

Unilateral Sixth Cranial Nerve Palsy Following C/S as a Complication of Spinal Anaesthesia

C/S Sonrası Spinal Anesteziye Bağlı Gelişen Altıncı Kraniyal Sinir Paralizisi

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Cranial nerve palsy (CNP) is a rare complication following lumbar puncture, which is a common procedure used most often for diagnostic and anaesthetic purposes. The sixth cranial (abducens) nerve is the most commonly affected cranial nerve. We report a case of unilateral sixth nerve palsy after spinal anaesthesia that improved immediately after an epidural blood patch (EBP). Kraniyal sinir paralizisi (KSP), genellikle diyagnostik ve anestezi sağlamak amacıyla kullanılan lomber ponksiyonun nadir görülen bir komplikasyonudur. Altıncı kraniyal sinir (abducens) en sık etkilenen kraniyal sinirdir. Bu olgu sunumunda, dura ponksiyonu sonrası gelişen, epidural kan yaması (EKY) ile hızlı bir şekilde düzelme gösteren, tek taraflı altıncı kraniyal sinir paralizili hastamızı sunmayı amaçladık.

Key Words: Abducens nerve palsy, dural puncture, spinal anesthesia

Anahtar Kelimeler: Abdusens sinir paralizisi, dural ponksiyon, spinal anestezi

Introduction

umbar puncture (LP) is widely used for diagnostic purposes and for the application of anaesthesia. Although rare, cranial nerve palsy (CNP) can be seen as a complication of this procedure. The most commonly affected cranial nerve is the sixth (abducens) nerve. In this case report, a case of unilateral sixth cranial nerve palsy, which developed after spinal anaesthesia, that recovered quickly after an epidural blood patch (EBP) is described.

Case Presentation

A 29-year-old $G_2P_0A_0$ woman, who was 38 weeks and 3 days pregnant, was admitted to our hospital with a complaint of on-going contractions. An emergency caesarean section (C/S) under spinal anaesthesia was agreed upon for the patient, with fetal distress that was detected according to non-stress test results. The pregnant woman, who had no history of disease, was regarded as ASA IE. The patient had a normal pregnancy period, with no complications, and took only vitamins during the pregnancy. The patient's vital signs were as follows: blood pressure (BP) of 107/66 mmHg, heart rate (HR) of 91 beats per minute, respiratory rate (RR) 20 breaths per minute, body temperature 36.8°C, and oxygen saturation via pulse oximetry (SpO₂) 100% at room condition, and Glasgow coma scale (GCS) score was 15. Laboratory results showed a normal coagulation profile. Thrombocyte count was 194.000 microL, creatinine was 0.6 mg dL⁻¹, blood urea nitrogen (BUN) was 6 mg dL⁻¹, fasting glucose level was 80 mg dL⁻¹, and haemoglobin (Hg) level was 9.7 mg dL⁻¹. Furthermore, the patient did not have dehydration or an electrolyte imbalance. Prior to the operation, the patient was informed about the advantages and the risks of spinal anaesthesia, and an informed consent form was obtained.

After sufficient skin disinfection, spinal anaesthesia was administered with a single attempt in the lateral decubitus position through the L_2 - L_3 intervertebral space by using a 22-gauge Quincke spinal needle, without any complication. The flow of cerebrospinal fluid was blood-free and clear. Analgesia was discontinued on the postoperative fourth hour. After this period, the patient's analgesia was continued with the oral administration of paracetamol (8-hour intervals) and intravenous administration of a non-steroidal anti-inflammatory drug (metamizole sodium). The patient's general condition (neurological condition, vital stats, and hemodynamic parameters) was stable during the preoperative and postoperative periods. Throughout the operation, the patient was administered 1500 mL of 0.9% NaCl solution intravenously.

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©Telif Hakkı 2014 Türk Anesteziyoloji ve Reanimasyon Derneği - Makale metnine www.jtaics.org web sayfasından ulaşılabilir. ©Copyright 2014 by Turkish Anaesthesiology and Intensive Care Society - Available online at www.jtaics.org During breast feeding, the patient complained of severe neck pain, which was not responsive to standard analgesics or hydration (daily liquid intake was 2000 mL) 8 hours after the operation during post-operative day 1. Sixteen hours after the operation, she began to complain about pain in her head, neck, shoulder, and eyeballs.

The patient had nausea that did not responded to antiemetics but decreased by lying down during post-operative day 2.

