

LEG PAIN

This section deals with causes of pain arising from local lesions within the leg, or referred into the leg. Pain in the leg is a common complaint and the majority of cases are of vascular or orthopaedic origin. Joint problems are dealt with in the section on Joint disorders (p. 267).

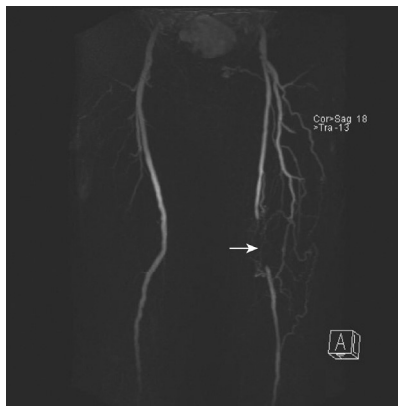


Figure 41 MRA femoral vessels. A block in the left (superficial) femoral artery in the adductor canal (arrow) can be seen. The distal artery fills via numerous collaterals. The patient presented with intermittent claudication in the left calf.

CAUSES

TRAUMATIC

- Fractures
- Dislocations
- Crush injuries

INFLAMMATORY

- Rheumatoid arthritis
- Reiter's disease
- Ankylosing spondylitis

INFECTIVE

- Cellulitis
- Septic arthritis

- Myositis
- Osteomyelitis

DEGENERATIVE

- Osteoarthritis
- Meniscal lesions
- Baker's cyst

VASCULAR

- Intermittent claudication
- Deep venous thrombosis
- Acute arterial occlusion

NEUROLOGICAL

- Sciatica
- Peripheral neuropathy
- Neurogenic claudication

METABOLIC

- Gout

NEOPLASTIC

- Osteogenic sarcoma
- Secondary deposits

OTHER

- Cramp
- Polymyalgia rheumatica
- Strenuous exercise

HISTORY**Traumatic**

Obvious history of trauma.

Inflammatory

History of joint swelling, stiffness, limitation of movement. Pain on walking. There may be an obvious history of rheumatoid arthritis with signs elsewhere, e.g. the hands. Reiter's disease – conjunctivitis, urethritis. Ankylosing spondylitis – stiffness of the spine, especially in the morning; hip and knee involvement.

Infective

Cellulitis may arise from puncture wounds, e.g. insect bites or in a lymphoedematous leg. The patient presents with pain, redness, tenderness, malaise and fever. Myositis may occur in association with collagen diseases, e.g. scleroderma, dermatomyositis. Osteomyelitis is rare but more common in childhood. History of immunosuppression or diabetes. Recent history of infection elsewhere. Pain aggravated by movement. Swelling and redness of the affected area. Septic arthritis presents with a red, hot, tender, painful joint. More common in children. In adults, enquire about a history of steroid therapy or diabetes.

Degenerative

Osteoarthritis presents with pain, stiffness and deformity. The pain is often worse on starting walking and then improves. Baker's cyst presents with a lump behind the knee. The patient may complain of pain and swelling of the calf if the cyst ruptures. With meniscal lesions, there is usually a history of twisting the knee, e.g. playing football. The knee may lock.

Vascular

Deep venous thrombosis presents with painful swelling of the leg. There may be a history of the contraceptive pill, prolonged immobilisation, recent surgery, malignancy. Acute arterial occlusion results in sudden onset of severe pain in the affected limb. The patient is unable to move the leg and complains that the leg feels cold. With intermittent claudication, there is pain on walking, relieved by rest. It may affect the calf, thigh or buttock. Rest pain in the foot may occur with advanced arterial disease. The pain is often worse in bed at night and the patient obtains relief by hanging the foot out of bed.

Neurological

Pain down the back of the leg (sciatica) often made worse by coughing, movement or straining. The patient may also complain of backache with painful spasm in the back muscles. There are restricted movements of the spine. Neurogenic claudication results from central spinal canal stenosis. Symptoms improve with flexion, as this increases the diameter of the canal. Therefore, patients find it easier to cycle than walk and easier to walk upstairs than downstairs. With neurogenic claudication, the claudication distance becomes progressively shorter with each bout of pain during one walk but not with vascular claudication. It also takes the pain of neurogenic claudication longer to settle than the pain of vascular claudication. The two forms of claudication may co-exist, making diagnosis difficult.

