

Ultrasound Imaging for an Uncommon Cause of Shoulder Pain: Metastatic Brachial Plexopathy in a Woman with Breast Cancer

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Dear Editor,

A 42-year-old female had a history of breast cancer. She complained of the left shoulder pain for the past 6 months. She was treated as a frozen shoulder initially in a rehabilitation clinic due to progressively limited shoulder range of motion. Since physical therapy was not helpful, she was referred for a shoulder ultrasound (US) examination. The prescanning physical examination showed only 50% of normal shoulder motion range in all directions and weakness in the shoulder abduction, elbow flexion, and the hand grasping strength. There were no symptoms such as Horner syndrome or paresthesia at her upper extremity. As there was no remarkable US finding of rotator cuffs, the transducer was relocated more proximally to investigate the supraclavicular region. The brachial plexus appeared diffusely swollen in contrast to that at the contralateral side [Figure 1]. The enlarged nerve bundles could be visualized all the way back to the root level. Brachial plexopathy due to cancer metastasis was impressed and later confirmed by the magnetic resonance imaging (MRI). She did not receive a biopsy of the brachial plexus lesion. Subsequent radiochemotherapy was arranged, and she had a significant recovery of shoulder movement and strength 3 months later with concurrent physical therapy (range of motion exercise and shoulder girdle muscle-strengthening). The subsequent US images showed decreased sizes of the previous swollen nerve roots.

Pain over the shoulder girdles is a common initial presentation of metastatic brachial plexopathy.^[1] Pain usually aggravates during shoulder motion due to the stretching of the nerves at the affected region, leading symptoms sometimes mimicking adhesive capsulitis. Weakness and sensory changes conventionally develop over the upper limb innervated by the lower trunk, but the deficit might be trivial at the early stage

compared with the intense shoulder pain. Unlike adhesive capsulitis which has an evolution from painful freezing to a nonpainful frozen phase, patients with metastatic brachial plexopathy have progressive pain irresponsive to nonsteroidal anti-inflammatory drugs or physical therapy. In our case, limitation of range of motion in whole directions might result from adhesive capsulitis secondary to persistent shoulder pain. However, long-lasting shoulder pain without response to physical therapy is not a typical presentation of idiopathic adhesive capsulitis. The common cancers that incur metastatic brachial plexopathy comprise lung cancer, breast cancer, and lymphoma.^[1] Therefore, in patients with the history of preexisting or on-going malignancy, detailed physical and imaging studies are required to investigate whether the shoulder pain results from metastatic lesions or tumor direct invasion.

The diagnosis of metastatic brachial plexopathy currently relies on MRI or fluorodeoxyglucose (FDG)-positron-emission tomography (PET).^[2,3] A typical lesion on MRI reveals a perineural thickening and enhancement with possible intraspinal extension, whereas it on PET shows abnormal uptake of FDG along the brachial plexus. However, both imaging techniques are expensive and rarely used for screening.

The high-resolution US has emerged as a cost-effective imaging modality to depict peripheral nerve lesions.^[4] In our patient, it also helps in confirmation of rotator cuff integrity. In metastatic brachial plexopathy, the tumors diffusely infiltrate the nerve bundles and surrounding sheaths, yielding swollen nerve

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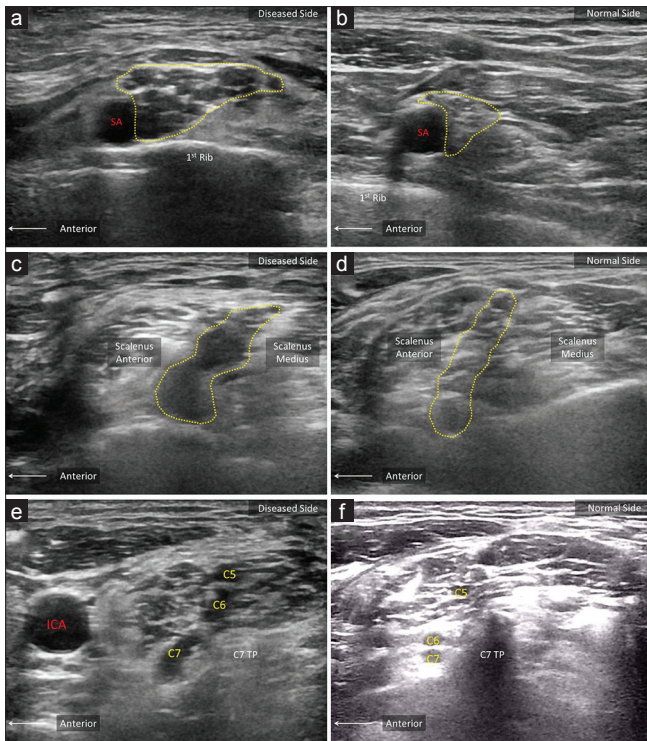


Figure 1: Diseased and normal brachial plexus (dashed area) at the supraclavicular (a and b), interscalene (c and d) and cervical root (e and f) levels; SA: Subclavian artery, ICA: Internal carotid artery, TP: Transverse process

cords with the loss of inner fibrillary patterns.^[4] In contrast, in radiation-induced plexopathy, the size of nerve bundles is usually normal or smaller but with increased perineural connective tissue, which can be used for distinguishing from the metastatic cause.^[4] This case highlighted the usefulness of US in differentiating uncommon causes of shoulder pain in patients with a positive cancer history.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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