

## CASO CLÍNICO

# Eye Enucleation Under Regional Anesthesia: A Case Report

## Enucleação Ocular Sob Anestesia Regional: Caso Clínico

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### Afiliação

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### Keywords

Anesthesia, Conduction; Eye Enucleation

### Palavras-chave

Anestesia por Condução; Enucleação Ocular

## ABSTRACT

**Introduction:** The role of regional anesthesia in ophthalmic surgeries as an alternative to general anesthesia has been described to improve patient comfort and pain, as well as surgical conditions. We report the first case of eye enucleation performed under regional anesthesia at our University Hospital Center.

**Case Report:** Eighty three years-old, male, Caucasian, ASA III, diagnosed with iris melanoma with extra-scleral invasion, proposed for enucleation of the left eye. We performed peribulbar (infratemporal and caruncular approaches), supratrochlear, supraorbital and infraorbital nerves blocks using 0.75% ropivacaine (8 mL, 2 mL, 2 mL and 2 mL, respectively) as anesthetic technic. The surgery underwent uneventfully.

**Conclusion:** Regional anesthesia can be an effective alternative to general anesthesia in eye enucleation, namely in patients with comorbidities and in ambulatory context.

## RESUMO

**Introdução:** Na anestesia para cirurgia oftalmológica, a administração de anestésicos locais como coadjuvantes da anestesia geral tem sido descrita como tendo vários benefícios, nomeadamente, criando melhores condições de hemostase, menor incidência de reflexo oculocardíaco, maior conforto e satisfação do doente no pós-operatório. No entanto, muito pouco foi publicado no sentido de apoiar a anestesia regional como uma alternativa segura e eficaz à anestesia geral em oftalmologia. Descrevemos um caso de enucleação ocular realizada, pela primeira vez, sob anestesia regional, no nosso Centro Hospitalar Universitário.

**Caso Clínico:** 83 anos, sexo masculino, caucasiano, ASA III, IMC 26,79 kg/cm<sup>2</sup>, com diagnóstico de melanoma de íris com invasão extra-escleral do olho esquerdo, proposto para enucleação do olho esquerdo. Como técnica anestésica, foram realizados os bloqueios dos nervos peribulbar, supratroclear, supraorbital e infraorbital com ropivacaína a 0,75% (4mL, 2mL, 2mL e 2mL, respectivamente). A cirurgia decorreu sem intercorrências.

**Conclusão:** Cirurgias oftálmicas invasivas, como as enucleações, podem ser realizadas com segurança sob anestesia regional, podendo constituir uma alternativa eficaz à anestesia geral.

## INTRODUCTION

Traditionally, open globe surgeries were performed almost exclusively under general anesthesia (GA), being regional anesthesia (RA) reserved for patients who were considered high-risk candidates for general anesthesia.<sup>1</sup>

The rationale for using GA includes avoidance of patient movement and factors that may increase open globe pressure, such as the injection of local anesthetic.<sup>1</sup> On the other hand, it may lead to significant increases in operative time, as well as, longer postoperative recovery time.<sup>1</sup>

Recently, the role of regional anesthetic techniques has been increased due to a widely spread of minimally invasive surgical procedures, providing better postoperative pain control associated with a low rate of nausea and vomiting (PONV).<sup>1</sup>

Optimal surgical conditions (analgesia and akinesia) can be obtained with eye blocks avoiding general anesthesia risks, especially in elderly patients with concurrent comorbidities, allowing lower perioperative morbidity. Regional anesthesia also can be benefic in times of poor environment resources,

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with limitations to anesthetic personnel and equipment, hospital beds, recovery staff and overall allow a quicker turnover of patients with less cost.<sup>2,3</sup> The ability to perform safe and effective regional ophthalmic anesthesia will be an obligatory component of future anesthesia training, not only because of better pain control but also as a result of economic pressures that favor regional anesthesia, with general anesthesia being reserved for pediatric and deserving adult cases.

Enucleation is a surgical procedure that involves removal of the entire globe and its contents, with preservation of all other periorbital and orbital structures. Enucleation is typically employed in cases of large intraocular tumors, irreparable eye damage or unresponsive and intolerable pain in a blind eye.<sup>5,6</sup>

Accurate knowledge of the anatomy of the eye and the different anesthetic techniques are necessary to determine the appropriate block for specific clinical situations.

Sensory innervation of the face is provided by the trigeminal cranial nerve (CNV), which branches into the ophthalmic (V1), maxillary (V2) and mandibular (V3) nerves.<sup>7</sup> The ophthalmic nerve provides sensory innervation to the scalp, forehead, upper eyelid, conjunctiva and cornea. It also provides partial innervation to the nose, nasal mucosa and meninges.<sup>7</sup> The largest branch of the ophthalmic nerve is the frontal nerve, which then branches into the supratrochlear and supraorbital nerves. The supraorbital nerve exits the skull at the supraorbital notch located on the supraorbital rim.<sup>8</sup> The second division, the maxillary nerve (V2), exits the skull from the foramen rotundum. After giving off numerous branches, the maxillary nerve eventually enters the face through the infraorbital canal, where it ends as the infraorbital nerve. The infraorbital nerve supplies sensory branches to the lower eyelid, the side of the nose, and the upper lip.<sup>8</sup>