Metabolic

Gout presents as acute severe pain with redness and swelling of a joint. There may be a history of previous episodes. History of trauma,

surgery, infection, diuretics, polycythaemia, leukaemia, cytotoxic therapy or immunosuppressive therapy.

Neoplastic

Osteogenic sarcoma usually presents in men between 20 and 40 years old. There is usually swelling around the knee, the commonest sites of the tumour being the lower femur or upper tibia. The patient often complains of bone pain, swelling or cough due to lung secondaries. Pain or pathological fractures may be due to secondary deposits. These may occur from the breast, lung, thyroid, prostate or kidney. Check for symptoms related to these or previous surgery for malignancy.

Other

Polymyalgia rheumatica usually occurs in elderly women. There is aching, morning stiffness in proximal muscles and often associated arthritis. Cramp is painful muscle spasm. The patient often complains of severe pain in the legs, especially at night or after exercise. It may occur with salt depletion, myopathy or muscle ischaemia. It is common in chronic renal failure.

EXAMINATION

Traumatic

Pain, loss of function, tenderness, deformity, crepitus, abnormal mobility. Check for associated nerve and vascular injuries.

Inflammatory

Pain in joints, swelling, tenderness, loss of movement, fixed deformities, disturbances of gait. Signs of rheumatoid arthritis elsewhere. Reiter's disease – conjunctivitis, urethritis. Ankylosing spondylitis – stiffness of the spine, reduced thoracic excursion, fixed kyphotic spine, hyperextended neck.

Infective

In acute cellulitis, there is redness and tenderness over the affected area. Inguinal lymphadenopathy may be present. With acute osteomyelitis, there is tenderness and heat over the site of infection. With myositis, there is tenderness and wasting of the muscles. There may be other signs of collagen diseases, e.g. polyarteritis nodosa, SLE, scleroderma or dermatomyositis. In septic arthritis, there is a hot, tender, painful, swollen joint and all movements are painful. Surrounding muscle spasm is present.

Degenerative

In osteoarthritis, there is deformity, synovial thickening, bony enlargement due to osteophytes, effusion, loss of movement and fixed deformities. Baker's cyst presents as a swelling in the popliteal

fossa. If it has ruptured there is pain and swelling of the calf. Meniscal lesions present with swelling of the knee and tenderness over the joint line in the early phase. Later, there may be a continued effusion with wasted quadriceps and a positive McMurray sign.

Vascular

Deep vein thrombosis presents with pain, tenderness, swelling and heat, usually over the calf. There is ankle oedema. With iliofemoral thrombosis, there may be phlegmasia alba dolens (white leg) or phlegmasia cerulea dolens (painful blue leg). Acute ischaemia presents with the five Ps: pain, pallor, pulselessness, paraesthesia and paralysis. Check for atrial fibrillation. With intermittent claudication, examine for absent pulses. Buerger's test.

Neoplastic

There is usually a hot, tender swelling around the knee joint in either the lower femur or upper tibia. Examine the chest for lung metastases. With secondary deposits, check the lung, breast, thyroid, prostate and kidney.

Neurological

Lordosis, limited straight leg raising, restricted back movements. Reduced reflexes in the lower limb. Areas of absent sensation.

Metabolic

With gout, there will be a tender, red, swollen joints with limitation of movement. Check for gouty tophi elsewhere.

Other

Polymyalgia rheumatica presents with tenderness over muscles and arthritis. Occasionally there is associated giant cell arteritis.

Examine the temporal artery for tenderness. With cramp, there may be signs of chronic renal failure.

GENERAL INVESTIGATIONS

■ FBC, ESR

Hb ↓ anaemia of chronic disease, e.g. rheumatoid arthritis, collagen disease. WCC ↑ infection, e.g. osteomyelitis, septic arthritis. ESR ↑ inflammation, e.g. rheumatoid arthritis, malignancy, polymyalgia rheumatica.

