Patients with "Lumbar Stenosis" and Unrecognized Distal Thoracic Cord Compression

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Abstract

Study Design: This is a retrospective analysis of 3 patients with MR-documented lumbar spinal stenosis found to have myelopathy and distal thoracic cord compression.

Objectives: To emphasize that some patients lumbar stenosis/radiculopathy may also be myelopathic, and should undergo MR evaluations of the cervical/ thoracic spine.

Summary of Background Data: Patients presenting with the diagnosis of lumbar spinal stenosis supported by MR studies should be fully examined to determine whether thoracic myelopathy is superimposed on lumbar radiculopathy.

Methods: Three patients presented with MR-documented lumbar spinal stenosis/spondyloarthrosis, and ossification of the yellow ligament [OYL]. However, when all 3 also exhibited severe thoracic myelopathy/parapareses, they underwent thoracic MR/CT studies which documented; [1] T10/11 right-sided disc, and severe stenosis/OYL T9-T12 OYL [mild/moderate L3-S1 OYL was not operated upon-1 patient], [2] T9/10 and T10/11 synovial cysts, and severe stenosis T8-S1 OYL [1 patient], and [3] T10/11 synovial cyst and severe stenosis/OYL T10-S1 [1 patient].

Results: The first patient underwent a T10/11 right-sided discectomy, and T9-T12 laminectomy alone. Two patients had thoracic laminectomies for synovial cysts/OYL, and lumbar laminectomies for severe stenosis/OYL; T8-S1 and T9-S1. Utilizing Odom's criteria, 2 patients exhibited excellent outcomes 6 and 9 months, while 1 demonstrated a fair/good recovery [T8-S1 laminectomy] 3 months postoperatively.

Conclusions: A subset of patients with MR-documented lumbar spinal stenosis/radiculopathy may exhibit simultaneous thoracic myelopathy. Where thoracic cord compression is documented, thoracic/thoracolumbar laminectomies may become warranted.

Key words: distal thoracic cord compression

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INTRODUCTION

Patients are increasingly referred by internists or primary care physicians rather than by neurologist to spine surgeons with diagnoses of MR- or CT-documented lumbar spinal stenosis. Spine surgeons, therefore, must assiduously perform complete

neurological examinations to determine whether patients exhibit lumbar radiculopathy and/or myelopathy warranting more cephalad [cervical, thoracic] MR examinations. Here, 3 patients presenting with the diagnoses of lumbar radiculopathy/stenosis were found to have simultaneous myelopathy/distal thoracic cord

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Fig. 1: A 60-year-old male presented with a one-month history of severe paraparesis [0-1/5] attributed to T8-T12 OYL and T9/T10 and T10/T11 right-sided synovial cysts. This transaxial CT study confirmed the severity of left-sided OYL at the T10/T11 level [Case 3].

Fig. 2: A 70 year old female with thoracic paraparesis [2/5] exhibited, on the preoperative transaxial MR study, a T10/T11 right-sided anterolateral thoracic disc herniation in conjunction with T9-T12 congenital thoracic stenosis and OYL [Case 2].

Fig. 3: The same 70 year old female [Case 2] had a sagittal T2 weighted MR scan revealing both an anterolateral T10/T11 right sided disc herniation in conjunction with spinal stenosis and OYL resulting in dorsolateral cord compression at the T9/T10, T10/T11, and T11/T12 levels.

compression attributed to stenosis, ossification of the yellow ligament [OYL], synovial cysts, and/or a thoracic disc.

MATERIALS AND METHODS

Three patients, age 46, 60, and 70, presented with presumed lumbar radiculopathy attributed to MR/CT documented lumbar spinal stenosis: L1-S1 [2 patients], and L4-S1 [1 patient] [Table 1]. However, when the clinical examination revealed significant myelopathy for all 3 patients, including paraparesis [2/5 motor function-two patients] and even paralysis [0-1/5 motor function: one patient], cervical and thoracic MR studies were additionally performed. The cervical MR proved negative. The thoracic MR, however, and subsequent CT studies revealed marked distal thoracic cord compression attributed to stenosis, OYL, and either synovial cysts [2 patients: T10/T11 and T9/T10 and T10/T11], or disc herniations [1 patient; T10/T11] [Table 1] [Figs. 1-3]. All 3 patients underwent decompressive procedures.

