Case report

A term female infant was delivered after an uneventful pregnancy and labor. Delivery was complicated by shoulder dystocia and the infant was noted to have a left upper extremity palsy. There was no Horner syndrome. EMG confirmed the diagnosis of a left C5-C6-C7 injury. Despite intensive physical therapy, follow-up at the age of 5 months showed no biceps muscle function.

Consecutive imaging studies were performed at our department. An MRI at the age of 5 months showed a pseudomeningocele at the level C7-T1 with a root avulsion of C8 on the left side (Fig. 1). Hence a surgical intervention was required. At the age of 6 months she was treated with peripheral nerve grafting followed by several months of multidisciplinary therapy for optimizing shoulder outcome. A partial motor functional recovery of the left upper limb was observed during this period.

At the age of 3 years and 2 months, a radiograph of the shoulders demonstrated glenohumeral dysplasia of the left shoulder (Fig. 2). A subsequently performed MRI confirmed a posterior subluxation of the left shoulder, glenohumeral deformity and severe atrophy and fatty degeneration of the supraspinatus, infraspinatus and subscapularis muscles (Fig. 3).

Discussion

Brachial plexus injury (BPI) is the most common cause of plegic arm in the neonatal period. It occurs in 0.4 to 4 per 1000 live births per year (1). It is most commonly a complication of shoulder dystocia, which is impaction of the infant’s anterior shoulder behind the maternal symphysis pubis. Lateral traction on the head in attempt to deliver the infant, stretches the brachial plexus. This may result in various types of injuries to the nerves, from a mild stretch injury up to avulsion of the nerves from the spinal cord.

The brachial plexus supplies sensory and motor innervation to the upper limb. It forms from the ventral rami of the C5 through T1 spinal nerves. The majority of obstetric brachial plexus injury involve the 5th-7th cervical nerve roots, clinically recognized as an ‘Erb’s palsy’. The affected limb is positioned in the...
Valuable for treatment strategy, MRI and intraspinal nerve lesions is most. Studies are used for evaluation of the child grows (3, 4).

Head may occur, worsening as the shoulder is used to evaluate osseous deformities of the glenohumeral joint. Conventional radiography of the shoulder is used to evaluate osseous deformities of the glenoid fossa and humeral head.

Conventional radiography of the shoulder is used to evaluate osseous deformities of the glenoid fossa and humeral head in long-term follow-up.

References

Conclusion
Brachial plexus injury is the most common cause of a plegic arm in the neonatal period. MRI is the imaging modality of choice for evaluation of brachial plexus lesions. MRI allows detection of nerve lesions such as root avulsions or nerve ruptures, pseudomeningoceles, neuramas, or scarring and visualizes secondary deformities of the shoulder joint.

Conventional radiography of the shoulder is used to evaluate osseous deformities of the glenoid fossa and humeral head.

MR is the modality of choice for imaging the brachial plexus in infants as it allows visualization and localization of different types of nerve lesions, such as root avulsions or nerve ruptures, in a noninvasive way and without radiation exposure.

Avulsions are often associated with pseudomeningoceles -iso-intense to cerebrospinal fluid-, which occur after disruption of nerve root sleeves allowing cerebrospinal fluid to extrude from the subarachnoid space. Nevertheless, pseudomeningoceles can be isolated injuries with intact nerve roots. Avulsion is likely when images in at least two planes fail to demonstrate continuous roots (2, 3, 5).

MRI demonstrates enhancement and thickening of nerve roots which might represent neuroma or scar tissue. After (in)complete nerve ruptures, a neuroma is formed. A post-traumatic neuroma is a disorganized proliferation of regenerating axons at the proximal stump of the transected nerve. It can be recognized using MRI as a fusiform mass. Perineural fibrosis of the brachial plexus can be distinguished as thickening of plexial structures with ragged borders (2, 3, 5).

In addition, MRI can also assess dysplasia of the glenohumeral joint, subluxation or dislocation of the humeral head and rotator cuff muscle pathology.

For long-term follow-up conventional radiography of the shoulder allows evaluation of osseous deformities of the glenoid fossa and humeral head. Conventional radiographs are also of value in the newborn to demonstrate associated lesions such as fractures or luxations of the humerus, clavicle or cervical spine (3, 4).

References