Diplopia: A Rare Orthopedic Clinical Complaint After Knee Arthroscopy

Diz Artroskopisi Sonrası Ortopedi Polikliniğine Nadir Bir Başvuru Şikâyeti: Diplopi

After Knee Arthroscopy: Diplopia

Eyüp Cağatay Zengin[1], Ebru Kelsaka[2], Alper Cıraklı[1], Murat Erdogan[1], Incı Gungor[3]
[1] Departments of Orthopedics and Traumatology, [2] Departments of Anesthesiology, [3] Departments of Ophthalmology, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Turkey

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Özet

Otuz iki yaşında erkek hasta, on gün önce artroskopik diz cerrahisi için spinal anestezi aldıktan sonra başlayan, sol gözde diplopi (çift görme) şikâyeti ile polikliniğimize başvurdu. Hastanın konservatif takip sonrası ikinci haftada şikâyetlerinin azaldığı, birinci ay sonunda tamamen geçtiği gözlendi. Bu olgu sunumunda; spinal anestezi altında yapılan artroskopik diz cerrahisi sonrası, ortopedik cerrahların sık olarak karşılaşmadıkları diplopi şikayetiyle polikliniğimize başvuran olguyu tartışmayı amaçladık.

Anahtar Kelimeler

Diplopi; Abdusens Sinir Hasarı; Spinal Anestezi; Artroskopi; Komplikasyon

Abstract

The patient was a 32-year-old male who had undergone arthroscopic surgery under spinal anesthesia ten days prior to being admitted to hospital with a complaint of diplopia (double vision). The patient was examined and it was determined that the diplopia was due to sixth cranial nerve palsy. After conservative treatment, his complaints decreased after two weeks and completely resolved in one month. We present the case of diplopia due to spinal anesthesia after arthroscopic surgery, which is not a typical case seen by orthopaedic surgeons.

Keywords

Diplopia; Abducens Nerve Injury; Spinal Anesthesia; Arthroscopies; Complications

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Corresponding Author: E. Çagatay Zengin, Department of Orthopedics and Traumatology, Faculty of Medicine, Ondokuz Mayıs University, 55139, Kurupelit, Samsun, Turkey. T.: +90 3623121919-2361 F.: +90 3624576041 E-Mail: zengincagatay@hotmail.com

Introduction

The most common complication after spinal anesthesia is headache and, more rarely, hearing loss, diplopia, tinnitus or complications, such as loss of consciousness, have been reported [1]. As a result of intracranial hypotension due to loss of cerebrospinal fluid (CSF), all intracranial nerves can be affected, except for intracranial nerves one, nine and ten. Due to the positioning of the nerves, the sixth intracranial nerve (N. abducens) is affected in 95% of the cases [2]. Diplopia occurs as a result of extraocular muscle paralysis with or without headache. It may be single-sided or double-sided.

In this case report, we have presented the case of diplopia seen 10 days after arthroscopic knee surgery in which the patient was administered spinal anesthesia.

Case Report

A 32-year-old male patient was admitted to hospital with complaints of diplopia (double vision). He had undergone arthroscopic left knee surgery under spinal anesthesia ten days prior to the admission for diplopia and he was discharged from the hospital the following day. Upon discharge, the patient was given information about how to prevent post-dural-puncture headache and he was warned to take fluids and get bed rest; however, despite these warnings, the patient stated that he did follow that advice or take the suggested measures. Two days after he was administered the spinal anesthesia, he experienced a headache that began in the back of his neck and changed position. Four days after undergoing spinal anesthesia, the patient began complaining about double vision. The patient had no additional disease and no history of drug use. He was consulted to the anesthesia department and hospitalised. The diagnosis was considered as sixth cranial nerve palsy due to the intracranial hypotension caused by cerebrospinal fluid loss during the spinal anesthesia. The patient's hematologic and biochemical values had been checked preoperatively and were interpreted as normal. Intraoperative and postoperative hemodynamic data from the anesthesia records were also interpreted as normal. The spinal anesthesia had been administered in a lateral position and the anesthesia had been placed into the intervertebral space to the left of the 3-4 lumbar vertebrae using a 25-gauge (G) pencil tipped needle by injecting 12.5 mg hyperbaric bupivacaine (Marcaine spinal injection of 0.5% heavy bulb, Astra Zeneca). The operation began 10 minutes after administration of the spinal anesthesia so that the patient's lower extremities were lateralised.

