Ultrasonographic features of brachial plexus traumatic rupture

Case illustration

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Early detection and accurate characterization of individual nerve root lesions have substantial impact on planning surgical strategy and prognosis of traction injuries of brachial plexus.2 This 25-year-old man presented 3 months after a snowboarding accident with functionless left biceps, deltoid, supraspinatus, and infraspinatus muscles, indicating a lesion of the left C5–6 root. Nerve conduction studies showed a complete lesion of C5–6. Magnetic resonance (MR) tomography scanning revealed a hematoma and edema along the course of the brachial plexus, with no further characterization of the plexal lesion regarding its site or extent. The patient underwent follow-up ultrasonography that revealed a rupture of the C-5 and a fusiform swelling of C-6 nerve roots (Fig. 1), both approximately 2 cm distal to the intervertebral foramen. Ultrasonographic evaluation of the brachial plexus was performed using a broadband 5- to 12-MHz linear array transducer. It was applied axially to the lateral side of the neck, and after determining the location of the transverse processes, the transducer was turned longitudinally to scan the course of plexal roots. Intraoperative nerve inspection disclosed a complete rupture of C-5 and a fusiform intraneural traction neuroma of C-6 (Fig. 2).

Although computerized tomography (CT) myelography and MR imaging enable the detection of cervical nerve root avulsion in brachial plexus injuries,2,3 the former is invasive and the latter is susceptible to motion artifacts in patients suffering from deafferentation pain. Ultrasonography is considered fast, noninvasive, and feasible for evaluating peripheral nerves1 and brachial plexus.4,5 Because the transducer position is flexible, the brachial plexus can be tracked through its oblique course from nerve roots to the periphery to identify lesions. The present case illustrates the diagnostic potential of ultrasonography for detecting intradural nerve root lesions. It can be used to differentiate between complete root rupture by demonstrating the retracted root and the empty epineural bag and the partial root rupture can be demonstrated by the traction neuroma, the visualization of which may be difficult on CT myelography and MR imaging.

References


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