Clinical Policy: Selective Dorsal Rhizotomy for Spasticity in Cerebral Palsy

Reference Number: LA.CP.MP.174 Coding Implications
Last Review Date: 08/2020 Revision Log

See Important Reminder at the end of this policy for important regulatory and legal information.

Description

Selective dorsal rhizotomy (SDR) is a neurosurgical technique developed to reduce spasticity and improve mobility in children with cerebral palsy (CP) and lower extremity spasticity. It involves the selective division of lumbosacral afferent (sensory) rootlets at the conus or at the intervertebral foramina under intraoperative neurophysiological guidance. Early procedures were effective at reducing spasticity but were associated with significant morbidity; however, technical advancements have reduced the invasiveness of the procedure, typically from a five-level laminoplasty to a single-level laminotomy at the conus.[4]

Policy/Criteria

I. It is the policy of Louisiana Healthcare Connections that s*elective dorsal rhizotomy* is medically necessary for children with spastic CP when meeting all of the following:
- A. Spastic diplegia, or spastic quadriplegia with no significant ataxia or dystonia;
- B. Gross Motor Function Classification System (GMFCS) level II or III;
- C. Age > 2 to < 10 years;
- D. No significant weakness;
- E. Functional and intellectual ability to participate in physical rehabilitation;
- F. Failure of or inability to tolerate other conservative treatment (e.g., pharmacotherapy, orthopedic management, physical therapy);
- G. No botulinum toxin A injection has been given within the last 6 months;
- H. No orthopedic surgery within the last year;
- I. No significant scoliosis;
- J. Periventricular leukomalacia (PVL) on MRI with no involvement of the thalamus, basal ganglia or cerebellum;
- K. Reimers index < 40%, (i.e. no significant femoral head subluxation on pelvic radiograph.)

II. It is the policy of Louisiana Healthcare Connections that *selective dorsal rhizotomy* is not medically necessary for children with spastic hemiplegia, or ataxic or athetoid spasticity.

Background

Cerebral palsy (CP) refers to a heterogeneous group of conditions involving permanent nonprogressive central motor dysfunction that affect muscle tone, posture, and movement. The average age at diagnosis for children with CP is 18 to 24 months. The motor impairment generally results in limitations in functional ability and activity, which can range in severity. Other symptoms include altered sensation or perception, intellectual disability, communication and behavioral difficulties, seizure disorders, and musculoskeletal complications. Although the underlying etiology itself is not progressive, the clinical expression may change over time as the nervous system matures.[2]

Spastic CP is characterized by muscle hypertonicity and impairment in motor skills. Spastic diplegia is one of the most frequently occurring forms of CP, with spasticity confined to the lower extremities. The gait pattern of those with spastic diplegia includes in-toeing steps, toe walking, scissoring, excessive trunk sway, and diminished walking endurance

Standardized measurement of an individual's functional status can help guide treatment selection and allows for monitoring of change over time. The Gross Motor Function Classification System (GMFCS) is used to categorize functional motor impairment in children with CP. Other widely used tools for evaluating function include the Manual Ability Classification System (MACS) and the Communication Function Classification System (CFCS). The goals of treatment for children with CP include improved motor function, increased mobility and independence, improvement in ease of care, reduction in pain and reduce extent of disability.

The Gross Motor Function Classification System (GMFCS) for ages 6 to 12 years (modified descriptions of these categories are used for younger age groups) [1]

- Level I: walks, climbs stairs without using a railing, runs in all setting, but has differences in coordination and balance
- Level II: walks with limitations, minimal ability to run, more challenges with coordination and balance
- Level III: walks using a hand-held mobility device (canes, crutches, and anterior and posterior walkers that do not support the trunk), may use wheeled mobility for longer distances
- Level IV: generally dependent on wheeled mobility, may be able to use power mobility independently, may walk short distances with support in familiar environments
- Level V: manual wheeled mobility with head/trunk support

Controlling spasticity is crucial in the treatment of CP as it causes discomfort, gait abnormalities, and functional limitations. It also generates muscle shortenings that influence bone growth and leads to deformities.[3] The approach to treating spasticity in children with CP is not standardized. Treatments may include pharmacotherapy (e.g., oral baclofen, benzodiazepines), nerve blocks (i.e., botulinum toxin and/or phenol injections), orthopedic management, physical (PT) and occupational therapy (OT) including use of braces, orthotics and mobility devices, SDR and intrathecal administration of baclofen.

An SDR may be performed in selected patients with a goal to permanently diminishing spasticity and improving motor function of the lower limbs. Younger children (age > 2 years to < 10 years) are generally optimal candidates for SDR since they are young enough to relearn appropriate motor patterns for ambulation. Patient selection should be rigorous, and active participation in therapies postoperatively is critical.

A meta-analysis of three randomized controlled trials comparing SDR plus PT with PT alone in a total of 90 children with spastic diplegia who were primarily ambulatory (most were <8 years old and most had a GMFCS level of II or III), spasticity at 9 to 12 months (assessed by the Ashworth scale) was less with SDR plus PT compared with PT alone. The SDR group had a modest, but statistically significant, improvement in motor function (assessed by the GMFM score), and this correlated with the proportion of dorsal root tissue that was transected. No serious adverse events

were reported. [5] Studies suggest that the beneficial effects of childhood SDR extend to adulthood quality of life and ambulatory function without late side effects of surgery. [12,13,14,15]

A recent review of the literature concluded that SDR plus postoperative PT improved gait, functional independence, and self-care in children with spastic diplegia. SDRs through multilevel laminectomies or laminoplasty were associated with spinal deformities (i.e., scoliosis, hyperlordosis, kyphosis, spondylolisthesis, spondylolysis, and nonhealing of laminoplasty), however, SDRs through a single level laminectomy prevented SDR-related spinal problems. The outcomes of SDR specific to spastic quadriplegia require further investigation because of the relatively small patient population with quadriplegia. [11]

The use of SDR in the setting of severe motor impairment (GMFCS level IV or V) is controversial. Severe spasticity and contractures cause significant discomfort and may interfere with sitting and general caretaking. In addition, often other comorbidities exist (e.g., intellectual disability, seizure disorder). The goal of surgery in this setting is to ease the difficulty of daily caretaking, to improve comfort, and improve stability in the seated position. SDR in those severely affected generally requires greater extent of nerve root division, and as a result may experience troublesome weakness.

National Institute for Healthcare and Excellence (NICE) [6]
Current evidence on selective dorsal rhizotomy for spasticity in cerebral palsy shows that there is a risk of serious but well-recognized complications. The evidence on efficacy is adequate. Therefore this procedure may be used provided that normal arrangements are in place for clinical governance and audit. Parents or caregivers should be informed that SDR for spasticity in CP is irreversible, and that patients may experience deterioration in walking ability or bladder function, and later complications including spinal deformity. They should understand that prolonged physiotherapy and aftercare will be required and that additional surgery may be necessary. This procedure and patient selection for it are still evolving with most of the evidence relating to children aged 4–10 years.

Coding Implications
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CPT® Codes	Description
63185	Laminectomy with rhizotomy; 1 or 2 segments
63190	Laminectomy with rhizotomy; more than 2 segments

HCPCS Codes	Description
N/A	

ICD-10-CM Diagnosis Codes that Support Coverage Criteria
+ Indicates a code requiring an additional character

ICD-10-CM Code	Description
G80.0	Spastic quadriplegic cerebral palsy
G80.1	Spastic diplegic cerebral palsy

Reviews, Revisions, and Approvals	Date	Approval Date
Converted corporate to local policy.	08/15/2020	

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Important Reminder

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