Femoral Nerve Lesion

Damage to the femoral nerve may result from trauma, iatrogenically, or as a consequence of disease processes. Disruption may be complete or partial.

Epidemiology

Femoral nerve lesions are uncommon. One study of 27,004 primary hip arthroplasties found only two patients with complete and one with partial femoral nerve palsy. A review of cases treated surgically at a neurosurgical department found 119 patients over a period of 33 years. 52 cases were iatrogenic, 19 were due to hip or pelvic fractures, 10 to gunshot wounds and 8 to lacerations. The remainder were the result of various tumours or cysts.

Causes

- Iatrogenic:
  - Hip arthroplasty.
  - Abdominopelvic operations (particularly where self-retaining retractors are used).
  - Abdominoplasty.
  - Compression or stretching during obstetric procedures.
  - Pelvic surgery.
  - Coronary angiography.

- Trauma - hip or pelvic fractures, thigh lacerations (these are often partial lesions, affecting nerve supply to the quadriceps).
- Psoas haematoma - can occur as a complication of anticoagulant therapy or in haemophilia.
- Psoas abscess.
- Diabetic amyotrophy (proximal neuropathy, seen in patients with diabetes, causes burning pain in the hip and thigh and wasting of thigh muscles).
- Tumours - a variety of benign and malignant tumours - eg:
  - Synovial cyst.
  - Sarcoma.

- Arthropathy - femoral nerve palsy secondary to synovitis of the hip joint.
- Neonatal - femoral nerve palsy has been reported after breech lie in utero.

Presentation

Symptoms

There may be instability of the knee (often described as 'buckling') on climbing stairs. The weakness is typically acute or subacute, in contrast to that caused by myopathy, in which the onset is often gradual and usually bilateral. Numbness of the medial side of the leg and calf may occur. Involvement of the lateral cutaneous branch of the nerve may produce painful paraesthesiae of the thigh (meralgia paraesthetica). Mild pain near the inguinal ligament may be experienced. Acute severe pain in the groin, thigh and lower abdomen may occur if the cause is a retroperitoneal haematoma.
**Signs**\(^{[12]}\)

These may include:

- Quadriceps muscle weakness and wasting.
- Loss of knee jerk.
- Numbness along the medial side of the thigh and anteromedial side of the calf (the L2-L4 dermatomes - see figures below).
- Pain on hip extension (in cases of retroperitoneal haematoma).

In one small study after gynaecological surgery, diagnosis was made based on the following criteria:\(^{[13]}\)

- History of falling during postoperative ambulation.
- Quadriceps weakness.
- Straight leg raise weakness.
- Diminished knee jerk response.
- No evidence of psoas haematoma or abscess.
Differential diagnosis\textsuperscript{[14, 15]}

- Dermatomyositis/polymyositis.
- Diabetic neuropathy.
- Focal muscular atrophies.
- HIV-1-associated multiple mononeuropathies.
- Inclusion body myositis (a group of hereditary disorders causing muscle weakness in which inclusion bodies are seen on microscopy of muscle cells).
- Leprosy.
- Leptomeningeal carcinomatosis.
- Metabolic myopathies.
- Polyarteritis nodosa.
- Sarcoidosis.
- Systemic lupus erythematosus.
- Vasculitic neuropathy.
- Lumbar plexopathies (peripheral neuropathy in the area of the lumbar plexus).
Lumbosacral disc syndromes.

Investigations

Imaging
A CT scan of the abdomen may help to exclude retroperitoneal haematoma if this is suspected. CT or MRI imaging of the pelvis may also help to elucidate the cause (eg, tumour or aneurysm).

Other tests
- Nerve conduction studies may reveal motor deficit.
- Electromyography may show quadriceps weakness. Iliopsoas involvement may be demonstrated in pelvic lesions (ie above the inguinal ligament).

Management

Medical
Most patients can be treated conservatively with exercises, avoidance of excessive external rotation and abduction of the hip and with knee bracing.

Medical treatment depends on the underlying cause and this may include chemotherapy for an underlying tumour, immunotherapy for a diabetic or vasculitic cause and neuropathic pain medication (eg, pregabalin, gabapentin, amitriptyline).

The successful use of permanent percutaneous femoral nerve stimulation using a stimulating lead placed close to the femoral nerve with the aid of ultrasound guidance has been reported.

Surgical
Surgical procedures which may be required include:
- Drainage of a psoas haematoma or abscess.
- Treatment of a tumour.
- Surgical decompression of the nerve.
- Surgical exploration for other reasons (eg, penetrating wounds).
- Nerve grafting after tumour excision.
- Successful transfer of the obturator nerve to the femoral nerve has been reported.

Prognosis
Prognosis depends on the underlying cause. Most cases resolve spontaneously or with the aid of physical therapy. Symptoms caused by compression or stretching (eg, obstetric) can take three to four months to settle. Some patients are left with permanent residual neurological deficits.

Further reading & references

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