In the hospital, the patient's continuing headache severity was evaluated by a visual analogue score ranging from 1-2. Fluid replacement therapy was started with paracetamol + caffeine-containing analgesics and bed rest was recommended. Ophthalmology and neurology consultations were requested. During a right binocular diplopia examination, the ophthalmologist used the Maddox test and diagnosed diplopia due to the presence of right-sided sixth cranial nerve palsy. The patient's neurological examination was normal. Cranial MRI and diffusion MRI showed no pathological findings and visual field testing was normal. The patient noted that his diplopia had decreased during the treatment and, after four days, he was discharged upon his own request. The diplopia decreased during the second week and complete remission was seen one month later, during the patient's follow-up visit.

Discussion

Diplopia or extraocular muscle paralysis that occurs after dural initiatives often leads patients to visit the neurology and ophthalmology outpatient clinics. For diplopia, the rate of occurrence ranges between 1/400-1/8000 [3]. Diplopia occurs after spinal anesthesia in 47% of patients; it occurs after myelography in 18% of patients and it occurs after a lumbar puncture for diagnostic procedures in 18% of patients. The abducens nerve (sixth cranial nerve) is the cranial nerve that is most often affected and it is responsible for diplopia in 92% to 95% of all cases. Patients between the ages of 17-69 are typically affected, but this condition often occurs in patients who are older than 30 years of age. Abducens nerve palsy is more frequent in men according to Thorsen et al. [4], whereas other clinical reports note that it occurs equally among males and females [2]. Nerve abducens palsy is unilateral in 80% of cases [4]. Oculomotor (third cranial nerve) and trochlear (fourth cranial nerve) nerve involvement, although rare, can be added to the list of nerves that can be affected. It can be difficult to diagnose this condition in patients with more than one cranial nerve involvement [5].

Sixth cranial nerve palsy arises after or with a post-dural-puncture headache. Diplopia can occur after spinal anesthesia due to the loss of cerebrospinal fluid (CSF) leading to intracranial hypotension, which results in the displacement of cerebral structures. Due to the long intracranial course and the positioning of the nerve, the nerve becomes susceptible to mechanic damages. Prevention of CSF leakage is the most important way to reduce intracranial hypotension. Therefore, for spinal anesthesia, the use of thin gauge and blunt-tipped needles is recommended [6]. In our patient, we used a pencil tipped 25 G needle and it was a risk factor.

Diplopia can be observed one day to three weeks after spinal anesthesia. The onset of diplopia can often be seen between 4-10 days post-surgery in what is known as the 'window period' [4]. During this 'window period', patients often visit the neurologist or ophthalmologist instead of the orthopedic surgeon. Orthopedic surgeons are not aware of this complication because of its rare occurrence. The patient in this case study was the first patient at our clinic to complain about diplopia.

In the differential diagnosis of diplopia, malignancy, ischemia, trauma, aneurysm, multiple sclerosis, encephalitis and other causes must be ruled out [1]. Magnetic resonance imaging (MRI) is important in the differential diagnosis. Using magnetic resonance imaging, changes in pachymeningeal tissue, dural thickening and displacement of brain parenchyma due to the intracranial hypotension can be distinguished from other possible etiologic factors.

If there is isolated cranial nerve involvement and a history of prior headache and the diplopia begins three weeks after having undergone spinal anesthesia and no other neurological involvement is found, the developed diplopia can probably be interpreted as a complication of spinal anesthesia.