■ CRP

↑ infection/inflammatory disease.

■ U&Es

Chronic renal failure. Renal involvement in collagen disease.

■ LFTs

Alkaline phosphatase ↑ in liver secondaries.

- **Rheumatoid factor**
Rheumatoid arthritis.
- **Blood glucose**
Diabetes – neuropathy, peripheral vascular disease.
- **Serum uric acid**
Gout.
- **Local X-rays**
Fractures, Osteoarthritis, Rheumatoid arthritis, Chronic osteomyelitis, Tumours.
- **Lumbosacral spine X-ray**
Disc lesions. Osteophytes. Narrowing of joint spaces. Lordosis.
- **CXR**
Secondary deposits in osteogenic sarcoma.

SPECIFIC INVESTIGATIONS

- **CT**
Local lesion. Spine, e.g. disc lesion, tumour, neurogenic claudication – narrowing of canal.
- **MRI**
Spine, disc lesion, tumour.
- **Duplex Doppler**
DVT. Arterial disease.
- **Arteriography**
Vascular disease (Fig. 41).
- **Venography**
DVT.
- **Nerve conduction studies**
Nerve lesions, peripheral neuropathy.



- Always carefully examine the pulses. Vascular disease in the lower limbs is a common condition.
- Acute ischaemia presents with the five Ps (see above). Treatment is urgent.
- Vague swelling and thickening around the knee joint in 20–40 year olds may be due to osteogenic sarcoma. Refer for X-ray.

LEG SWELLINGS

Swelling of the lower limb may be unilateral or bilateral. Bilateral swellings are usually due to medical conditions such as cardiac, renal or hepatic failure. Unilateral swellings are commonly due to trauma, venous disease or lymphatic disease.



Figure 42 Phlegmasia cerulea dolens. The painful, swollen, blue leg results from a massive ilio-femoral venous thrombosis. It may lead to venous gangrene unless the resulting high tissue pressure is relieved by thrombectomy. In this patient, blood-filled blisters and gangrene of the toes have already developed. This is a relatively rare presentation of deep vein thrombosis.

CAUSES

LOCAL

ACUTE SWELLING

- Trauma
- DVT (Fig. 42)

- Cellulitis
- Rheumatoid arthritis
- Allergy

CHRONIC SWELLING

- Venous
 - Varicose veins
 - Obstruction to venous return, e.g. pregnancy, pelvic tumours, IVC obstruction, post-phlebotic limb
- Dependency
- Lymphoedema
- Congenital malformations, e.g. arteriovenous fistulae
- Paralysis (failure of muscle pump)

GENERAL

- Congestive cardiac failure
- Hypoproteinaemia, e.g. liver failure, nephrotic syndrome, malnutrition
- Renal failure
- Fluid overload
- Myxoedema

HISTORY

Bilateral leg swelling is usually due to systemic conditions, e.g. cardiac failure, while unilateral leg swelling is more often due to local causes, e.g. DVT, cellulitis. Pain will be associated with trauma, DVT, infection or complications of varicose veins. Other causes of swelling of the lower limb may be painless, although the limb may be uncomfortable if the oedema becomes tense. Evidence of the following should be sought in the past medical history: trauma to the limb, recent pregnancy (DVT), abdominal or pelvic malignancy, previous surgery or radiotherapy to lymph nodes, thyroid disease, congestive cardiac failure, renal failure, liver failure, malnutrition, poliomyelitis in childhood, nerve lesions. With primary lymphoedema, the leg may have been swollen since birth or oedema may have developed at puberty (lymphoedema praecox) or in the third decade (lymphoedema tarda).

EXAMINATION

The presence of fracture, contusion or haematoma should be obvious. With cellulitis, the limb will be red, swollen, hot and tender. A puncture wound may be visible. DVT may be suspected if the limb is tender and swollen, particularly the calf, with a positive Homans' sign, i.e. pain in the calf on dorsiflexion of the foot. Tenderness may be present over the femoral vein with femoral vein thrombosis.

