CASE REPORT

THORACIC MENINGIOMA IN COMBINATION WITH SEVERE LUMBAR SPINAL STENOSIS PRESENTING WITH ATYPICAL NEUROLOGICAL DEFICIT

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НЕТИПИЧНАЯ НЕВРОЛОГИЧЕСКАЯ СИМПТОМАТИКА В СЛУЧАЕ СОЧЕТАНИЯ МЕНИНГИОМЫ ГРУДНОГО ОТДЕЛА ПОЗВОНОЧНИКА С ВЫРАЖЕННЫМ ЛЮМБАЛЬНЫМ СТЕНОЗОМ

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ABSTRACT

We report on a case of a 47-year-old female patient with a long history of low back pain irradiating bilaterally to the legs. Twenty days before admission to our clinic, she had developed progressive weakness in the legs, more pronounced on the left side. The initial neurological examination revealed signs of damage to both the cauda equina and the spinal cord. The neuroimaging studies (computed tomography, myelography and magnetic-resonance tomography) found spinal stenosis most severe at L4-L5 level, and right lateral thoracic intradural-extramedullary tumor at T9-T10 level.

The patient underwent two neurosurgical procedures. The first stage included microsurgical resection of the thoracic lesion and the second stage aimed at decompressing the lumbar spinal stenosis.

To avoid missing a diagnosis of thoracic lesions, it is necessary to perform a thorough neurological examination of the spinal cord motor and sensory functions. In addition, further MRI examination of upper spinal segment is needed if the neuroimaging studies of the lumbar spine fail to provide reasonable explanation for the existing neurological symptoms.

Key words: spinal meningioma, lumbar spinal stenosis, contralateral paresis

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РЕЗЮМЕ

Представлен случай пациентки 47 лет с продолжающимися длительное время жалобами на боли в пояснице с распространением в обе ноги. За двадцать дней до поступления в клинику проявляется прогрессирующая слабость в нижних конечностях, более выраженная в левой ноге. Неврологический статус при поступлении установил показатели значительного нарушения как в отношении кауды эквины, так и спинного мозга. Проведённые обзорно-диагностические обследования (компьютерная томография, миелография и магнитно-резонансная томография) установили наличие выраженного люмбального стеноза, в наиболее тяжёлой форме на уровне L4-L5, а также и наличие право-латеральной экстрамедуллярной интрадулярной опухоли на уровне T9-T10.

Были проведены две оперативные интервенции. На первом этапе была проведена экстирпация менингиомы грудного отдела позвоночника, а на втором этапе была проведена и декомпрессия люмбального стеноза.

Во избежание неполного диагноза и возможного пропуска торакального поражения необходимо обязательно провести дооперационное тщательное неврологическое обследование моторных и сенсорных функций спинного мозга, а также дополнительное магнитно-резонансное обследование более верхнего

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сегмента позвоночника, в случае если обзорно-диагностические обследования в поясничной области не могут объяснить данную неврологическую симптоматику.

Ключевые слова: спинальная менингиома, люмбальный позвоночный стеноз, контралатеральный парез

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INTRODUCTION

Lumbar spinal stenosis (LSS) can sometimes be combined with concomitant lesions affecting the thoracic spine such as stenosis¹⁻³, disc herniation⁴, arachnoid cyst⁵, or tumor⁶⁻⁸. Surgical decompression of the affected spinal levels is indicated for the cases presenting with pronounced neurological symptoms that are confirmed by neuroimaging studies. Missed diagnosis of the thoracic lesion can result in worsening of the existing neurological deficit following lumbar decompression.⁴⁻⁸

We report on a patient with combined severe LSS and thoracic spinal tumor that were properly diagnosed in due time. There are 4 similar cases in the current medical literature that describe concurrent thoracic and lumbar compression but lumbar decompression was achieved prior to diagnosis of the thoracic lesion which resulted in postoperative neurological deterioration.

CASE DESCRIPTION

A 47-year-old obese female salesman suffered from long-lasting low back pain and bilateral leg pain. Twenty days prior to admission, she had developed progressive leg weakness predominantly on the left side. She was admitted to a regional general surgery department with complaints of stomach aches and impeded defecation. Computed tomography (CT) scan of the lumbar spine revealed severe degenerative concentric narrowing of the spinal canal resulting from ossification and hypertrophy of the yellow ligament and articular facets most severe at L4-L5 level (Fig. 1). Acute abdominal disorder was ruled out and the patient got consulted by a neurologist who found inferior paraparesis predominantly on the left side with increased deep tendon reflexes of the lower extremities. The neurological examination upon admission to the Clinic of Neurosurgery demonstrated marked lumbar vertebral syndrome, positive Valleux sign on the left, negative Lasegue sign, dermatomal L5 and S1 hypesthesia and hyperalgesia on the left, overlapped by inferior spastic paraparesis predominantly on the left side, muscle power L=2/5; R=4/5 - Modified McCormick Scale - Grade IV, increased knee and ankle jerk reflexes,

positive bilateral Babinski sign, conductive hypesthesia below T12 dermatome and preserved bowel bladder control.

Myelography revealed incomplete lower stop of the contrast agent at L4-L5 level and complete upper stop at T9-T10 level (Fig. 2). There was elevated lumbar cerebrospinal fluid (CSF) protein level of 1.63 g/l. Neurological deterioration was detected following the lumbar puncture.

