Fibrolipomatous hamartoma of the median nerve on CT

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Fibrolipomatous hamartomas are rare lesions with a pathognomonic appearance on MRI. I describe CT findings that parallel the pathognomonic description on MRI. While these lesions are typically evaluated on MRI, they may be discovered incidentally on a CT scan of the upper extremity. In addition, contraindications to MRI may require CT evaluation in some cases. The findings of soft tissue with components of isointense fatty signal splaying out the nerve fascicles described as pathognomonic on MRI may also be applied on CT. While there is no surgical pathology of the lesion in this case, these lesions are not typically treated surgically. The pathognomonic findings on MRI can also be reproduced reliably on CT. Knowledge of these findings on CT can prevent unnecessary biopsy.

Case report

A 54-year-old renal-transplant patient presented with hand swelling. X-rays were unremarkable, except for vascular calcifications. Axial CT images were obtained at 2mm increments (Fig. 1A-C).

CT demonstrated an enlarged median nerve proximal to the carpal tunnel (Fig. 1A). At the level of the carpal tunnel, CT demonstrated separation of the nerve fascicles by soft tissue with a component of fatty density isodense to subcutaneous fat (Fig. 1B). Distal to the carpal tunnel, CT demonstrated dorsal displacement of the flexor tendons and enlargement of the median nerve (Figs. 1C and 2). In addition, the nerve bundles splayed out to their respective digits with innumerable fascicles separated by fat (Figs. 1C and 3). Surgical management was deemed unnecessary, as the patient had no carpal tunnel symptoms or parasthesias. The patient had no further followup.

Discussion

Fibrolipomas are uncommon; however, when they occur, they are seen almost exclusively in the median nerve, particularly in the carpal tunnel. They typically occur in the first three decades. They are benign, slow-growing lesions that can produce carpal tunnel symptoms. Motor and sensory deficits can present, with pain, weakness, and paresthesias. MRI is diagnostic and can be used for presurgical planning in symptomatic patients. When the lesions are...
asymptomatic, the diagnostic appearance on MRI can obviate biopsy. I present a case of fibrolipoma on CT with cross-sectional imaging findings of soft tissue with components of fat signal intensity and splayed-out nerve fibers—features identical to those seen on MRI. These findings on CT, as in MRI, may obviate biopsy when the patient is asymptomatic. In symptomatic patients, where a contraindication to MRI exists, CT can be of diagnostic value, as cross-sectional imaging findings of fatty and soft-tissue infiltration deemed pathognomonic on MRI would also be diagnostic on CT.

This case was somewhat unusual in that it extended into the digital nerves, well beyond the carpal tunnel. The most prevalent theory regarding histology of hamartomas is that mature fat cells and fibroblasts in the epineurium undergo hypertrophy (1). The proportion of fat and fibrous tissue may vary. Fibrolipomatous hamartomas are associated with macrodystrophia lipomatosa in 20 to 66% of cases (2, 3).

Very little is written about the appearance of fibrolipoma on CT. One report describes areas of solid soft tissue and areas of fat (4). The MRI literature, however, provides a more comprehensive analysis of the imaging findings for these lesions. Fibrofatty tissue infiltrates the nerve bundles, causing them to appear discrete and separated from one another. The "coaxial-cable" (on axial MRI) and "spaghetti-like" (on coronal MRI) appearance has been described (2, 5). This appearance in the median nerve was found to be specific for fibrolipomatous hamartoma and has been deemed pathognomonic on MRI (2, 5), thus obviating biopsy (6). I report a similar appearance on CT (Figs. 1-3); this classic appearance on cross-sectional imaging, coupled with density measurements of fat on CT scan, is virtually pathognomonic. To my knowledge, no other lesion has been described with this appearance. Most of
these other lesions will not have fat density; of those that do, the encapsulated lipoma is homogeneous and would not permeate the peri- and endoneurium and separate the nerve bundles (2). An infiltrating lipoma can show an admixture of fatty and fibrous tissue; however, this occurs within muscle and not nerve tissue.

Because the lesion engulfs the nerve bundles, complete excision is not feasible without damaging the nerve. When the lesion is symptomatic, various treatment options have been proposed, ranging from radical excision with nerve graft interposition, to interfascicular microdissection, to carpal tunnel release. Followup in cases that required surgery to alleviate symptoms demonstrated stabilization of sensory impairment; however, two-point discrimination was often impaired (7).

Differential diagnosis for fatty lesions would include lipoma, liposarcoma, and infiltrating lipoma. None of these lesions would permeate the peri- and endoneurium and separate the nerve bundles in the way that fibrolipomatous hamartomas of the median nerve do. Nerve lesions, such as schwannomas or neurofibromas, would have a fusiform appearance and might demonstrate a target sign with low signal centrally; however, these entities would not demonstrate fatty infiltration of the median nerve.

Fibrolipoma of the median nerve can be diagnosed on noncontrast CT alone when pathognomonic findings, as previously reported on MRI, are present. Its morphology is coaxial-cable-like, with fibrofatty tissue splaying out the nerve bundles. Knowledge of these findings can prevent unnecessary biopsy. This would be particularly useful for patients who are having CT scan because MRI is contraindicated, or for patients having CT for other reasons where the lesion is incidentally detected.

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