

# Monocular blindness due to central retinal artery occlusion in bipolar hemireplacement arthroplasty of the hip

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## ABSTRACT

**Though rare, perioperative loss of vision after non-ocular surgeries is a disastrous complication. This has been reported after spine surgery or cardiopulmonary bypass surgery. We present an otherwise healthy 54-year-old man who underwent bipolar hemireplacement for a fractured neck of femur, and developed perioperative monocular visual loss due to central retinal artery occlusion, a complication hitherto unreported in hip replacement surgeries. The possible aetiological factors and the measures to prevent this complication are discussed.**

**Keywords: blindness, central retinal artery occlusion, hemireplacement arthroplasty, monocular blindness, perioperative visual loss**

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## INTRODUCTION

Fracture of the neck of femur is quite common in the elderly population. In this group, hemireplacement arthroplasty is the treatment of choice in a non-arthritis acetabulum. Mono- or binocular blindness after non-ocular surgeries is a rare, but disastrous complication. It is usually seen in spine surgery or cardiopulmonary bypass surgery. A thorough review of literature did not reveal such a complication after hip replacement surgery. We present a case report of a patient who developed monocular blindness of right eye after uncemented bipolar hemireplacement arthroplasty of the left hip.

## CASE REPORT

A 58-year-old man was admitted to the trauma centre for complaints of pain in his left hip, which prevented him from walking. He had sustained a fall three weeks before. His past personal, medical, allergy, family and treatment histories were not contributory. Physical examination revealed external rotation and shortening of the left lower limb with tenderness over the anterior joint line of left hip joint. Movements were painfully restricted. Radiographs of the left hip revealed a displaced fracture of the neck of femur (Garden type 4). The acetabulum was normal.

A decision of bipolar hemireplacement arthroplasty was made. The patient was subjected to preoperative work-up. Haemoglobin (Hb) was 7.4 g/dL and haematocrit (Hct) was 24.2%. Other blood investigations were within normal limits. Chest radiograph was normal. His baseline average blood pressure was 130/90 mmHg. Cardiology evaluation, including echocardiography, revealed normal left ventricular function. He was nondiabetic, a nonsmoker and non-hypertensive. His lipid profile was normal. Two units of packed cells were transfused preoperatively raising his Hb up to 9.9 g/dL with Hct of 29.5%.

The patient was positioned in the right lateral position on the operation table. The gluteal and perineal posts helped to maintain his right lateral position, with additional pillows placed in the front and at the back of the chest to stabilise the trunk. The operation table remained horizontal throughout procedure. Uncemented bipolar hemireplacement arthroplasty was performed through the posterior approach under spinal anaesthesia. The prosthesis was inserted as a press fit with minimal canal broaching. Throughout the surgery, the patient's vital parameters remained stable. One unit of packed cells was transfused intraoperatively.

During the transfer to the postoperative recovery room, the patient complained of blurring of vision in his right eye. Within minutes, the loss of vision in the eye was total. A senior ophthalmic consultant evaluated the patient. His pulse, blood pressure, electrocardiogram, oxygen saturation were normal. The patient was fully conscious, cooperative and well oriented in time, place and person. Complete neurological examination was normal. The external examination was normal. Ocular motility and intraocular pressure were normal. Direct fundoscopic examination revealed pale retina, pale disc with blurred nasal margin, cattle wiring of vessels and a cherry-red spot. All these findings were consistent with acute central retinal artery occlusion. Right afferent papillary defect was present. Right eye massage was instituted immediately and he was asked to breathe into a plastic bag. Sublingual nitroglycerine and carbonic anhydrase inhibitors were started. Anterior chamber paracentesis was done. Laboratory workup revealed Hb of 10 g/dL and Hct of 30%.

Intraoperative anaesthesia record revealed no

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episodes of hypertension or hypotension. There was no pressure over the eye. After 24 hours, perception of light was positive. Fundoscopic examination revealed retinal whitening and a cherry-red spot. There was no periorbital oedema. Ocular motility was normal. Repeat echocardiography examination was normal. There was no evidence of thrombus or vegetations in the heart or carotid artery. The colour Doppler scan for lower limb and pelvic veins were normal. Since there were no other neurological localising signs, magnetic resonance imaging of the brain was not required.

There was a slight visual improvement over seven days and perception of hand movements was present. Sutures were removed on the tenth day and the patient was discharged on the advice of the ophthalmologist with an instruction to review after three weeks. At this review, he was found to suffer from microcytic hypochromic anaemia. Stool was positive for occult blood. He underwent upper gastrointestinal endoscopy which revealed chronic gastritis with punctuate bleeding. He was treated by a gastroenterologist for the chronic gastritis. On further follow-up, there was no clinical improvement in the vision of the affected eye.

## DISCUSSION

Symptomatic visual loss in non-ocular surgery occurs as infrequently as one in 60,965 anaesthetic procedures.<sup>(1)</sup> It is most frequently seen in cardiopulmonary bypass surgery<sup>(2,3)</sup> and spine surgery,<sup>(4-6)</sup> with incidence varying from 0.05% to 1%.<sup>(7)</sup> The common causes of acute vision loss are usually anterior or posterior ischaemic neuropathy of the optic nerve, central retinal vein occlusion, central retinal artery occlusion, cortical blindness and miscellaneous (e.g. drug-induced). The aetiology of the injury to the eye is unknown in most cases, but is probably multifactorial.<sup>(8,9)</sup> Predisposing factors for perioperative acute visual loss are hypertension, smoking, diabetes mellitus, hyperviscosity syndromes (sickle cell anaemia, polycythemia vera), narrow angle glaucoma, cardiac disease, arteriosclerosis and collagen vascular disorders.<sup>(8-10)</sup> Precipitating factors are prolonged hypotension, venous hypertension, anaemia, globe pressure,<sup>(11)</sup> prone or Trendelenburg position and prolonged surgical time.<sup>(6,8-10)</sup>

This case is unusual, as the patient was a healthy adult male who was non-hypertensive, nondiabetic and a nonsmoker. All his preoperative blood investigations, including cardiac workup, were normal except for anaemia. Theoretically, he was at risk of developing such a complication due to anaemia. Anaemia was corrected to 9.9 g/dL with blood transfusion before surgery, even though he remained anaemic according to World Health Organisation standards, which state that a haemoglobin level in an adult male of less than 13 g/dL is considered to be anaemia. He underwent hemireplacement of the left hip in the right lateral position, in which such a complication

has not yet been reported. There was no episode of hypotension and no excess blood loss. Surgery was completed in one and half hours. There was no pressure padding over the eye or chest. He also received one unit of packed cells transfusion which would have negated some intraoperative anaemia.

However, apart from anaemia, there are a few other hypothetical postulates in this case. The anaemia, a predisposing factor, was neither sudden nor severe and was moderately corrected (9.9 g/dL) in this patient. Whether this level of anaemia was severe enough to cause blindness is a question that remains unanswered. The chest strap applied to hold the pillows in front and at the back of the chest could have caused venous hypertension and increased the intraocular pressure. Broaching of the canal could have raised the intraosseous pressure, leading to embolisation of fat globules, leading to central retinal artery occlusion. However echocardiography had ruled out septal defect and patent foramen ovale—the other possible predisposing factors.<sup>(12)</sup>

Though our patient was theoretically anaemic, and anaemia is a known factor which can cause perioperative visual loss, the other known factors for sudden perioperative loss of vision, if any, are not obvious in this case. It remains a serious complication. The surgeon and anaesthetist should be aware of this complication and its predisposing factors, so that it can be prevented.

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