During the third post-operative day, the complaint of nausea was completely relieved; however, the patient had complaints of neck stiffness and double vision, and during the physical examination, strabismus was detected in the right eye. Ophthalmology and neurology consultations were requested for the patient. The ophthalmological examination showed that the patient had limited outward vision in her right eye, and the patient emphasized that her double-vision increased when looking outwards and to the distance. The patient was diagnosed with unilateral sixth cranial nerve palsy and given intermittent eye closing and orthoptic (turning outward) exercises. The patient had a lacunar cerebral infarct on the cranial computerized tomography (CT) (Figure 1), while the magnetic resonance imaging (MRI) of the patient was normal (Figure 2).

During post-operative day 4, EBP was applied to the patient. In the lateral decubitus position, 15 mL of autologous blood was drawn from the patient and was injected to the patient through the epidural space at L_3-L_4 . The patient was laid down for 1 hour in the supine position and fully recovered from the neck and shoulder pain without any medication within 2 hours following the procedure. During the weekly follow-ups after the EBP, the complaint of double vision was completely eliminated on post-operative day 11, and the strabismus completely recovered after 4 weeks.

Discussion

Sixth cranial nerve palsy should be taken into consideration in all patients with optic symptoms, such as blurred or double vision (1). Abducens nerve palsy is a complication that rarely develops after spinal anaesthesia. The incidence of this complication was reported to be between 1:300 and 1:8000 (2). The risk of abducens nerve palsy after spinal anaesthesia is indefinite. Thomke et al. reported the risk as 1:5800, and Follen et al. reported the incidence as 1:400 in their studies (3, 4). Abducens palsy incidence was reported to be 1:500 after myelography (5).

Abducens palsy can be unilateral or bilateral after LP (6). According to common belief, abducens nerve palsy is associated with the distension or withdrawal of the sixth nerve, which is caused by a change in local ischemia or nerve position. The sixth cranial nerve is the most commonly affected nerve due to its long intracranial course (7). Unilateral or bilateral abducens nerve palsy, which emerges 4-14 days after lumbar puncture procedures and improves completely between 4 weeks to 4 months, has previously been reported (3, 6, 8).



Figure 1. Image of the patient's lacunar infarct



Figure 2. Normal magnetic resonance imaging of the patient, head side

Magnetic resonance imaging (MRI) has demonstrated that this results in intracranial hypotension with descent of the brain, even in the supine position, causing traction of the sixth nerve and pain-sensitive structures (9).

The distension of the nerve causes local ischemia and dysfunction. This can be accompanied by several symptoms, such as vertigo, nausea, and vomiting (10).

Neoplasms, infiltrative and inflammatory lesions, infections, and vascular diseases should also be taken into consideration in the differential diagnosis of sixth cranial nerve palsy (11). The patient did not present with any of those diseases, and evaluations by a neurologist and an ophthalmologist as well as a cranial CT confirmed post-dural puncture CNP as the most likely diagnosis.

Large-scale studies have shown that LP-dependent postdural puncture headache (PDPH) and other central nervous system-related side effects are associated with age, gender, and the diameter and shape of the spinal needle. Identical large-scaled spinal needles cause PDPH more frequently than small-scaled spinal needles (6, 8, 12). Multiple spinal injections through the subarachnoid space may also result in PDPH and abducens palsy (5). In addition, young age and female gender are common risk factors (12).

The largest complication of cases of diplopia after spinal anaesthesia showed that the development of CNP was rare prior to the fourth day after dural puncture, and the mean presentation time was 10 days. Within 1 week after the diagnosis, 2/3 of the patients fully recover, while 25% of the patients may remain symptomatic for over a month (13). In 10% of the cases, cranial nerve palsy may last more than 3 months (14). According to previous reports, the EBP has not been able to fix cranial nerve function but improves headache completely in patients whose onset of symptoms is more than 24 hours (15). However, the EBP produces better results within 24 hours following the onset of the CNP symptoms (16). It is hypothesized that early EBP minimizes the duration of downward displacement and stretching of the abducens nerve, thus making it less likely to be prone to persistent palsy (17). In the current case, the EBP was applied within the first 24 hours of the onset of the CNP symptoms.

Conclusion

The current study presented a case of unilateral sixth nerve palsy that improved immediately after an EBP, completed within 24 hours of the onset of cranial nerve palsy symptoms. Blood patching may be a reasonable treatment for ocular nerve palsy, as it relieves PDPH and improves diplopia. Atraumatic needles with side holes, such as Sprott or Whitacre needles or smaller-dimension Quincke needles, may be a better choice for spinal anaesthesia, as they decrease the incidence of PDPH.

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