Radiology Case Reports 13 (2018) 380–385

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://Elsevier.com/locate/radcr

Musculoskeletal

Magnetic resonance neurography in the diagnosis of a retroperitoneal ganglioneuroma: Case report and literature review

Cláudio Régis Sampaio Silveira MD[a,*], *Clarissa Gadelha Maia Vieira MD*[b], *Brenda Machado Pereira MD*[b], *Edson Lopes Junior MD*[c], *Gunter Gerson MD*[d], *Daniel Gurgel Fernandes Távora MD*[b], *Avneesh Chhabra MD*[e]

[a] *Musculoskeletal Imaging Division, São Carlos Imaging/São Carlos Hospital, Fortaleza, CE, Brazil*
[b] *São Carlos Imaging, Rua Otoni Façanha de Sá, 69, Dionísio Torres, Fortaleza, Ceará, Brazil*
[c] *Neurosurgery Department, Geral Hospital of Fortaleza, Fortaleza, CE, Brazil*
[d] *Pathology Department, Federal University of Ceara, Fortaleza, CE, Brazil*
[e] *Radiology & Orthopaedic Surgery, UT Southwestern, Dallas, Texas*

ARTICLE INFO

Article history:
Received 20 November 2017
Accepted 26 December 2017
Available online

Keywords:
Ganglioneuroma
Lumbosacral plexus
MRI
MRN

ABSTRACT

Magnetic resonance neurography is a technique for identifying anatomy and pathologic lesions of nerves, and has emerged as a helpful technique for localizing lesions and elucidating the underlying etiology. Ganglioneuromas are highly differentiated benign tumors. This lesion is rare and exhibits undetermined symptoms, the features of using the magnetic resonance neurography are a great ally to determine its diagnosis. The authors illustrate a case of retroperitoneal ganglioneuroma emphasizing its image characteristics using magnetic resonance neurography with the diagnosis confirmed by histopathological examination.

Introduction

Technical aspects of magnetic resonance neurography (MRN) have been recently reviewed. Modern MRN uses high magnetic field strength (1.5 or 3 T) with high-resolution multiplanar structural sequences allowing the multiplanar representation of the lesions and demonstrates the relationships of the involved and displaced nerve roots. MRN can help localize lesions by directly observing nerve signal abnormalities, heterogeneous enhancement after the contrast, or by identifying myopathic changes in a particular nerve distribution; detect

Competing Interests: The authors have declared that no competing interests exist.
Disclosures: A. Chhabra receives royalties from Wolters and Jaypee. A. Chhabra also serves as a consultant with ICON Medical.

* *Corresponding author.*
E-mail address: claudiosilveira@hotmail.com (C.R.S. Silveira).

https://doi.org/10.1016/j.radcr.2017.12.010

incidental lesions mimicking neuropathic symptoms; or exclude neuropathy by revealing completely normal imaging characteristics of both muscle and nerve [1].

Neuroblastoma, ganglioneuroblastoma, and ganglioneuroma (GN) can be conceptualized as 3 maturational manifestations of a common neoplasm. GN is a differentiated ganglionic tumor that contains no immature neuroblastic elements [2].

GN, composed of mature ganglion cells, Schwann cells, and nerve fibers, is a rare tumor of neural crest origin in adolescence or young adulthood and can arise from the sympathetic ganglia and the adrenal medulla [3]. The 2 most common sites for GN are the retroperitoneum and the posterior mediastinum (approximately 90%), followed by the cervical region [4].

Since the appearance of neurographic sequences in the 1990s, MRN has become an essential part of the neuropathy diagnostic armamentarium. Because of technological advances through the development of new 3-dimensional (3D) imaging techniques, MRN is being increasingly used in the clinical routine for the evaluation of patients with plexopathies [5,6].

The authors illustrate an interesting case of retroperitoneal GN with histopathological and MRN appearances.