RESULTS

Surgery included thoracolumbar laminectomies for two patients with stenosis, OYL, and synovial cysts [T9-S1, T8-S1] [Table 1]. The third patient with stenosis, OYL and a T10/T11 thoracic disc had a thoracic laminectomy alone [T9-T12] as her lumbar stenosis was not as severe [mild/moderate stenosis L3-S1]. Utilizing Odom's criteria, 2 patients exhibited excellent outcomes 6 and 9 months postoperatively, while the one patient with the most severe preoperative paraparesis shows a good/fair recovery 3 months postoperatively.

DISCUSSION

As more patients are directly referred to spine surgeons by internists and family practice physicians, bypassing neurologists, spinal surgeons are often the only ones performing complete neurological examinations. In addition to confirming the diagnosis

Table 1: Clinical Data for 3 Patients with Lumbar Stenosis and Myelopathy Associated with Thoracic Disease

Variable	Case 1	Case 2	Case 3
Age	46	70	60
Sex	F	F	M
Height	5'10"	5'4"	6'7"
Weight	185	200	310
Epidural Steroids	15 [5 years]	None	None
Trauma	Yes [Chiropractic]	None	Yes [Fall]
Symptom Duration			
Chronic	5 Years	40 Years	6 Months
Acute	2 Weeks	2 Weeks	1 Month
Neurological Deficits	Severe Paraparesis	Severe Paraparesis	Paraplegia
Motor Deficit	2/5	2/5	0-1/5 Pin L1 [R/L]
Pin Level: Bilateral	T12/L1	T11/T12	T11/T12
Sphincter Function	Intact	Intact	Hypertonic
Orthotic Device	Crutches	Crutches	Wheelchair
Lumbar Disease			
Stenosis	Marked L1-S1	Mild/Moderate L3-S1	Marked L1-S1
Grade I Olisthy	L2-L3	L4-L5	L4-L5
Thoracic Disease			
Myelomalacia	T10/T11	T9-T11	T9-T11
Disc	-	T10/11 [R]	-
Synovial Cyst	T10/11	-	T9/10, T10/11
OYL/Stenosis	T10-T12	T9-T12	T8-T12
Follow-Up Duration	9 months	6 months	3 months
Laminectomy	T10-S1	T9-T12	T8-S1
Postoperative MR			
Time Interval	9 mo	6 mo	3 mo
Myelomalacia	T10/11	T9-T11	T9-T11
Decompression	Adequate	Adequate	Adequate
Odom's Criteria	Excellent	Excellent	Fair/Good
Time Postoperatively	9 Months	6 Months	3 Months

of lumbar radiculopathy attributed to lumbar stenosis, spinal surgeons must increasingly determine whether a subset of patients also exhibit coexisting myelopathy attributed to thoracic cord compression [1]. In the 1970's, Epstein, Marc, Hyman et. al. performed complete myelograms [cervical, thoracic, lumbar] in 3 patients with the diagnosis of lumbar spinal stenosis, and found 3 thoracic tumors: 1 intramedullary astrocytoma, and 2 schwannomas [1]. Epstein and Schwall later reported that 7 out of a series of 9 patients diagnosed with primary thoracic stenosis [congenital] had coexisting lumbar stenosis [2].

