Visualizing nerve fibers surrounding a brachial plexus tumor using MR diffusion tensor imaging

Figure Tractography of a right C4 nerve schwannoma

T1 postcontrast reveals an enhancing right C4 schwannoma (A). Tractography demonstrated nerve fibers surrounding the tumor (B, C) with thinning along the anterior face (white arrows); findings confirmed on electrophysiologic mapping (D; purple markings). The tumor was incised in the fiber-free zone (E) and removed in a single piece (F).

A 25-year-old man developed a growing neck mass, and percutaneous biopsy yielded diagnosis of schwannoma. The patient underwent magnetic resonance (MR) neurography, including diffusion tensor imaging performed with RESOLVE at 3 tesla (Skyra; Siemens, Malvern, PA). Postprocessing and 3-dimensional tractography were performed in DSI studio (dsi-studio.labsolver.org).¹ MR neurography confirmed a mass arising from the right C4 nerve (figure, A). Tractography localized a potential window for surgical approach in the surrounding nerve fibers (figure, B and C). Intraoperative electrophysiologic mapping and microscopy findings (figure, D–F) precisely confirmed the imaging findings. Diffusion tensor imaging and tractography may be valuable in the preoperative workup of peripheral nerve tumors.^{2,3}

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