Serpentine pattern nerve roots

Magnetic resonance imaging (MRI) scans of patients with lumbar spinal stenosis often present with thickened, serpentine pattern nerve roots (SNRs) or loop-shaped redundant nerve roots of the cauda equina. Studies have shown that the prevalence rates of SNRs among patients with LSS can range from 33.8% to 43.3% ^{1) (2) (3) (4)}

SNRs have been associated with the pathogenesis of spinal claudication in degenerative LSS, manifesting clinically as persistent low back and leg pain. SNRs were mostly observed above the stenotic level, but can also be found below, or both above and below the stenotic level ^{5) 6)}.

Several studies reported that patients with LSS and preoperative evidence of SNRs have a significantly longer mean duration of neurological symptoms and experience less improvement in their ability to walk after surgery compared to patients without SNRs ^{7) 8) 9)}.



Multifactorial lumbar spinal canal stenosis at the L2/L3 level with increased occupancy of the cauda equina fibers above this level with spondylolisthesis. Ligamentum flavum hypertrophy, and diffuse disc widening at the L3/L4 and L4/5 levels. L1/L2 protrusion.

study aimed to determine the relationship between the serpentine pattern nerve roots (SNR) and

prognosis after lumbar fusion for lumbar spinal stenosis (LSS) by comparing clinical outcomes in patients with or without a serpentine pattern. LSS patients with neurological symptoms often present with SNRs. Several studies have shown that LLS symptoms are worse in patients with SNRs. However, the relationship between SNR and outcome after spinal fusion surgery has not yet been established. A total of 332 patients who underwent spinal fusion surgery between January 1, 2010, and December 31, 2019, were enrolled. Patients were divided into those with a serpentine pattern (S group) and those without a serpentine pattern (N group). The prognosis of the 2 groups was compared using visual analog scale (VAS), Oswestry disability index, claudication distance, medication dose for leg dysesthesia, and glucose tolerance. A total of 113 patients had a serpentine pattern, while the remaining 219 did not. Symptom duration and presence of diabetes mellitus were significantly different between the 2 groups (N = 25.4, S = 32.6, P < .05). Changes in the VAS score for lower extremity pain between the 2 groups at 1 year after surgery showed that patients without a serpentine pattern had significantly better outcomes than those with a serpentine pattern (N: 2.7 \pm 1.1 vs S: 4.1 \pm 1.3; P < .001), despite the score change at 1 month showing no difference (N: 3.5 \pm 0.9 vs S: 3.8 ± 1.0 ; P = .09). SNRs on MRI are more prevalent in diabetic patients and are a negative prognostic factor in lumbar fusion surgery for LSS. Our insights may help physicians decide the optimal surgical plan and predict the postoperative prognosis of patients with LSS¹⁰.

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