Unusual degenerated disc migration along sacral nerve root into neural foramina up to pelvic cavity

Sir,
Lumbosacral disc degeneration and extrusion are common pathologies encountered in neurosurgical practice. The disc migration is commonly seen in anterior epidural space and rarely in posterior epidural space. The yielding nature of epidural space due to its fat and venous plexus composition favors disc migration into this space. Rare cases of disc extending into intradural space via transdural migration are reported. Sequestrated discs can mimic a tumor\(^1\) or a facet cyst.\(^2\) We describe an unusual pattern of fluid-like migration of disc along the sacral nerve roots into neural foramina up to pelvic cavity.

A 39-year-old female patient who had mild low back pain of 1-year duration, presented with sudden severe worsening of back pain since 1 week, associated with radiating pain along the left lateral thigh, leg, as well as along the dorsum of foot. She also had numbness and reduced sensation along the left lateral aspect of thigh, lateral aspect of leg, and dorsum of foot. She was unable to walk due to weakness in left lower limb. She had received analgesics in a local hospital with a good relief of pain; however, other symptoms remained unchanged. Her neurological examination revealed mild-to-moderate weakness of all movements around the left hip, ankle, and knee; weak knee flexors; and weak extensor hallucis longus. Sensory deficits were characteristically along the left S1 dermatome with a flexor plantar response. Rest of the neurological examination was normal. Straight leg raising test was positive. Her lumbosacral magnetic resonance imaging (MRI) revealed disc desiccation and bulge at L5-S1 level [Figure 1], with left paramedian disc protrusion and extrusion extending along the anterior aspect of left S1 nerve root, into the left S1–S2 neural foramina up to the pelvic cavity [Figures 2 and 3]. The extruded disc in the neural foramina was a small component, grossly not visible separately from the nerve root, hence the lesion was initially mistaken for a thickened S1 nerve root in thick section T1-weighted (W) and T2W images. However, thin section axial T2W images revealed the extruded disc material visible as a hypointense structure plastering the anterior surface of the isointense S1 nerve root. The nerve conduction study of lower limbs was normal. As there was good clinical-radiological correlation, she underwent a left L5-S1 foraminotomy, partial drilling of the facet, and excision of the extruded disc. The intraoperative findings correlated with the exact MRI appearance. The excised material was sent for histopathological examination and was reported as degenerated disc material. As the disc was extending all along the S1 nerve root, significant surgical difficulty was encountered during its removal. A small portion of the disc in the distal part of the neural foramina and pelvic cavity was unreachable. Despite a small residual disc fragment being left within the neural foramina, during postsurgical period, her symptoms improved completely and she became ambulant. At the end of 2 months after surgery, she remained symptom free.

Degenerated disc migration commonly into the anterior, and less commonly, into the posterior epidural space is well known. Uncommonly, the disc can migrate transdurally into the intradural space,\(^3\) mimicking an intradural tumor. Epidural disc migration up to several centimeters distant from the original disc location is described. To the best of our knowledge, there

Figure 1: (A-C) Serial Lumbosacral spine sagittal T2w MR images from right to left side, showing an isointense right S1 nerve root in the S1-2 neural foramina (black arrow), the corresponding isointense left S1 nerve root (thin white arrow), and the adjacent hypointense migrated disc (thick white arrow)
are no case reports of disc material migrating up to the pelvic cavity along the neural foramina. As the disc extends into the initial few millimeters of the neural foramina, increased resistance from soft tissue within the neural foramina redirects the migrating disc into the epidural space. In addition, a tough fibrous tissue covers the walls of the lumbosacral foramina and more lateral parts of the foramina are crossed by transforaminal ligaments. Unlike the epidural space, the neural foramina are nonyielding spaces constrained by bones, perichondrial fibers, and capsular ligaments, amounting to high resistance that prevents disc migration. A reduced foraminal space by disc degeneration/osteophytes/spondylolisthesis itself further increases intraforaminal pressure resisting disc migration into the neural foramina. The exact pathomechanism of disc migration in our case remains elusive.

Based on MRI findings, Lee et al., classified disc migration into four zones based on the direction and distance from the disc space, namely zone 1 (far up), zone 2 (near up), zone 3 (near down), and zone 4 (far down). However, in our case, the disc migration was further beyond zone 4 (far down), as the disc was reaching the pelvic cavity. Unlike disc sequestration, the migrated disc was in continuation with the L5-S1 disc but was linearly elongated resembling the flow of liquid (probably being composed of nucleus pulposus, which is a jelly-like water-rich network of collagen fibers). Though the herniated disc did not appear to be compressing the exiting S1 nerve root, possible inflammation induced by the disc was hypothesized to be the cause of her severe pain. Initial thick section MRI appearance of inflammation of the S1 nerve root was mimicking neuritis/nerve sheath tumor. Our case also highlights the importance of thin section high-resolution MRIs in identifying the exact course of migrated disc, which can assist in surgery as well in the feasibility of endoscopic approach.

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Fibrous dysplasia with secondary osteosarcoma — A rare presentation of a common disease

Sir,

A 20-year-old male patient presented with complaints of headache for the past 3–4 years with a recent worsening. He also noticed decreased hearing in his right ear and decreased taste sensation on the right side of his mouth over the past 3–4 months. He had noticed double vision on looking towards his right side and episodic imbalance on walking since the past 15 days. On examination, he was alert and had intact higher mental function. Examination of the cranial nerves revealed impairment of the right seventh to lower cranial nerves. There were right-sided cerebellar signs.

Computed tomography (CT) scan of the brain showed a hyperdense, enhancing lesion of the right petrous-mastoid region extending in the cerebellopontine (CP) angle and clivus, associated with hyperostosis and compression of the brainstem. Magnetic resonance imaging of the brain revealed a T1 isointense, T2 hypointense, heterogeneously enhancing right petrous-mastoid lesion in the right CP angle suggestive of a “bony tumor.” The lesion was excised through a right retrosigmoid approach. The lesion was extradural and well defined. It had a bony core with a granular friable surrounding substance, which was yellowish-red, vascular, and not suckable. A sliver of tumor along the 7–8th complex and lower cranial nerves was left behind to achieve a near-total excision. Muscle tissue harvested from the local wound was placed over the thinned out dura to prevent the leakage of cerebrospinal fluid. Histology was suggestive of osteosarcoma in association with fibrous dysplasia (FD). He was sent for adjuvant chemotherapy and radiotherapy. After a few months of treatment, despite symptomatic relief, he was diagnosed with systemic metastasis and eventually expired within an year’s time.

FD is caused by an early embryonic postzygotic somatic activating mutation (nonhereditary) in the GNAS1 (guanine nucleotide binding protein, alpha stimulating activity polypeptide) gene (20q13.2). Bianco et al., demonstrated

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