The limb may be pale and swollen to the groin (phlegmasia alba dolens) or tense and purplish and extremely painful (phlegmasia cerulea dolens) with iliofemoral thrombosis. Bilateral swelling with dilated collateral veins on the abdominal wall suggests IVC thrombosis. Swelling and tenderness over the joints may suggest rheumatoid arthritis. Lymphoedema pits in the early stages but in the later stage, it becomes non-pitting, when the skin and subcutaneous tissue become thick and eventually hyperkeratotic and warty. Previous scars in the groin, a mass of malignant nodes or signs of previous radiotherapy will suggest lymphoedema as a possible cause.

In the presence of an arteriovenous fistula, there will be dilated veins which do not collapse on elevation of the limb. The limb will be warmer than the opposite limb; palpation will reveal a thrill and auscultation will reveal a continuous machinery bruit.

Localised swelling of the limb may be due to a tumour. There may also be associated distal swelling due to venous or lymphatic obstruction.

Swelling due to neurological damage, e.g. nerve lesions or poliomyelitis, will result in wasting, which should be apparent. Examination of the abdomen may reveal hepatomegaly or an abdominal mass, which could obstruct the venous outflow. It is appropriate to carry out a rectal examination for a pelvic tumour, which may be causing back pressure on the venous and lymphatic system or may have resulted in a 'frozen' pelvis.

GENERAL INVESTIGATIONS

■ FBC, ESR

A large haematoma associated with trauma or fracture may result in a low Hb. WCC ↑ will suggest infection. Haematoma may be associated with a reduced platelet count.

■ Urinalysis

Proteinuria may suggest a renal cause.

■ U&Es and creatinine

Raised urea and creatinine will be associated with renal failure.

■ LFTs

May indicate impaired liver function with associated hypoalbuminaemia.

■ Blood glucose

Cellulitis or other infections of the leg may be associated with diabetes.

■ CXR

Findings suggestive of cardiac failure are cardiomegaly, pulmonary oedema and pleural effusions. Pulmonary oedema may be associated with fluid overload associated with renal failure. Secondary deposits may be seen in association with sarcoma of the limb.

■ **Limb X-ray**

May show fracture, tumour or gas in the tissues associated with gas gangrene.

SPECIFIC INVESTIGATIONS

■ **Clotting screen**

There may be abnormal clotting associated with coagulopathy, resulting in spontaneous haematoma.

■ **TFTs**

Myxoedema

■ **US**

Haematoma or soft-tissue sarcoma.

■ **CT**

Haematoma or tumour.

■ **MRI**

Soft-tissue sarcoma.

■ **US or CT pelvis**

May show an abdominal or pelvic mass causing extrinsic pressure on the veins.

■ **Duplex Doppler**

Will show DVT or arteriovenous fistula.

■ **Venography**

Will confirm DVT.

■ **Arteriography**

Will confirm the presence of an arteriovenous fistula.

■ **Lymphangiography**

May demonstrate the cause of lymphoedema, e.g. hypoplasia or obstruction.

■ **Lymph node biopsy**

Infection or tumour.



- Patients with unexplained DVT may have underlying malignancy. Take a full systematic history.
- In the young patient with unilateral oedema of slow onset, always consider lymphoedema. Lymphoedema does not pit.

LEG ULCERS

An ulcer is a discontinuity of an epithelial surface. Leg ulcers are common and the site of an ulcer on the leg may provide a clue to its aetiology.



Figure 43 Venous stasis ulcer. The ulcer is in a characteristic position on the distal medial aspect of the lower limb.

CAUSES

INFECTIVE

- Syphilis
- TB ● (common where TB is endemic)

NEOPLASTIC

- Squamous cell carcinoma
- Malignant melanoma
- Basal cell carcinoma

VASCULAR

- Venous stasis ulcers (Fig. 43)
- Arterial (ischaemic) ulcers
- Arteriovenous fistulae