CASE REPORT

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Longitudinally extensive transverse myelitis after epidural anaesthesia in childbirth

Longitudinalni ekstenzivni transverzalni mijelitis posle epiduralne anestezije primenjene tokom porođaja

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Abstract

Introduction. Neurological complications related to epidural anesthesia are rare, but it is necessary to recognize and diagnose them as early as possible, in order to start appropriate therapy and prevent further neurological damage. One of the rare complications of regional anesthesia described in this paper is longitudinal extensive transversal myelitis (LETM). **Case report.** A 32-year-old patient, who gave birth by Caesarean section in due term, developed LETM the very same day. Considering the neuroradiological findings that indicated to the long central lesion in the thoracic and lumbar spine, and an expected reaction to the applied immunotherapy (immunosuppressive therapy and therapeutic plasma exchange), a diagnosis of LETM was made. Even with all the therapy and regression of the lesions, the patient could not stand up without support. During the subsequent treatment, according to the instructions of the physiatrist, physical therapy was carried out, to which the patient responded slowly but favorably, with a gradual return of the function of the lower extremities. **Conclusion.** Early diagnosis and timely treatment of LETM are crucial for the prognosis of the disease and the early recovery of the patient.

Key words:
anesthesia, epidural; diagnosis; drug-related side effects and adverse reactions; delivery, obstetric; myelitis, transverse; paralysis.

Apstrakt

Uvod. Neurološke komplikacije vezane za epiduralnu anesteziju su retke, ali je neophodno što ranije ih prepoznati i dijagnostikovati, u cilju započinjanja odgovarajuće terapije i sprečavanja daljih neuroloških oštećenja. Jedna od retkih komplikacija regionalne anestezije opisane u ovom radu je longitudinalni ekstenzivni transverzalni mijelitis (LETM). **Prikaz bolesnika.** Bolesnica stara 32 godine, porođena carskim rezom u terminu, istog dana razvila je LETM. Imajući u vidu neuroradiološke nalaze koji su ukazivali na dugu centralnu leziju u torakalnom i lumbalnom delu kičme, i očekivanu reakciju na primenjenu imunoterapiju (imunosupresivna terapija i terapijska izmena plazme), postavljena je dijagnoza LETM. I pored primenjene terapije i regresije lezija, bolesnica nije mogla da ustane bez podrške. U toku kasnijeg lečenja, po instrukcijama fizijatra sprovedena je fizikalna terapija, na koju je bolesnica sporo ali povoljno reagovala, postepenim povratkom funkcije donjih ekstremiteta. **Zaključak.** Rana dijagnostika i blagovremeno lečenje LETM ključni su za prognozu bolesti i rani oporavak bolesnika.

Ključne reči:
anestezija, epiduralna; dijagnoza; lekovi, neželjeni efekti i neželjene reakcije; porođaj; mijelitis, transverzalni; paraliza.

Introduction

Neurological complications following obstetric central neural blocks rarely happen. Even though central neural blockade can cause neurological complications, it is essential to understand that neurological deficits may develop spontaneously (e.g., epidural abscess/hematoma) or as a result of the course of labor (maternal obstetric palsies) [1].

Serious, life-changing neurological complications caused by central neural blocks are rare. Immediate recognition and appropriate management are of crucial importance in reducing the risk of permanent neurological impairment [2].

We present a patient with longitudinal extensive transverse myelitis (LETM) several hours after giving birth by Caesarean section (C-section) performed under epidural anesthesia.

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Case report

A pregnant 32-year-old woman came to the gynecological clinic for delivery in the expected term. Contractions were irregular; however, prelabour rupture of the membranes occurred. Two years earlier, this patient gave birth by C-section, performed without complications. Medical history data indicated that the patient was healthy and pregnancy was under control; yet, during the fourth month of pregnancy, the patient was infected by COVID-19, characterized by a moderate clinical picture. Immunization against SARS-CoV-2 was not performed.

The premature rupture of the membranes, irregular uterine contractions, unfavorable obstetric findings, and the fact that previous childbirth ended with a C-section two years earlier were all indications for this delivery to be performed surgically, i.e., by C-section. After the usual preoperative preparation, a C-section was performed with epidural anaesthesia. Since the previous C-section was performed under epidural anesthesia, the decision was made to perform this one under the same anesthesia. An epidural catheter was placed in the operating room. The patient was placed in a sitting position. In sterile conditions, an 18G needle was placed in the L4/L5 space. The epidural space was identified using the saline loss of resistance technique (loss of resistance to saline – LORS). The epidural catheter was placed through the needle at a depth of 5 cm. Then the needle was taken out, and the catheter was connected to the connector and fixed at the insertion site.

After that, a 20 mL dose of 0.5% bupivacaine + fentanyl 100 μg was given, 5 mL each in frames of 5 min between doses. The patient felt pain in the lumbar region during the placement of the epidural catheter. The operative course was normal and complication-free. No anesthesiological complications were noted during the surgery. A healthy male child was delivered by C-section, weighing 3,400 g, 52 cm long, with an Apgar score of 9/10.

