

Acute Polyradiculoneuritis with Locked-in Syndrome in a Patient with Covid-19

Thomas Pfefferkorn (✉ thomas.pfefferkorn@klinikum-ingolstadt.de)

Klinikum Ingolstadt

Rainer Dabitz

Klinikum Ingolstadt

Thomas von Wernitz-Keibel

Klinikum Ingolstadt

Johannes Aufenanger

Klinikum Ingolstadt

Martina Nowak-Machen

Klinikum Ingolstadt

Hendrik Janssen

Klinikum Ingolstadt

Case Report

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Abstract

In this case report we present a patient from Germany who developed a severe GBS in the course of Covid-19.

Background

An Italian case series described five patients with Guillain-Barré-syndrome (GBS) associated with Covid-19 (Toscano et al. 2020). We present another case with fulminant polyradiculoneuritis leading to a locked-in syndrome with corresponding generalized nerve root contrast enhancement on MRI.

Case

A 51 year old male patient was referred to our hospital on April 2nd, 2020 with a two day history of progressive upper and lower limb weakness and akral paresthesias. He also reported fluctuating fever and flu-like symptoms with marked fatigue and dry cough over the last two weeks.

On clinical examination, substantial tetraparesis with limb muscle strength ranging from 2/5 to 4/5 (MRC grading scale) as well as generalized areflexia were documented. Vital signs were stable at that point.

A low dose chest CT scan upon admission revealed typical bilateral interstitial infiltrates in keeping with Covid-19 pneumonia. Covid-19 infection was then confirmed by a SARS-CoV-2 positive PCR testing result from a pharyngeal swab.

Cerebrospinal fluid (CSF) on admission revealed mild pleocytosis (9 cells/ μ l), normal protein content and negative PCR testing for SARS-CoV-2.

Electroneurography on the day after admission demonstrated prolonged distal motor latencies and loss of F waves suggesting peripheral demyelination.

Due to a rapidly deteriorating pulmonary gas exchange the patient needed endotracheal intubation on day two after admission. After pulmonary stabilization tracheostomy was performed on day seven after admission and weaning from the ventilator attempted.

Despite treatment with intravenous immunoglobulins (IVIG, 30g daily for 5 days starting upon admission) the neurological status deteriorated to an almost complete peripheral locked-in syndrome with tetraplegia, complete sensational loss in all extremities, bilateral facial and hypoglossal paresis as well as ongoing respiratory failure due to muscular weakness.

In light of the fulminant neurological course plasma exchange therapy (PE) was begun on day 13 after admission. Just prior to initiation of PE a second CSF sample was taken which now demonstrated marked protein elevation (10.231 mg/l; normal range up to 450 mg/l) in the absence of pleocytosis.

An MRI of the spine was performed on day 14 after admission and demonstrated massive symmetrical contrast enhancement of the spinal nerve roots at all levels of the spine including the cauda equina. Interestingly anterior and posterior nerve roots were equally affected (Figure).

At the time of manuscript submission (day 19 after admission) daily plasma exchange is still applied while the patient is demonstrating first signs of motor improvement with regressive facial and hypoglossal paresis.

Discussion

In the presented Covid-19 patient, the clinical diagnosis of acute polyradiculoneuritis, most likely resembling GBS, was confirmed by spinal MRI.

The complete sensational loss in our patient, which is considered uncommon in GBS, corresponds to the extensive posterior nerve root involvement, the ongoing neurogenic respiratory failure to the cervical root involvement. Since respiratory failure is known to be a common and hazardous problem in acute Covid-19 patients, it may be necessary to regularly consider high cervical polyradiculitis as a possible reason.

IVIg and PE are the two treatment options in moderate to severe GBS. We started with IVIg therapy right upon admission, expecting a low risk of harm with regards to Covid-19. With exacerbating neurological symptoms, a therapeutic switch to PE was considered early but initially not performed due to substantial concern to compromise the patient's immunocompetence in active Covid-19 pneumonia. PE was started only on day 13 after admission, when pulmonary gas exchange had normalized and a SARS-CoV-2 tracheal specimen was tested negative.