Case report

An 18-year-old woman sought emergency medical assistance in September 2015 with lumbar pain and progressive strength loss of lower limbs that had started 4 months ago. On physical examination, the patient was in good general condition, afebrile, oriented, and cooperative. On neurologic examination, she had bilateral paraparesis, asymmetric strength loss of the lower limbs, more accentuated on the right, and distally. There were also cauda equine symptoms of fecal retention and overflow urinary incontinence. Suspecting neurogenic cause, MRN of lumbosacral (LS) plexus was requested.

A high-field device (Philips Achieva 3.0T X-series magnetic resonance imaging (MRI) System; Philips Medical Systems, Best, The Netherlands) was used for LS plexus MRN. Spine and XL-torso coil were used with the following protocol: axial fast spin echo T1-weighted imaging, 3D volumetric T1- and T2-weighted imaging, axial spectral adiabatic inversion recovery T2-weighted imaging, 3D volumetric short tau inversion recovery imaging, 3D diffusion-weighted imaging (DWI), and 3D fat saturated (Fat-sat) T1-weighted gradient echo sequences both without contrast and after intravenous gadolinium injection. The images were post-processed at a workstation, and multiplanar reconstructions were generated using the thick-slab maximum intensity projection technique.

A large expansive neoplastic lesion occupying lumbar canal was seen from the middle of L1 vertebral body to the lower border of L4 vertebral body. The lesion was predominantly extradural (canalicular measurement—11.0 × 4.0 × 2.0 cm), presenting a heterogeneous hyperintense signal on T2-weighted and 3D short tau inversion recovery imaging, with low signal relative to the muscle signal on T1-weighted imaging (Figs. 1 and 2). On postcontrast imaging, there were areas of mild postcontrast heterogeneous and peripheral enhancement (Fig. 3). The lesion appeared multilobulated with smooth erosions and scalloping of the L2-4 vertebrae and multiple lumbar foramina (right > left). The dural sac was compressed and displaced anterolaterally to the left, the L1-3 nerves were engulfed, and L4-5 were displaced inferiorly (Fig. 4).

The lesion also presented a large right paravertebral component involving the ipsilateral psoas muscle with superior and anterolateral deviation of the right kidney and its ureter and slight ureteropelvic ectasia upstream. The measurements of right paravertebral component of the lesion are estimated to be 12.5 × 7.0 × 7.0 cm (Fig. 5).

The histopathological study of the surgical specimen showed a solid, well-circumscribed, and compact tumor lesion with a brown and white, firm, and homogeneous cut surface. Microscopic analysis revealed biphasic neoplasia composed of scattered ganglion cells and grouped between abundant axonal

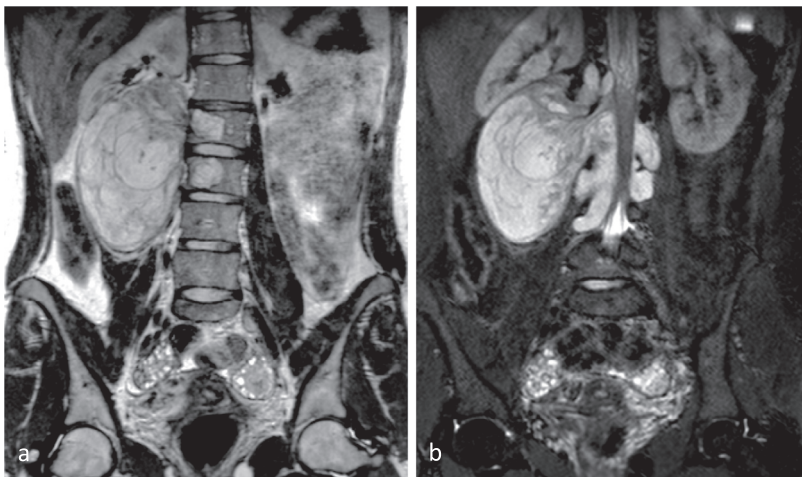

Fig. 1 – (A) T2-weighted 3-dimensional (3D) acquisition coronal and (B) 3D short tau inversion recovery coronal with reconstructions of the expansive lesion occupying the vertebral canal and the paravertebral component presenting a hyperintense heterogeneous signal with extensions into multiple neural foramina.