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

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<th>Fetal factors</th>
<th>Maternal factors</th>
<th>Factors related to labour</th>
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<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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<td>Arm extended overhead in breach presentation</td>
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<td>Excessive traction placed on shoulders during delivery</td>
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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. This has, however, been opposed.

**Differential diagnosis**

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.
- Referral to a neurosurgeon if paralysis persists beyond three months or there is more proximal damage to the plexus.
- 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.

**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.

**Further reading & references**


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