The same afternoon, the patient told the doctor that she did not feel well. The patient could not feel her legs nor move them. She was unable to get out of bed. The patient was examined by an anesthesiologist and internist. Laboratory blood tests were performed. All performed laboratory analyses were within physiological limits, including all inflammatory parameters and coagulation analyses. As the discomfort persisted, the patient was referred to a neurologist. The neurologist concluded that it was a case of *paraplegia flaccida*.

A lumbosacral spine computed tomography scan was indicated, followed by a magnetic resonance imaging (MRI) scan, which verified the existence of an inflammatory process of the spinal cord in the T8–T12 levels that correspond to transversal LETM accompanied by edema. Treatment was continued at a neurological clinic. The patient was examined by an internist and cardiologist; all findings were normal. Persistent weakness in the lower extremities with severe flaccid paraparesis was verified by a neurological exam together with bilaterally extinguished reflexes and hyperesthesia below knee level. Deep sensitivity was preserved, while vibration sensitivity was reduced to knee level. Muscle size, tone, mobility, and reflexes of the upper extremities were normal. Cerebellar test results were also normal. Examination of the spinal fluid obtained by lumbar punction was performed. Bacterial and viral tests in the spinal fluid were negative. Cytochemical analysis of the spinal fluid confirmed the presence of 5 lymphocytes, proteinorachia 0.52, and glycorachia 4.5 at a glycemic ratio of 6.2. All immunology and virology blood tests were negative, thus excluding the existence of autoimmune diseases [ANA (antinuclear antibody) and VDRL (venereal disease research laboratory) were negative] and viral infections [human immunodeficiency virus (HIV), herpes simplex virus (HSV), and hepatitis C virus (HCV)]. MRI examination of the endocranium confirmed normal findings. Cervical spine MRI examination showed a corrected physiological lordosis of the cervical spine, moderate symptoms of spondylosis, protrusion of C4–C5 disc, osteophyte complex with compromised root C5 right and light reduction of anterior cerebrospinal fluid spaces, with relative spinal stenosis but without any signs of myelopathy. MRI exam of the thoracic spine and thoracolumbar junction confirmed a longitudinal lesion of the spinal cord extending from the upper plate T9 distally to the T12–L1 level, easily expanding the myelin. In differential diagnostics, such findings could have corresponded to transverse myelitis, sequelae of acute disseminated encephalomyelitis, or even spinal meningitis. Bearing in mind that an MRI exam was also performed immediately after delivery, i.e., several days earlier, the results were compared, and it was noted that a partial regression of the described lesion had occurred. During the entire hospitalization, the patient was stable and afebrile. She was treated with pulse corticosteroid therapy (methylprednisolone), initially 1 g/day for five days, then with 2 g/day for another five days, followed by therapeutic plasma exchange (seven treatments in total), accompanied by physical therapy. This therapy led to improvement of the neurological condition of the patient (improved strength of the proximal leg muscles). However, even with all the therapy and regression of the lesions, the patient could not stand up without support (crutches) and could only make a few steps. For that reason, immediately after being discharged from the neurology clinic, the patient was sent to intensive physical therapy under the constant supervision of a physiatrist. During the subsequent treatment, according to the instructions of the physiatrist, physical therapy was carried out, to which the patient responded slowly but favorably, gradually regaining the function of the lower extremities.

Discussion

LETM is a neurological condition characterized by a contiguous inflammatory lesion of the spinal cord [3]. It is usually related to autoimmune disease of the central nervous system, rarely to multiple sclerosis.

The clinical course of LETM is characterized by single or multiple attacks of paraparesis or tetraparesis, sensory deficits, and bowel/bladder disturbances, and can lead to respiratory failure in severe cases [4]. The early distinction between

possible LETM etiologies is crucial in providing an accurate prognosis and guiding therapeutic strategy.

This case report presents a patient who had given birth by C-section in epidural anaesthesia and developed paraparesis the same day after delivery. During hospitalization, the vascular, inflammatory, infectious, neoplastic, and paraneoplastic nature of the disorder was analyzed. Considering the neuroradiological findings that indicated to the long central lesion in the thoracic and lumbar spine, with an expected response to the applied immunotherapy (immunosuppressive therapy and therapeutic plasma exchange), it was concluded that this was a case of LETM of incompletely clarified etiology, most likely of immunological reasons.

References cite sporadic cases of LETM, usually related to autoimmune diseases. For instance, a study by Chen et al. [5] from 2004 described seven cases of LETM accompanied by systemic lupus erythematosus; nevertheless, not many cases in which LETM clinical picture appeared immediately after delivery in epidural anesthesia have been described so far [6].

Furthermore, no available data in the literature could confirm whether or not COVID-19 infection in pregnancy could cause some unrecognized immune disorders.

Conclusion

For the recovery from LETM, early diagnostics and the introduction of adequate therapy are crucial in order to alleviate or prevent further neurological consequences and quickly reestablish normal quality of life. Even though LETM is a rare neurological complication of epidural anaesthesia in childbirth, it should be taken into account and diagnosed promptly so that the patient can recover as soon as possible and dedicate all of her strength to her child.

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