Turk J Anaesthesiol Reanim 2017; 45: 231-3 DOI: 10.5152/TJAR.2017.95881

Case Report

Complication of Peribulbar Block: Brainstem Anaesthesia

Leyla Kazancıoğlu[1], Şule Batçık[1], Hızır Kazdal[1], Ahmet Şen[1], Berrak Şekeryapan Gediz[2], Başar Erdivanlı[1]
[1]*Department of Anaesthesiology and Reanimation, Recep Tayyip Erdoğan University School of Medicine, Rize, Turkey*
[2]*Department of Eye Diseases, Recep Tayyip Erdoğan University School of Medicine, Rize, Turkey*

Cite this article as: Kazancıoğlu L, Batçık Ş, Kazdal H, Şen A, Şekeryapan Gediz B, Erdivanlı B. Complication of Peribulbar Block: Brainstem Anaesthesia. Turk J Anaesthesiol Reanim 2017; 45: 231-233

Abstract

Peribulbar block is used to obtain anaesthesia and akinesia of the eye by injecting a local anaesthetic around the musclecone. A patient scheduled for cataract surgery received peribulbar block with 6 mL of 2% lidocaine hydrochloride. Following the injection, confusion, hypotension and dilatation of the contralateral pupil rapidly progressed to loss of consciousness and respiratory arrest. The patient was intubated and mechanically ventilated for 30 min. The patient regained her consciousness, was extubated and transferred to the intensive care unit for further follow-up. Although brainstem anaesthesia because of peribulbar block is very rare, this procedure should be performed with complete monitorisation and resuscitation equipment.

Keywords: Peribulbar anaesthesia, brainstem anaesthesia, respiratory arrest, patient monitarisation

Introduction

Peribulbar block is one of the regional anesthesia technique that used for providing anaesthesia and akinesia in ophthalmic surgery. With a local anaesthetic agent administered into the extraconal compartment of the eye, risk of optic nerve damage is avoided. Therefore, more anaesthetic agent is needed. Peribulbar block is frequently preferred for its low rate of complications before ophthalmic surgery despite its disadvantages such as requiring more than one injection and a larger volume of local anaesthetic agent (1). The rate of major complications under peribulbar anaesthesia was reported to be 0.006% in patients undergoing ophthalmic surgery (2). Although peribulbar block is theoretically considered to be much safer and easier to apply, some cases of brainstem anaesthesia after peribulbar block have been reported in the literature (3, 4). In our study, a case with respiratory depression caused by probable brainstem anaesthesia due to peribulbar block that was administered prior to cataract surgery is presented.

Case Presentation

Written informed consent for this study was received from the 68-year-old female patient who was planned to undergo elective cataract surgery for her right eye. She had essential hypertension for approximately 15 years, and she used indapamide and triamterene for its treatment. The laboratory findings of the patient, who did not have any systemic disease except hypertension, were normal. She had a preoperative risk score of ASA II (American Society of Anaesthesiologists). She was operated on for a cataract in her left eye under peribulbar block one year ago and was discharged without any problems. The patient was monitored (heart rate, electrocardiography, non-invasive blood pressure and oxygen saturation), and a vascular access was established. For anaesthesia prior to the cataract surgery, an ophthalmologist performed peribulbar block by injecting 6 mL of 2% lidocaine hydrochloride (Jetokain Ampul; Adeka İlaç San., Samsun, Turkey) into the middle of the lateral limbus and lateral canthus at the inferotemporal lower orbital rim of the lower eyelid with a 25-gauge 25 mm needle.

Immediately before the injection of anaesthetic agent, the plunger of the syringe was withdrawn to avoid intravascular injection, and no cerebrospinal fluid or blood was observed. There was no resistance to the injection, and manual compression was gently applied for 5 minutes. Approximately 7–8 minutes after the injection, the patient was taken

Address for Correspondence: Ahmet Şen E-mail: ahmetsenau@gmail.com

Received : 07.02.2017
Accepted : 24.04.2017

into the operating room and covered with sterile cloths. While preparing for the operation, a decrease was noticed in peripheral oxygen saturation, and the operation was ended before it began. A cyanosis was observed in the face of the patient. Cardiac massage and 1 mg adrenalin were applied to the patient, who was unconscious and whose pulse could not be felt. She was intubated, and positive pressure ventilation was performed. Her saturation values rapidly increased, her pulse and tension were felt, and she began to regain consciousness. After she completely recovered in 30 minutes and could obey instructions, she was extubated. She was then transferred to the intensive care unit for close monitoring. Blood pressure and artery blood gas were followed with intra-arterial invasive monitoring. Haemogram and biochemistry analyses were found to be normal in the laboratory. Cardiac pathology was not considered because her cardiac enzymes were normal in the cardiology consultation. A day later, the patient was discharged as conscious, oriented and cooperative.

