Retrobulbar block: Risk factors

The retrobulbar block, once the gold standard of ocular regional anesthesia, provides excellent anesthesia and akinesis for ocular surgery. Its once wide prevalence is waning somewhat to peribulbar and subtenon blocks due to perceived increased risk of serious side effects. Several of those complications and risk factors are detailed below.

Myopia increases the anterior-posterior dimension of the eyeball and lengths greater than 26mm increase the risk of ocular perforation during retrobulbar block. The presence of staphylomas (typically on the posterior or inferior surface of the globe) also increases the risk of ocular perforation.

The ophthalmic artery runs through the ocular space superiorly and therefore this area should be avoided during retrobulbar block to minimize the risk of retrobulbar hemorrhage.

The retro-orbital space is 42-54mm from base to apex so needles longer than 38mm should be avoided to reduce the risk of retrobulbar hemorrhage. Longer needles run the risk of invading the apical space of the orbital cone where vascular structures are tightly packed.

Needles longer than 31mm are associated with an increased risk of optic nerve injury.

Having the patient look upward and inward rotates the neurovascular bundle lateral and inferior which is the typical approach for a retrobulbar block. Therefore, an upward and inward gaze during the block increases the risk of damage to these structures including the optic nerve.

Highly concentrated local anesthetic and large volumes (>5 mL) pose a risk of extraocular muscle injury.

Although I could not find any risk factors, I would be remiss if I did not mention the risk of spread of local anesthetic to the CNS and brainstem with a retrobulbar block..

Further Reading: https://www.e-safe-anaesthesia.org/e_library/06/Ophthalmic_anaesthesia_part_1_TOTW_135_2009.pdf