Post-dural-puncture headache treatment has both conservative and invasive treatment protocols. Conservative treatment

consists of bed rest, hydration, analgesics and the ingestion of caffeinated drinks [1]. The effect of bed rest after spinal anesthesia has not been proven to prevent the development of diplopia. Kose et al. [7] have reported the development of diplopia due to spinal anesthesia in a 38-year-old patient with hallux valgus. They decided that the use of conservative treatment is sufficient. Invasive therapy, such as an epidural blood patch, can be applied. The use of an epidural blood patch in the treatment of headache after spinal anesthesia has a 93% success rate, but this approach does not show the same success rate in the treatment of diplopia [8]. Post-dural-puncture headache or diplopia may occur in patients receiving an epidural blood patch. In such a case, an epidural blood patch may be responsible for the development of diplopia. On the other hand, in undiagnosed subdural hematoma after spinal anesthesia in patients with neurological symptoms, the use of an epidural blood patch can lead to increased incidences of symptoms [7].

Before using an epidural blood patch, a complete medical history should be taken. The patients should be clinically evaluated in terms of subdural hematoma. Due to the decrease in the severity of symptoms in our patient, conservative treatment was continued.

Abducens nerve palsy after spinal anesthesia often has a good prognosis and it often resolves completely at any point between four weeks and four months. If isolated abducens nerve palsy occurs in patients without evidence of other neurological symptoms, the progression of the condition should be monitored and diplopia should be treated conservatively.

The lateralisation in the left side position for 10 minutes can lead to the development of right-sided sixth cranial nerve palsy because the force of gravity leads to increased traction on the right side of the sixth cranial nerve. In the literature, we did not see the effect of lateralisation on the cranial nerve. However, the implementation of left lateralisation suggests that this mechanism may explain right-sided sixth cranial paralysis.

Conclusion

Outpatient arthroscopic knee surgery patients who were discharged should be advised to undergo bed rest and increase their fluid intake. In addition to headaches, diplopia can also be seen as a complication and information about preventing or reducing symptoms should be given to patients. When patients who have undergone postoperative orthopedic surgery with spinal anesthesia visit the clinic, complaining of diplopia, they should be asked about their medical history. It is important for the surgeon and the patients to know that diplopia caused by spinal anesthesia is reversible. This situation should not be a surprise to orthopedic surgeons.

Competing interests

The authors declare that they have no competing interests.

References

1. Güngör I, Gunaydın B, Taş A, Dayanır H, Altınsoy A: Postspinal tinnitus requiring treatment:efficacy of epidural blood patch: case report. Turkiye Klinikleri J Med Sci 2012; 32:515-519.
2. Hayman, IR., Wood, PM: Abducens nerve paralysis following spinal anesthesia. Ann Surg 1942; 115:864-868.
3. Thomke F, Mika-Gruttner A, Visbeck A, Bruhl, K: The risk of abducens palsy after diagnostic lumbar puncture. Neurology 2000; 54:768-769.
4. Thorsen, G: Neurological complications after spinal anesthesia. Acta Chir Scand 1947; 95:270-272.
5. King, RA, Calhoun JH: Fourth cranial nerve palsy following spinal anesthesia: A case report. J Clin Neuroophthalmol 1987; 7:20-22.
6. Vial F, Bouaziz H, Adam A, Buisset L, Laxenaire MC, Battaglia A: Oculomotor paralysis and spinal anesthesia. Ann Fr Anesth Reanim 2001; 20:32-35.
7. Kose KC, Cebesoy O, Karadeniz E, Bilgin S: Eye problem following foot surgery-Abducens palsy as a complication. MedGenMed 2005; 7:15-17.
8. Safa-Tisseront V, Thormann F, Malassine P, Henry M, Riou B, Coriat P, Seebacher, J: Effectiveness of epidural blood patch in the management of postdural puncture headache. Anesthesiology 2001; 95:334-339.

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