Case Report
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Postoperative Guillain-Barré Syndrome after Surgery for Lumbar Stenosis

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Abstract

The Guillain-Barré Syndrome (GBS) is an exceptional postoperative complication with only 37 reported cases; 20 occurred after general surgery, 4 after cranial surgery and 13 after spinal surgery. The diagnosis is challenging if the syndrome occurs after spinal and particularly after lumbar surgery.

Keywords: Guillain-Barré syndrome • Surgery • Diagnosis

Introduction

We report an exceptional case of post-operative GBS, with involvement limited to the legs, occurring after operation for lumbar spinal stenosis and herniated disc and studied by post-contrast MRI.

Case Report

A 55-year-old man was observed in June 2016 because of chronic lumbar and radicular pain to the right leg, followed by "claudicatio neurogena". Magnetic Resonance Imaging (MRI) and Computerized Tomography (CT) scan of the lumbar spine revealed stenosis of the lumbar spinal canal between L3 and L5 caused by hypertrophic yellow ligaments and discal hernia at L3-L4. At neurological examination gait difficulty and crural hypoesthesia on the right leg were evident. Decompressive bilateral laminectomy between L3 and L5, resection of the hypertrophic yellow ligaments and discectomy at L3-L4 level were realized, without surgical problems. Six hours after surgery, the patient presented severe and rapidly progressive paraparesis, more marked in the distal muscles, with absent reflexes and leg and perineal hypoesthesia. Urgent CT scan and MRI showed wide decompression of the spinal canal with no hemorrhage at the surgical site. A high dose corticosteroid therapy was started [1-3].

In the following hours the paraparesis worsened. The electrodiagnostic studies of the lower legs showed decreased motor conduction, diffuse decrease of the interference pattern at L5 and S1 myotomes and spontaneous electrical activities, with particular involvement of the tibialis anterior muscles of both sides. CSF examination showed elevated protein amount with normal cells count. A post-contrast MRI performed the fourth postoperative day (Figure 1), revealed marked contrast enhancement of enlarged nerve roots of the cauda. Considering these data, diagnosis of GBS was made. The patient was promptly treated with intravenous immunoglobulins (30 gr/day for 5 days). At discharge, slight improvement of the paraparesis was evident. Six months after surgery, almost complete remission of the neurological symptoms was obtained.

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Discussion

The data of 10 cases of GBS after lumbar surgery, including ours, are summarized in Table 1 [4-9]. All were operated on for degenerative pathologies and 7 also underwent posterior fusion. A previous risk event for immune-mediated neuropathy, including sepsis-type syndrome, vaccination [6] and epidural steroid injection [1], was also referred. In 7 cases, time from surgery to the occurrence of neurological symptoms ranged from 8 to 25 days (average 12 days). In two others [1], symptoms occurred in the immediate post-operative course (3 hours), as in our patient (6 hours). Clinical manifestation always included progressive diffuse weakness, more marked on the legs, and paresthesia; ventilator support treatment was required in 4 patients. The pathophysiological theories of the postoperative GBS include intraoperative release of antigens with subsequent autoimmunization [10], in balance between elements of the immune system [11], immunosuppression during surgery with consequent subclinical infections [12]. Our case is peculiar because of the absence of previous risk factors, the very short interval time and the exclusive involvement of legs. These features have allowed suspecting a surgical complication, as epidural hematoma, direct root damage or infection. The diagnosis of postoperative GBS is very important to plane the correct therapy. The electro diagnostic studies (six among 9 reported cases) showed the findings of a sensory-motor polyradiculopathy.

