle, CT clarification of the changes, scintigraphy with the finding of increased local activity, especially in the area of soft tissues;
  - diff.dg.: bacterial/rheumatic arthritis (lab.high), tumors (e.g. osteosarcoma), post-traumatic instability,

Tietz syndrome (osteonecrosis of the medial end of the clavicle or sternal junction);

- therapy: do not tighten movements to extreme positions, physiotherapy with ultrasound, Träber currents, iontophoresis, enelbin wraps, intra-articular injection with local anesthetic (probatory and therapeutic) and possibly with the addition of a diluted corticoid, surgery (resection of the medial end of the clavicle) possibly. in the case of persistent difficulties, only a specialist is indicated.

## Vertebrogenic and neurogenic shoulder pain

Pain in other diseases can be reflected in the shoulder area - dif.dg.:

- From the C-spine area:
  - disc disease,
  - osteochondroma,
  - spondylarthrosis of the joint.
- Defective posture and muscle imbalance in the area of the C-spine and Th-spine,
- Reversible blocks in the area of the C-spine and Th-spine,
- Suprascapularis entrapment syndrome,
- Narrowed passages of all peripheral nerves,
- Neurogenic deformation with secondary arthrosis and joint malposition,
- Projection of pain in liver and gall bladder disease - to the right shoulder,
- Metastases to the lymph nodes (Virchow's node) in stomach cancer (left),
- Angina pectoris.

## Links

### Related Articles

- Shoulder joint

### References

- GESENHUES, S – ZIESCHÉ, R. *Vademecum lékaře : Všeobecné praktické lékařství*. 1. české edition. 2006. ISBN 80-7262-444-X.