Discussion

Brainstem anaesthesia occurs when an injected anaesthetic agent directly enters into the subarachnoid space or a local anaesthetic agent spreads into the central nervous system (5). Some mechanisms are suggested for this condition, which sometimes develops after retrobulbar block and can be fatal. The cerebral dura mater provides a tubular sheath for the optic nerve as it passes through the optic foramen. This sheath fuses with the epineurium of the optic nerve and continues with the sclera, and it then passes to the subdural space in the brain and provides a conduit for local anaesthetic agents. If the optic nerve sheath is perforated with the needle tip, central spread can occur (6). In another mechanism, the optic nerve sheath is penetrated accidentally, and local anaesthetic solution is injected into the subdural or subarachnoid space. It travels through the ipsilateral optic nerve, optic chiasm and contralateral optic nerve and finally ends in the upper brainstem. Furthermore, intra-arterial injection of local anaesthetic agent can lead to seizures and brainstem anaesthesia (7). Respiratory depression and brainstem anaesthesia can develop as complications of peribulbar block, but the risk for the development of serious complications is generally low (7).

The clinical picture can present with mild convulsion, aphasia, apparent shivering, convulsing behaviours, bilateral brainstem nerve palsies, hemiplegia, paraplegia, or irregularities in respiratory pattern (8).

After peribulbar block, compression can be performed by applying a gentle manual massage, as in our case, or intraocular pressure can be reduced with the help of a balloon (9, 10). In this way, the efficiency of anaesthetic agent is increased by spreading it, and bleeding due to the injection is prevented.

Most of these cases have been reported for retrobulbar anaesthesia, and brainstem anaesthesia following peribulbar block has been reported to develop only in a few cases (3, 4). In our case, the operation was stopped due to decreased peripheral oxygen saturation that was first noticed in the monitor because the patient's face was covered with a sterile cloth. Upon noticing the decrease in peripheral oxygen saturation, her face was exposed. It was thought that the patient developed brainstem anaesthesia because she had rapidly lost consciousness and went into respiratory arrest within a few minutes.

Depending on the volume of anaesthetic agent used for the block, mydriasis, confusion, and sympathetic hyperactivity can develop, and apnoea and then loss of consciousness can also occur. In such a condition, serious interventions, like helping patients breathe via a mechanical ventilator, might be needed. The patient's clinical course will usually completely recover in a few hours. In line with this, in our case intubated mechanical ventilator support was given approximately for half an hour before the patient was extubated.

The needles that are used for peribulbar block are also included among the factors determining the incidence of complications of the central nervous system. It is suggested that the risk can be decreased by using needles shorter than 30 mm. With 38 mm retrobulbar needles, the rate of central nervous system complications is between 0.2% and 0.3% (6). In our case, the length of the needle was 25 mm, and the complications might have resulted from advancing the needle too far.

Although the application of ultrasound-guided blocks has some limitations, it is an irreplaceable technology for ocular evaluation. With the use of ultrasonography, the optic nerve, eyeball, anatomic structures, the route of the needle, and the spread of drug are synchronously viewed, and a safer and more qualified block can be obtained (11, 12). A significant drawback is that the application of ultrasonography takes a longer time, although this time can be considerably shortened with techniques that are well known and generally practised by the practitioner (11). In order to gain time in our case, peribulbar block was administered under the guidance of ultrasonography due to the large number of patients that were being operated on and the limitations in the operating room.

After retrobulbar block, the time of the onset of symptoms varies from 2 minutes to 40 minutes (13). In our case, respiratory depression caused probably by brainstem anaesthesia developed in only 7 minutes. The injection of the local anaesthetic agent into the subarachnoid space was considered because only respiratory depression and loss of consciousness developed.