The frequency of coexisting thoracic and lumbar spinal stenosis was underscored by Palumbo, Hilibrand, Hart et. al. in their series of 12 patients with thoracic stenosis, 8 of whom additional had significant lumbar stenosis [3]. Eight patients underwent simultaneous thoracolumbar decompressions, while only 4 had thoracic laminectomies alone. Postoperatively, pain [8 patients], motor deficits [10 patients], and ambulatory status [7 patients] improved over an average of 62.4 months. However, one patient became permanently paraplegic. The authors concluded that the optimal surgical procedure for patients with combined thoracic and lumbar stenosis was to address all stenotic levels simultaneously. In another series, 3 patients newly became paraplegic following lumbar decompressions for "slight" lumbar stenosis [4]. When postoperative MR and Myelo-CT studies documented significant thoracic pathology [spinal cord tumor, disc herniation, vertebral osteophytes, OYL] secondary thoracic laminectomies were performed. To avoid similar complications in the future, the authors advocated performing more initial thoracic studies where lumbar examinations demonstrated insufficient pathology. In one of the largest series of 23 patients with thoracic stenosis and OYL attributed to fluorosis, patients underwent thoracic laminectomies and often-simultaneous cervical and/or lumbar decompressions for coexisting stenosis [5]. The greatest predictor of poor outcomes was the acute onset or long duration of preoperative symptoms.

In the future, when the neurological examination reveals myelopathy superimposed on lumbar radiculopathy associated with documented lumbar

stenosis, further cervical and thoracic MR examinations looking for more cephalad cord compression may be warranted.

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REFERENCES

1. Epstein JA, Marc JA, Hyman RA, Khan A, Mardayat M: Total myelography in the evaluation of lumbar discs. With the presentation of three cases of thoracic neoplasms simulating nerve root lesions. *Spine* 4(2): 121-128, 1979
2. Epstein NE, Schwall G: Thoracic spinal stenosis: diagnostic and treatment challenges. *J Spinal Disord.* 7(3): 259-269, 1994
3. Palumbo MA, Hilibrand AS, Hart RA, Bohlman HH: Surgical treatment of thoracic spinal stenosis: a 2 to 9 year follow-up. *Spine* 26(5): 558-566, 2001
4. Takeuchi A, Miyamotor K, Hosoe H, Shimizu K: Thoracic paraplegia due to missed thoracic compressive lesions after lumbar spinal decompression surgery. Report of three cases. *J Neurosurg* 100(Suppl Spine): 71-74, 2004
5. Wang W, Kong L, Zhao H, , Dong R, Zhou J, Lu Y: Thoracic myelopathy caused by ossification of the ligamentum flavum of which fluorosis was an etiology factor. *J Orthop Surg* 1: 1-10, 2006

Reviewer's comment : Toshiaki Abe, M.D.**Department of Neurosurgery, Jikei University School of Medicine, Tokyo, Japan**

Dr. Epstein reported 3 cases of lumbar canal stenosis associated with cord compression at the level of distal thoracic region. She emphasized that some patients with lumbar stenosis may also have cord compression.

This is one of important pitfall to evaluate the elder patients with multiple spondylotic changes over the whole spine.

Reviewer's comment : Motoi Shoda, M.D.**Department of Neurosurgery, Fujita Health University, Aichi, Japan**

The article tackles a problem that every active spinal surgeon has faced at some moment in his practice. It is a real possibility for a long lasting lumbar stenosis radiculopathy to be covering any additional, and usually developing later and insidiously thoracic or cervical myelopathic presentation, making the symptoms and signs of the later difficult to recognize. The options for the spinal surgeons and those seeing the patients before them, have been two: to rely mainly on their ability to detect even minimal, unusual elements in the clinical picture and investigate further, or go for a more frequent, more often also negative, screening of the thoracic and/or cervical spine. The importance of detection of the concomitant problem is obvious not only for prognosis, but for the need to address both problems simultaneously. The article of Author has studied three such cases. The outcome for these patients has been successful, however for the completeness of the evaluation it could have been shown if any elements of instability have been excluded, much important issue in the extensive laminectomies that followed. It is also interesting to know if in the case with thoracic disc herniation the laminectomy has been complemented with additional bone removal. The article deserves the attention of all those dealing with the frequently seen lumbar canal stenosis and be published.