# Life-threatening Hypotension in the Immediate Postoperative Period of Cataract Surgery under Topical Anesthesia: A Report of Two Cases

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#### Abstract

Cataract surgery is worldwide done under topical anesthesia in an outpatient basis with a complication rate less than 0,1%. We describe two cases of severe life-threatening hypotension needing anesthetic resuscitation. We recommand ophtalmogists to perform this very frequent surgery with an anesthetist on call to manage extremely rare life-threatening complications

# INTRODUCTION

Cataracts are the leading cause of blindness worldwide, affecting 20% of people aged 65 years and 60% of those older than 85 years. Globally, an estimated 94 million people are visually impaired and 20 million are blind due to cataracts<sup>1</sup>. The only effective treatment to restore vision is cataract surgery<sup>2</sup>, which is the most performed surgical procedure globally. In the last few decades, technological advances in phacoemulsification, foldable intraocular lenses, and surgical safety procedures have allowed cataract surgery to be performed essentially in ambulatory centers. Topical anesthesia with eye drops is now the most widely used method; hence, the need for an anesthesiologist during the procedure is rare.

Cataract surgery is a very safe procedure with few patients experiencing serious sight-threatening adverse events<sup>3</sup> and has an estimated morbi-mortality rate between 0.01% and  $0.05\%^2$ , which is similar to the risk for the general population. Therefore, more than 99% of cataract surgeries are performed in an outpatient setting<sup>4</sup> and more frequently without the presence of an anesthesiologist. Office-based cataract surgeries with no anesthesiologist available have also been reported<sup>4</sup>.

Even though the rate of systemic complications after cataract surgery is extremely low, the following two cases highlight the importance of having an anesthesiologist present to managing potentially life-threatening complications.

# FINDINGS

In our institution, all cataract surgeries are performed in the ambulatory center. Patients are asked to complete a health questionnaire, and most of them are seen for a preoperative evaluation. Patients may or may not be asked to fast prior to surgery, depending on the surgeon. Usual medications, including anticoagulants, are continued. An intravenous line is placed on arrival and an anesthesiologist (assistant or nurse anesthesiologist always supervised by a senior) is present in the operating room.

Case 1

The first patient was an 81-year-old woman classified per the American Society of Anesthesiologists (ASA) Physical Status Classification System as ASA II due to hypothyroidism, hypertension, pulmonary embolism, gastric ulcer, and hepatitis B. She had no history of allergy. She underwent an uncomplicated cataract surgery for the first eye on September 7, 2020, and she presented 2 weeks later for the second eye. According to her surgeon, she did not fast. The surgery was performed uneventfully and no intervention by the anesthesiologist was necessary. Postoperatively, while escorting the patient toward her room, she complained of chest pain and discomfort before falling unconscious with loss of urine. The Glasgow Coma Scale score was 3/15, heart rate (HR) was 140 per minute, and blood pressure (BP) was unrecordable; thus she was immediately intubated, resuscitated, and hemodynamic parameters were stabilized with intravenous fluids and norepinephrine support before transfer to the Intensive Care Unit (ICU). On clinical examination after arrival to the ICU, she was noted to have palpebral and labial edema and lower limbs rashes. Stroke and pulmonary embolism were excluded by cerebral and chest computed tomography (CT) scans. After 24 hours, the vasopressor support was weaned, and the patient was extubated; she was discharged the following day. The CT scan showed a pulmonary focus; as the patient did not fast, this was considered to represent pneumonitis due to aspiration, and she was treated with antibiotics. Tryptase, a specific marker for anaphylaxis, was significantly increased, confirming the hypothesis of anaphylactic shock. Three months later, she underwent cutaneous allergic tests again due to the occurrence of another anaphylactic shock, which was treated effectively by epinephrine and corticoids. An allergy to cefuroxime was confirmed. This antibiotic is administered intraocularly at the end of each cataract surgery to prevent endophthalmitis, and we believe that sensitization to this molecule occurred during the first surgery leading to anaphylactic shock at the second operation.

# Case 2

The second patient was a 77-year-old healthy woman classified as ASA II due to hypothyroidism and rhizomelic pseudo-polyarthritis treated with 4 mg methylprednisolone (Medrol). She had no history of allergy. Cataract surgery for the first eye was performed on June 24, 2021, without any complications, and she presented for the second eye on July 19, 2021. According to her surgeon, she fasted. The surgery went smoothly without any intervention from the anesthesiologist. At the end of the surgery, the patient was escorted to her room where she received a light meal and waited approximately 30 minutes before leaving. At this time, she felt discomfort with nausea; her BP was 60/30 mmHg and HR was 30 per minute. Atropine (0.25 mg) was administered through the intravenous line and her BP and HR increased to 90/50 mmHg and 80 per minute, respectively. She was placed under surveillance in the Postoperative Acute Care Unit where she developed vomiting, agitation, and a sudden desaturation to 88% under 6 liters of oxygen while BP and HR normalized. Her chest radiograph showed a small right perihilar infiltrate that could not explain such a desaturation. She was transferred to the emergency department where chest CT with contrast was performed, which revealed bibasal pneumonitis and no pulmonary embolism. COVID-19 investigations were negative. Cardiac echography was normal. After a few hours of noninvasive ventilation, she recovered and her oxygen saturation normalized. She was transferred to the Pneumology Department for antibiotic therapy and discharged after 3 days without any complications. Tryptase was not significantly high and unfortunately, the patient did not wish to perform any other tests to confirm the anaphylactic reaction hypothesis.

#### DISCUSSION

Cataract surgery is the most performed surgery worldwide. Due to recent technological advances and improvements in the safety of the procedure, most surgeries are now performed using topical anesthesia with eye drops; therefore, anesthesiologists are rarely required during the procedure. Murray et al.<sup>5</sup> reported only one serious adverse event in a series of 6661 cataract surgeries and concluded that most cataract surgery procedures under local anesthesia could be safely performed without the presence of an anesthesiologist.

We described two cases of life-threatening adverse events associated with cataract surgery; resuscitation was needed in the first patient and ventilation support for the second. An anaphylactic reaction was confirmed in the first case, but this result was less clear in the second case, even though the clinical manifestations suggested an anaphylactic reaction, the patient did not wish to undergo allergy tests. Anaphylactic reaction following intracameral cefuroxime injection is extremely rare. To the best of our knowledge, only one case has been reported in the literature of a patient with a history of penicillin allergy<sup>6</sup>; this was not the case in our first patient. In accordance with Moissaiev and Levinger<sup>7</sup>, we believe that ophthalmologists performing cataract surgery should be aware of this very rare life-threatening complication and that an anesthesiologist should be present in or near the operating room. Systemic complications such as hypertension and agitation are frequent and may require the intervention of the anesthesiologist<sup>8</sup>.

Our two patients also presented with pneumonitis probably caused by inhalation. Hence, we recommend that patients fast for at least 6 hours for solids and 2 hours for liquids prior to cataract surgery<sup>9</sup>.

## CONCLUSIONS

Perioperative anesthetic care in cataract surgery is still debated and practices vary worldwide. Even though several studies have been published on the safety of a protocol without an anesthesiologist present in the operating room, we recommend cataract surgery be performed for patients who fasted, in a center with immediate availability of an anesthesiologist because life-threatening complications, such as anaphylactic reactions, may require immediate intervention by resuscitation. We therefore do not recommend office-based cataract surgeries without an anesthesiologist present.

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