Erb's Palsy

Synonyms: Erb-Duchenne paralysis

Erb's palsy is caused by damage to the brachial plexus during delivery of the neonate. This is mostly limited to the 5th and 6th cervical nerves.

**Epidemiology**
- It is rare. In the USA the incidence has been quoted as 1.6-2.9 per 1,000 live births.\[^1\]
- Upper plexus palsies are more common than lower plexus palsies.
- 50% of cases are associated with shoulder dystocia.

**Risk factors**

<table>
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<tr>
<th>Fetal factors</th>
<th>Maternal factors</th>
<th>Factors related to labour</th>
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<tbody>
<tr>
<td>Macrosomia</td>
<td>Maternal propulsive forces</td>
<td>Lateral traction exerted on head and neck during delivery in vertex presentation</td>
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</table>

Raised maternal BMI at term and presence of gestational diabetes mellitus have also been reported as risk factors.\[^2\] The same study reported high birth weight, long second stage of labour, Afro-Caribbean background and long deceleration phase of labour as other prominent risk factors.\[^2\]

**Presentation**

The infant is unable to:
- Abduct the arm from the shoulder.
- Rotate the arm externally from the shoulder.
- Supinate the forearm.

This results in the classic 'porter's tip' or 'waiter's tip' appearance.\[^1\]

**Clinical signs**
- Characteristic position - adduction and internal rotation of the arm with the forearm pronated.
- Forearm extension is normal.
- Biceps reflex is absent.
- Moro reflex is absent on the affected side.
- Sensory impairment on the outer aspect of the arm (unusual).
- Power of the forearm is normal (if impaired, it suggests injury to the lower part of the plexus).
- Hand grasp is normal unless the lower part of the plexus is also damaged.

**Investigations**
- MRI shows nerve root damage
- Electromyogram (EMG) and nerve root studies are not helpful in determining the extent of the damage severity.\[^1\] This has, however, been opposed.\[^3\]

**Differential diagnosis\[^4\]**

Other causes of abnormal posturing in newborns:
- Klumpke's paralysis
- Clavicle fracture
- Fractured humerus
- Cerebral palsy
Management

- Intermittent immobilisation and positioning to prevent contractures.
- Positioning such that arm is abducted to 90°, externally rotated at the shoulder, supination of forearm, extension at wrist with the palm turned toward the face.
- Gentle massage.
- Physiotherapy with active and passive movement exercises by the end of the first week.
- Electrical stimulation may prove to be beneficial.\(^5\)
- Referral to a neurosurgeon if paralysis persists beyond three months or there is more proximal damage to the plexus.\(^1\)
- Surgery can involve direct neurorrhaphy after neuroma resection, neurolysis to remove any scar tissue, nerve grafting with transplant of another nerve or nerve transfer from a local functioning nerve; however, results are mixed and pain, along with functional disability, persist in significant numbers.\(^3\)

Prognosis

- Depends upon the degree of damage.
- Effective hand grasp throughout is associated with a good prognosis.
- Function may return within a few months.
- Some may have been left with permanent damage.

History

Named after Wilhelm Heinrich Erb (1840-1921), a German neurologist who described a case in 1874, although an earlier case was described by Duchenne in 1872. However, Erb was also a pioneer in a description of the electrophysiological nature of tetany, characterisation of the physiological response to stimulation of the superior root of the brachial plexus, and describing the deep tendon reflex.\(^6\)

Further reading & references


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