Magnetic-resonance imaging (MRI) of the thoracic and lumbar segments showed right lateral intradural-extramedullary lesion at T9-T10 level that compressed and dislocated the spinal cord to the contralateral left side in combination with severe spondylotic and discogenic LSS with pronounced hypertrophy of the articular facets narrowing the central canal and neural foramina at L3-L4 and L4-L5 levels (Fig. 3 A-D).

The patient underwent two surgical procedures. The first stage included T9 and T10 laminectomies with partial right-sided arthropediculotomy. Intraoperatively, the tumor formation had a diameter of 1.5 cm with half of it calcified with broad attachment zone to the spinal dura. Total removal was achieved. The histological examination demonstrated a tumor that consisted of oval and polygonal cells with laminated spherical calcifications spread across the tumor mass. The final diagnosis was consistent with psammomatous meningioma (Fig. 4).

The second surgery was performed 10 days later. The intervention consisted of partial L4 and L5 laminectomies combined with partial facetectomy to achieve adequate neural decompression of cauda equina and adjacent segmental nerve roots.

On routine follow-up at the second postoperative year we found considerable neurological improvement to a grade II on the Modified McCormick Scale with recovered normal muscle tone of the legs. The patient was able to walk long distances free of pain. There was residual hypesthesia across the distribution zone of the left S1 nerve root, absent left ankle jerk reflex and mild weakness of the plantar flexion of the left toe due to the peripheral neural damage as a result of the severe LSS. She returned to her previous work.

The follow-up MRI at the second postoperative

Figure 1. CT – axial view and sagittal reconstruction: A. L3-L4 level; B. L4-L5 level.

Figure 2. Lumbodorsal myelography: incomplete lower stop of the contrast agent at L4-L5 level and complete upper stop at T9-T10 level.

Figure 3. MRI (A–D) - preoperative and (E–F) – postoperative: A. sagittal view; B. axial view at T9-T10; C. coronal view; D. axial view at L4-L5; E. sagittal view; F. axial view at L4-L5.

Figure 4. Histological examination of the tumor specimen (H&E stain).

year showed no tumor recurrence and adequate posterior decompression at L4-L5 level (Fig. 3E-F).

DISCUSSION

Spinal meningiomas are slow growing intradural-extramedullary lesions that often cause motor deficit (61.8%) within 6.2 months on average. The neurological symptoms depend on the tumor location in relation to the spinal cord transection.⁹ The time from disease onset to final diagnosis varies between 1 and 2 years.¹⁰

One of the most dangerous complications following spinal surgery is the neurological deterioration, especially if the motor function is involved. There are very few reports on combined lumbar pathology (disc herniation and/or stenosis) and thoracic meningioma that are diagnosed both clinically and with neuroimaging studies.^{4,6-8} In the reported cases, the diagnosis of thoracic lesion was omitted and the lumbar decompression had lead to deterioration of the neurological deficit (Table 1). We think that the accelerated neurological deterioration was caused by a dynamic alteration of CSF circulation following lumbar decompression. This is supported by the worsening of the inferior paraparesis that we observed after the lumbar puncture and CSF drainage during the myelographic examination. However, the exact pathological mechanisms of this condition remain unclear. The present case was noteworthy with the finding of a right-sided thoracic meningioma causing more severe paresis of the contralateral (left) leg. We found no report and explanation of this finding in the relevant literature. Most likely, this neurological presenta-

tion was caused by a combination of spinal cord dislocation phenomena and disturbed CSF dynamics in the affected spinal segment.

In our case, the thorough neurological examination allowed us to detect the symptoms of spinal cord compression that lead to development of inferior spastic paraparesis despite being overlapped and disguised by the symptoms caused by the severe L4-L5 lumbar spinal stenosis presenting with marked low back pain and radicular symptoms. The long medical history and course also aided this case diagnosis. The neuroimaging studies (myelography and MRI) readily demonstrated the presence of both LSS and thoracic meningioma.

CONCLUSIONS

Presence of spinal meningiomas can overlap the symptoms of lumbar disc herniation and stenosis. In all 5 reported cases in the literature, the inferior paraplegia has resulted from missed diagnosis of the thoracic lesion.

In order to avoid this disabling complication, physicians must perform a meticulous neurological examination in any case. The discrepancy between neurological symptoms and the lumbar imaging studies will necessitate MRI of upper spinal segments to rule out spinal cord compression.

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Table 1. Reported cases of inferior paraplegia following lumbar decompression surgery as a result of missed diagnosis of thoracic meningioma

Publication	Sex/ Age	Initial symptoms	Initial surgical intervention	Etiology/Affected spinal segment
M. Bozkurt et al, 2014 ⁷	M/55	LBP, right leg pain and NC	1 st decompression at L4-L5 2 nd decompression at L3-L4-L5-S1	Meningioma T2-T3
S. Knafo et al, 2013 ⁸	F/82	Right leg pain	Discectomy and partial facetectomy at L1 - L2	Meningioma T1-T2
S.B. Ko et al, 2011 ⁶	F/73 F/63	NC NC	Decompression at L4 -L5 Decompression at L3 - L5	Meningioma T3-T4 Meningioma T3-T5
A. Takeuchi et al, 2004 ⁴	F/64	NC	Decompression at L2 - L5	Meningioma T5-T6

LBP – low back pain; NC – neurogenic claudication.

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