Monocular Blindness due to Central Retinal Artery Occlusion Post Spine Surgery

Vinod Agrawal, Munjal Satishkumar Shah, Himanshu Parmar, Saurav N Nanda, Jay Shah

ABSTRACT
Postoperative visual loss (POVL) after spine surgery is a rare but devastating complication. A recent population-based, retrospective study conducted through NIS in United States, reported an overall incidence of visual disturbance after spine is 0.094%. We describe a 62-year-old patient operated for cervical and lumbar canal stenosis in prone position, unfortunately developed blindness in his left eye due to central retinal artery occlusion.

Keywords: Monocular blindness, Central retinal artery occlusion, Prone spine surgery.

INTRODUCTION
Postoperative visual loss (POVL) is rare but severe complication after a nonocular surgery. The incidence range from 0.0008 to 1% for all types of nonocular surgeries. The risk of POVL shown to be highest following spine surgery compared to other nonocular surgeries. A recent population based, retrospective study conducted through NIS in United States, reported an overall incidence of visual disturbance after spine is 0.094% among 4728815 cases operated between 1993 and 2002. Among these, 0.006% had ION and 0.001% had CRAO.

We describe a case of POVL due to central retinal arterial occlusion after prone cervical and lumbar surgeries.

CASE REPORT
A 62 years old gentleman presented with complains of neck and back pain since 6 months and both lower limb claudication since 2 months and numbness in left upper limb since 2 months. The claudication distance was 100 meters.

On neurological examination, power of both lower limbs and left upper limb were 4/5 with sensory hypoesthesia in bilateral L5 and left C5-6 dermatomes. Exaggerated deep tendon reflexes in all four limbs.

X-ray of cervical spine in AP and lateral views showed cervical spondylosis from C3-C6 and X-ray of lumbar spine showed grade 1 degenerative listhesis at L4-L5 level magnetic resonance imaging (MRI) suggestive of significant canal stenosis from C3-C6 and L4-5 level.

He weighed 58 kg and was 175 cm tall with a body mass index (BMI) of 18.94. He was on regular medication for hypertension and ischemic heart disease. CABG was done 2 years back. We had stopped blood thinners a week prior to surgery. He did not have tobacco or alcoholic addiction. Preoperative blood pressure was 130/70 mm Hg, and hemoglobin was 14.4 gm%.

He was operated in prone position with proper gel padding over bony prominences. A horse-shoe headrest with proper eye padding was used to protect his eyes. He was induced with injection propofol (80 mg) and injection fentanyl (100 μg). Injection atracurium (50 mg) was used for neuromuscular relaxation.

He underwent a lumbar decompression with intertransverse fusion and stabilization at L4-5 level and posterior cervical decompression C3-C6 under general anesthesia. His blood pressure was 130/60 mm Hg immediately after induction but it was once reduced to 80/50 mm Hg for 15 minutes and later maintained at around 130/70 mm Hg during the surgery. An arterial line was inserted in left radial artery to monitor blood pressure till the end of surgery.

Total surgical time was 2 hours and 40 minutes with intraoperative blood loss of 600 ml. Intraoperatively and in the recovery room, 2 units of crystalloids and 1 unit of colloid were infused. Total amount of fluid given was 1.5 liters. Intraoperatively, his urine output was 150 ml. Post surgery day 1 his hemoglobin dropped to 10.6 gm%.

Immediate postoperatively, he had painless vision loss in his left eye without periorbital edema. Urgent ophthalmology consultation was made. Visual acuity of left eye had no perception of light. There was a relative afferent papillary defect (RAPD) on the left side. The fundus examination was done and showed cherry red spot. A presumptive diagnosis of postoperative visual
loss was made secondary to central retinal artery occlusion (CRAO). He was given ocular massage for 10 minutes and anterior chamber paracentesis was performed to dislodge the thrombus.

Intravenous steroids, mannitol and nitroglycerine started immediately and continued for 1 more day. Topical latanoprost, dorzolamide and prednisolone eye drops were given and continued for 2 weeks.

Same day evening, patient had visual acuity of perception of light. At 2 weeks follow-up, he was able to do counting of fingers from 3 meters distance, that was unchanged till 6 months.

DISCUSSION

Postoperative visual loss is a devastating complication after a nonocular surgery. Most commonly, it presents as decreased visual acuity but visual field defects have also been reported as well.3

The most common postoperative visual loss defects are related to ischemic optic neuropathy (ION), central retinal arterial occlusion and cortical blindness.4

CRAO is thought to be caused by external ocular compression.6 This pressure leads to increased intraocular pressure above the systolic blood pressure to cause retinal ischemia.7 In our patient, possibility of improper positioning of patients’ eyes compressing on head rest might have caused the blindness.

Similar complication has been reported by Grossman et al with use of horseshoe headrest.7 In a study by Hunt et al confirmed that IOP rises significantly in prone anesthetized patient compare to supine.8 It was also found that 10° of reverse Trendelenburg position normalized the ocular pressure while prone.9

Duration of surgery is also a contributing factor. Our patient undergone 2 hours 40 minutes of prone spine surgery. Retina can tolerate pressure-induced ischemia for 95 minutes and still recover. It suffers permanent damage after 105 minutes of ischemia in an experiment on rhesus monkeys.10

Uncontrolled hypertension, anemia, diabetes mellitus, morbid obesity, peripheral vascular disease, hypovolemia, excessive blood loss also have been associated with CRAO.5

Visual loss from CRAO is almost always irreversible and there are no established effective treatment options available. Given the poor prognosis and lack of validated treatment options, it is essential to take prophylactic measures during surgery to prevent the development of POVL. Ocular massage and anterior chamber paracentesis can be tried to lower ocular pressure as we did with limited success.

CONCLUSION

Central retinal artery occlusion is a rare but serious complication related to prolong prone spine surgery. Preventive measures are essential because of limited treatment options and poor prognosis. Early diagnosis and interventions may help to improve visual acuity of a patient.

REFERENCES