We conclude that GBS may be a relevant complication of Covid-19. Clinicians in general and neurologists in special should be alerted and therapies such as intravenous immunoglobulins and plasma exchange evaluated in this specific setting.

Reference

Toscano, Gianpaolo; Palmerini, Francesco; Ravaglia, Sabrina; Ruiz, Luigi; Invernizzi, Paolo; Cuzzoni, M. Giovanna et al. (2020): Guillain–Barré Syndrome Associated with SARS-CoV-2. In *N Engl J Med*. DOI: 10.1056/NEJMc2009191.

Declarations

None of the authors received external funding for this research.
Informed consent from the patient to submit the case report was obtained.

Figures

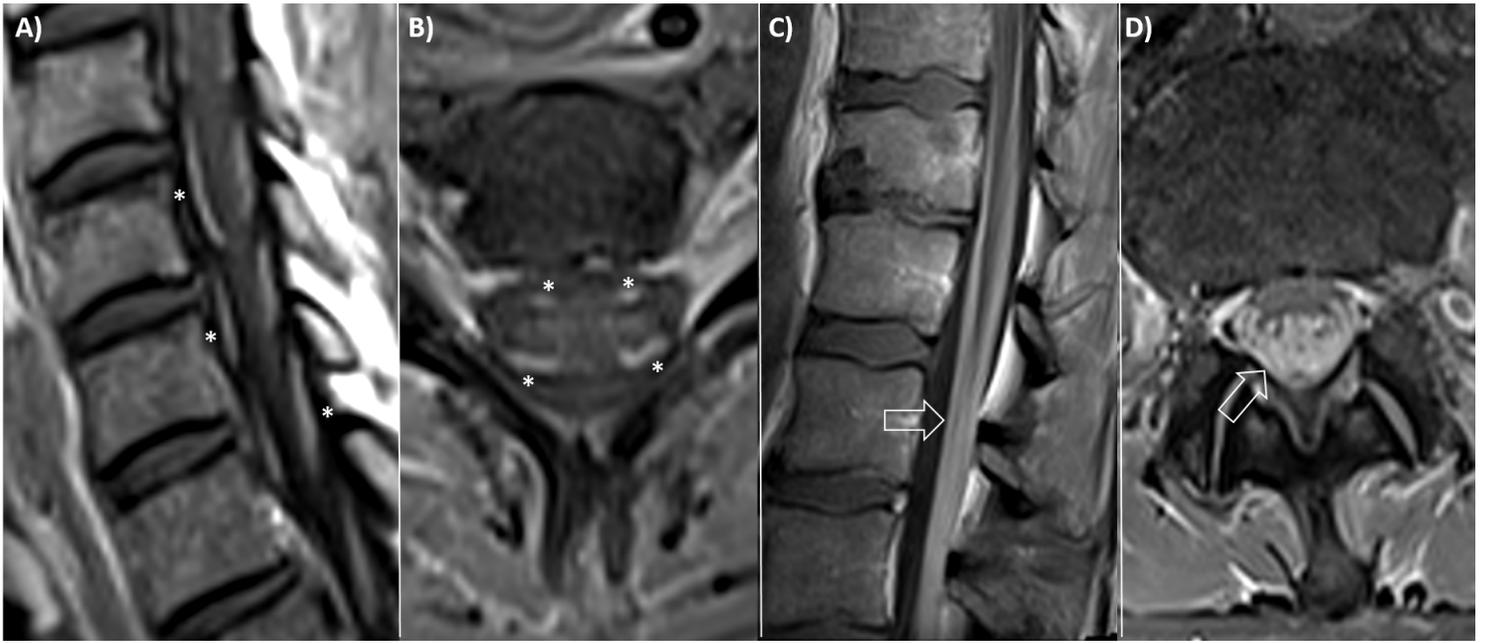


Figure 1

MRI (T1 weighted sequences after application of gadolinium) shows symmetrical enhancement of the anterior and posterior roots (white *) in the cervical spine (A,B) and the cauda equina (C,D) (white arrow)