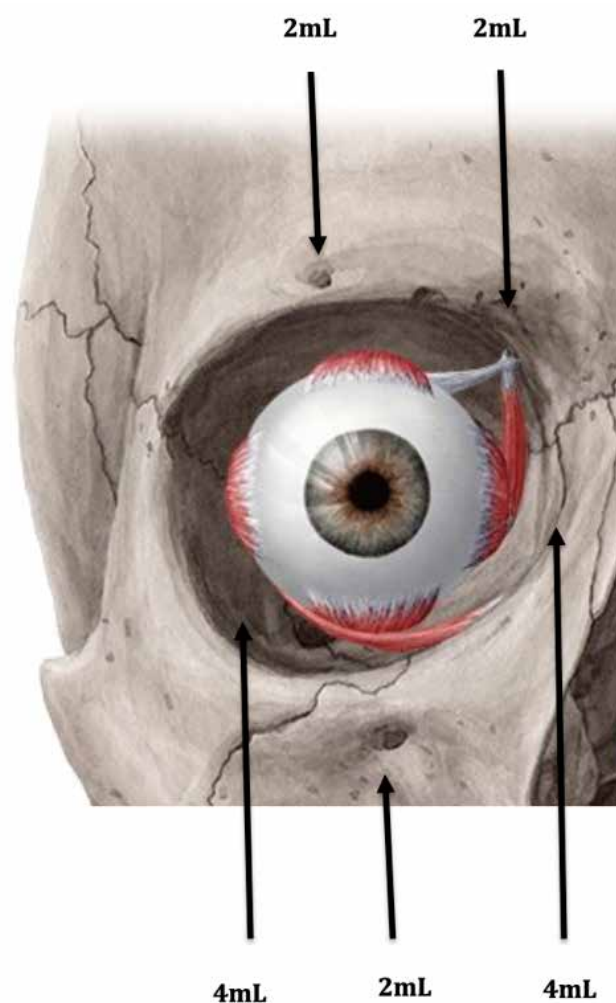
Considering the anatomy of the eye and its innervation, hereby, we report the first case of a successful eye enucleation performed under regional anesthesia in our Hospital Center.

## CASE REPORT

A 83 year-old man, Caucasian, ASA III, diagnosed with a left eye iris melanoma, with extra-scleral invasion and no metastasis was proposed for enucleation of the left eye. Medical history of arterial hypertension, hepatic cysts with no symptoms or abnormal hepatic function recent, chronic renal failure stage 3A (glomerular filtration rate (GFR) of 47.19 mL/min) and atrial fibrillation medicated with clopidogrel 75 mg (stopped 4 days prior to surgery).

Analytically presented microcytic anemia of 12.1 g/dL, urea of 58 mg/dL, 1.51 mg/dL of creatinine with no other alterations. Electrocardiography showed atrial fibrillation.

After explaining the advantages and disadvantages of the



**Figure 1. Eye blocks performed in milliliter with 0.75% ropivacaine**

different possible anesthetic approaches to the patient, a written informed consent was obtained to perform an eye enucleation under regional anesthesia.

The regional technique was performed under light intravenous sedation (midazolam 1 mg, fentanyl 0.05 mg) with patient monitored according to the ASA standards. After granting aseptic conditions, the following regional blocks were performed with 0.75% ropivacaine: caruncular and infratemporal approaches (4 mL each), supratrochlear (2 mL), supraorbital (2 mL) and infraorbital nerves (2 mL) (Fig. 1).

The sensory blockade was assessed by touching the cornea with a cotton swab. The motor blockade was assessed by checking for the absence of any movement of the eye. Both sensory and complete motor blockade were present 10 minutes after the block. It was made a 360° conjunctiva opening with Tenon debridement. The extraocular muscles, optic nerve and central retinal vessels were cut to remove the eyeball. An orbital implant of HA coated DIAM was applied and a Tenon's continuous suture was performed. The patient remained hemodynamically stable during the entire procedure (systolic blood pressure mean  $\pm$  SD 131  $\pm$  22 mmHg and heart rate mean  $\pm$  SD, 61  $\pm$  9 beats/min). He

reported no pain or discomfort during surgery. Analgesia was complemented with 1000 mg of intravenous paracetamol at the end of surgery.

Surgery lasted 75 minutes without surgical or anesthetic complications. The patient was discharged to the ward with no local pain complaints and no need for rescue analgesia.

Patient satisfaction scores with anesthetic technique were evaluated 24 hours after surgery using a numeric scale from 0 to 10, with a value of 9.

## DISCUSSION

As ophthalmic surgeries are performed with increasingly frequency in outpatient facilities, it is important to evaluate data concerning the use of regional anesthesia/sedation for surgery for open eye surgery.

As most recently published by Calenda *et al*, regional anesthesia with intravenous sedation offers a safe and effective alternative to general anesthesia during enucleation and evisceration procedures.<sup>9</sup> Some advantages include less major body system stress, obviation of potentially vasodilating agents that may encourage bleeding, more rapid postoperative recovery with better pain control and less incidence of PONV.<sup>9</sup>

Considering that ophthalmic surgery is currently one of the most common procedure among the elderly population, which is a high-risk surgical group with limited functional reserve and higher risk of complications and mortality (5% to 10%), our approach must be less invasive and interfere as little as possible with patient's pathophysiology.<sup>10</sup> Regional anaesthesia should always be an option, namely in this group of patients. Nonetheless, the decision for GA or RA should be made on an individual basis, taking in consideration many factors, including the knowledge of eye anatomy, the ability of the anesthesiologist to maintain light sedation without the risk of inducing apnea, the patient's perception and anxiety of "being awake" during eye surgery and the ophthalmic surgeon's comfort with this approach.

Combining the aforementioned factors, we believe that enucleation can be done safely and painlessly under regional anesthesia. An effective intraoperative pain control can reduce the incidence of pain after surgery, improving patient recovery and reducing costs.

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### Responsabilidades Éticas

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