

## Erb's palsy

*Synonyms: obstetric brachial plexus injury, neonatal brachial plexus injury*

### What is Erb's palsy?

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.

### How common is Erb's palsy? (Epidemiology) <sup>[1]</sup>

- Obstetric brachial plexus injuries are uncommon, with an incidence of 0.42 per 1000 live births in the UK, but with 25% of those affected being left with permanent disability without intervention.
- 50% of cases are associated with shoulder dystocia.

### Risk factors <sup>[1]</sup>

Risk factors associated with injury include [shoulder dystocia](#), a high birth weight (above 4 kg), prolonged labour, breech alignment and forceps delivery.

### Erb's palsy symptoms (presentation) <sup>[1]</sup>

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. <sup>[2]</sup>

### 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<sup>[3]</sup>

The current gold standard for delineating the nerve injury is surgical exploration, and synchronous reconstruction is performed if indicated.

Magnetic resonance imaging (MRI) is a non-invasive method of assessing the anatomy and severity of nerve injury in obstetric brachial plexus injury but the diagnostic accuracy is unclear.

## Differential diagnosis<sup>[4]</sup>

Other causes of abnormal posturing in newborns:

- Klumpke's paralysis.
- [Clavicle fracture.](#)
- [Fractured humerus.](#)
- [Cerebral palsy.](#)

## Erb's palsy treatment and management<sup>[1]</sup>

- 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.
- Data supports the effectiveness of botulinum neurotoxin for obstetric brachial plexus injury. However, definite conclusions cannot be drawn due to small study sizes and the lack of randomised controlled trials. Therefore, more research is warranted to clarify the effectiveness of botulinum neurotoxin.<sup>[5]</sup>
- Nerve reconstruction is indicated when spontaneous recovery is absent or severely delayed.<sup>[6]</sup>
- 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.<sup>[7]</sup>

## 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.<sup>[8]</sup>

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## Further reading

- [Van der Looven R, Le Roy L, Tanghe E, et al](#); Risk factors for neonatal brachial plexus palsy: a systematic review and meta-analysis. *Dev Med Child Neurol.* 2020 Jun;62(6):673–683. doi: 10.1111/dmcn.14381. Epub 2019 Oct 31.

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