CSF examination showed elevated protein levels and normal cell count

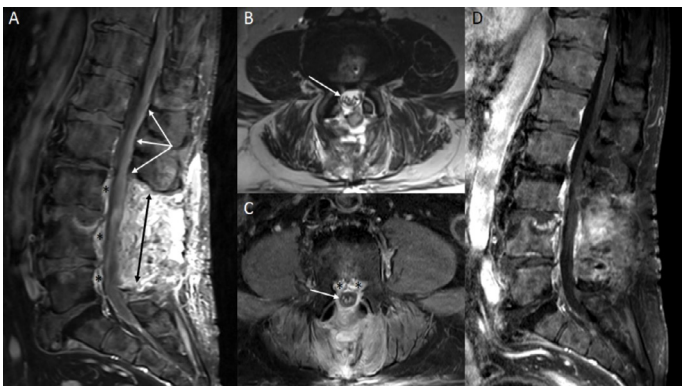

Figure 1. Post-operative (A-C) and 6 months follow-up (D) MRI. Sagittal contrast-enhanced T1-weighted sequence with fat suppression (A) shows L3-L5 decompressive laminectomy (black arrow), venous epidural congestion (asterisks) and nerve roots enhancement (white arrows). Thickening of the cauda roots is evident on axial T2-weighted image (B), while axial contrast-enhanced T1-weighted sequence with fat suppression (C) demonstrates a preferential involvement of anterior roots. (D): at 6 months follow up MRI, no pathological nerve roots enhancement is present on sagittal contrast-enhanced T1-weighted sequence.

Table 1. Summary of reported cases of Guillain-Barré syndrome after lumbar spinal surgery.

Authors/Reference	Age/Sex	Surgery	Time from surgery to symptoms	Diagnostic studies	Treatment	Follow-up (months)	Outcome
Riebel et al. [4]	62, F	T12-S1 Laminectomy and Posterior Fusion	25 days	–	IVIg, Pph , CS	6	Recovery
Son et al. [5]	50, M	T10-L2 Laminectomy, Instrumentation, Arthrodesis	8 days	EDS	IVIg	2	Minor Weakness at the Hand Muscles
Boghani et al. [1]	58, M	L4-L5 Hemilaminectomy	3 hours	EDS, CSF Examination	IVIg, Pph	12	Leg Paresthesia
	40, M	L3-L4 Hemilaminectomy	3 hours	EDS, CSF Examination	IVIg, Pph	18	Numbness on the Leg
Huang et al. [2]	69, M	Posterior Fusion T10-L5	2 days	–	IVIg	11	Tetraparesis (2/5) Ventilator Support
Chen et al. [3]	57, M	Lumbar Fusion L3-S1	9 days	EDS	IVIg, CS	16	Left Diaphragm Weakness
Rashid et al. [7]	62, F	L3-L4 Decompression and Fusion	2 weeks	EDS	IVIg	12	Able to Ambulate Independently
Sahai et al. [8]	52, M	L4-L5 Decompression and Fusion	17 days	CSF Examination	IVIg	6	Able to Ambulate Without Intervention
Dowling et al. [9]	53, F	L4-L5 Discectomy, L3-S1 Laminectomy, Posterolateral Fusion	10 days	EDS	IVIg, Anti-ganglioside Antibodies	2.5	Nearly Recovered
Present Report	55, M	Posterior L3-L5 Laminectomy and L3-L4 Discectomy	6 hours	EDS, CSF Examination Post-Contrast MRI	IVIg, CS	3	Nearly Recovered

EDS: Electrodiagnostic Studies; CSF: Cerebrospinal Fluid; IVIg: Intravenous Immunoglobulin; Pph: Plasmapheresis; CS: Corticosteroids

(albumin-cytological dissociation). However, both electro diagnostic studies and CSF examination may be normal or non-diagnostic in the early course of the disease (within 7-10 days from symptoms' occurrence) [13]. The gadolinium-enhanced MRI evidenced, in our case, nerve root enhancement. No other reported cases of postoperative GBS were studied by MRI [3]. Although MRI is not part of the routine diagnostic evaluation of GBS, the presence of root enhancement is a not specific but sensitive feature and can support the diagnosis in doubtful cases [14]. All nine reported cases were treated by intravenous immunoglobulin's (IVIg), some of them also with corticosteroids and plasma exchange (Table 1). IVIg and plasma exchange are equally effective treatments [15-17]. Corticosteroids do not show significant benefit [18]. We have used high doses of corticosteroids in the first days, then IVIg since the fourth day, when the diagnosis was clarified. The neurological outcome is variable, from complete recovery to slight/mild neurological deficits. Cases with more severe neurological impairment, those with associated respiratory distress, and those not early treated, show less favorable neurological outcome.

Conclusion

The possibility of a GBS must be considered in patients submitted to spinal surgery, who present neurological deficits in the postoperative course, in absence of other surgical complications. The enhancement of the nerve roots on the post-contrast MRI is helpful to confirm the diagnosis and to start an early and correct treatment.

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