Our case was similar to that reported by Rozentsveig et al. (14). The development of respiratory depression as quickly as 7 minutes, the extubation of the patient as oriented and cooperative in approximately one hour, and the lack of development of a serious cardiovascular condition supported our opinion that this was a case of brainstem anaesthesia.

Conclusion

Although brainstem anaesthesia due to peribulbar block is rarely seen, its possibility should not be ignored. In common ophthalmic surgeries like cataracts, strabismus, and trabeculotomy, patient monitoring should not be disregarded due to the short duration of the surgery or a large number of patients to be operated on. The operating room where ophthalmic surgery is performed should be ready and usable for emergency cases.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – L.K., B.Ş.G.; Design – L.K., A.Ş.; Supervision – A.Ş., B.E.; Resources – Ş.B., H.K.; Materials – L.K., Ş.B., A.Ş.; Data Collection and/or Processing – L.K., Ş.B., B.Ş.G.; Analysis and/or Interpretation – A.Ş., B.E.; Literature Search – L.K., Ş.B., A.Ş.; Writing Manuscript – L.K., A.Ş., B.E.; Critical Review – B.E, H.K.; Other – Ş.B., H.K., B.Ş.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Alhassan MB, Kyari F, Ejere HO. Peribulbar versus retrobulbar anaesthesia for cataract surgery. Cochrane Database Syst Rev 2015; 2: CD004083.
2. Tekin Y, Çağatay Ç. Oftalmik Cerrahide Lokal Enjeksiyon Anestezileri: Derleme. Turk J Ophthalmol 2009; 39: 496-505.
3. Boret H, Petit D, Ledantec P, Bénéfice S. Brainstem anesthesia after peribulbar anesthesia. Ann Fr Anesth Reanim 2002; 21: 725-7. [CrossRef]
4. Eke T, Thompson JR. Serious complications of local anaesthesia for cataract surgery: a 1 year national survey in the United Kingdom. Br J Ophthalmol 2007; 91: 470-5. [CrossRef]
5. Jaichandran VV, Nair AG, Gandhi RA, Prateeba-Devi N. Brainstem anesthesia presenting as contralateral third nerve palsy following peribulbar anesthesia for cataract surgery. Acta Anaesthesiol Taiwan 2013; 51: 135-6. [CrossRef]
6. Kumar CM. Orbital regional anesthesia: complications and their prevention. Indian J Ophthalmol 2006; 54: 77-84. [CrossRef]
7. Carneiro HM, Oliveira B, Avila MP, Alves Neto O. Brainstem Anesthesia after Extraconal Retrobulbar Block. Can It Be Avoided? Case Report. Rev Bras Anestesiol 2007; 57: 391-400.
8. Bensghir M, Badou N, Houba A, Balkhi H, Haimeur C, Azendour H. Convulsions during cataract surgery under peribulbar anesthesia: a case report. J Med Case Rep 2014; 8: 218. [CrossRef]
9. Kumar CM. Orbital regional anesthesia: Complications and their prevention. Indian J Ophtalmol 2006; 54: 77-84. [CrossRef]
10. Yajati KG, Van Vuuren A, Aggarwal SP, Dubash D. The Sandwell technique of Sub-Tenon's infiltration anesthesia for cataract surgery and other ophtalmic procedures. Cataract Refract Surg 2007; 33: 750-1. [CrossRef]
11. Palte HD. Ophtalmic regional blocks: management, challenges and solutions. Local Reg Anesth 2015; 8: 57-70. [CrossRef]
12. Luyet C. Eichenberger U, Moriggl B, Remonda L, Greif R. Real-time visualization of ultrasound-guided retrobulbar block: an imaging study. Br J Anaesth 2008; 101: 855-9. [CrossRef]
13. Jericho B, Ulanski L. Contralateral Amaurosis After Retrobulbar Block For Vitrectomy Presenting Solely with Hypertension and Tachycardia. The Internet Journal of Anesthesiology 2009; 24: 2.
14. Rozentsveig V, Yagev R, Wecksler N, Gurman G, Lifshitz T. Respiratory arrest and convulsions after peribulbar anesthesia. J Cataract Refract Surg 2001; 27: 960-2.[CrossRef]