

Re-emergence of Subtenon's Block

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Ophthalmic surgeries are largely performed on day care basis and under regional blocks worldwide. Instillation of local anesthetic (LA) eye drops into the conjunctival sac, and peribulbar block are routinely used to provide analgesia and akinesia to the operative eye.[1] Facial nerve block and retrobulbar block are rarely performed now-a-days. Complications like globe perforation, retro-orbital hemorrhage, optic nerve injury, intravascular injection and spread of LA to the central nervous system are more common with retrobulbar and less with peribulbar blocks.[2] Subtenon's block is a relatively newer regional block found to be equally effective to more invasive blocks and is regaining popularity worldwide. Since it is not associated with any of the complications mentioned above, it can also be considered safer than other blocks. Tenon's capsule is a layer of connective tissue which surrounds the entire globe. Anteriorly it lies in close apposition to the conjunctiva and fuses with it at the limbus (corneo-scleral junction), and posteriorly it fuses with the duramater of the optic nerve. Subtenon's space is the virtual space between the sclera and tenon's capsule.[3] The patient should be explained about the procedure preoperatively as co-operation from the patient is a key for the success of this block. The patient is positioned supine and all standard, essential monitoring attached. The operative eye is cleaned with povidine iodine solution and LA eye drops are instilled to anesthetize the conjunctiva. A lid speculum is applied to get wide exposure and the patient asked to look upward and outward, targeting a point which brings the inferonasal quadrant of the globe into the center. About 5-10mm away from the limbus, a small tent of conjunctiva and Tenon's capsule is raised with the help of blunt atraumatic forceps, and a small incision made with ophthalmic scissors, to expose the underlying sclera. A blunt cannula is inserted into the sub Tenon's space and LA solution is injected, which bathes the

ciliary nerves resulting in sensory blockade and mydriasis. A significant amount of LA solution also diffuses into the retrobulbar cone along the external ocular muscles resulting in globe hypokinesia.[4] Usually 3ml of LA is sufficient to produce analgesia, while for akinesia 5ml of LA is required. Anesthetic effect last for 45-90 min while analgesic effect lasts for 5-6 hours depending upon the volume, concentration and adjuvant used. Drugs most commonly used are lignocaine 2% and bupivacaine 0.25 to 0.5% along with 150 IU of hyaluronidase for better penetration and spread of LA solution. Alternatively, 1% ropivacaine with 150 IU of hyaluronidase has an onset time comparable to above mixture but has the advantage of providing slightly longer (90-120 min) surgical anesthesia. Various randomized controlled trials (RCTs) using mepivacaine, prilocaine, and levobupivacaine are also reported in the literature, but no clinically significant difference in the quality and duration of block has been noted.[5- 8] Gouws P and colleagues [7] compared articaine and bupivacaine/lidocaine mixture for sub-Tenon's block in patients undergoing cataract surgery. Articaine 2% resulted in more rapid onset of motor blockade compared with bupivacaine/lidocaine mixture ($P=0.0076$). The authors concluded that articaine 2% is safe and effective for sub-Tenon's anaesthesia and is a suitable alternative to the traditional bupivacaine 0.5%/lidocaine 2% mixture. In another RCT, McLure HA et al [8] compared the onset of action, and quality of block using lidocaine 2% with levobupivacaine 0.75% for sub-Tenon's block in patients undergoing cataract surgery. A total of 91 patients were randomized to receive either 4 mL of lidocaine 2% ($n = 44$) or levobupivacaine 0.75% ($n = 47$) for sub-Tenon's block, both with hyaluronidase 15 IU/mL. The speed of onset was statistically significantly faster for lidocaine compared to levobupivacaine (3.02 vs. 5.06 min, $P < 0.001$). However, pain scores measured by a verbal analogue scale didnot significantly differed perioperatively or postoperatively in both the groups.

This block has found to be effective for cataract, vitro-retinal, glaucoma, and strabismus surgery, besides postoperative pain management and therapeutic delivery of drugs.[9] Patient's refusal, infection at the site of injection, myopic eye and previous history of scleral buckling are usual contra-indications for

performing the block. Possibility of globe perforation due to increased axial length (>25mm) and thin sclera in myopic patients should be kept in mind. This block is safe in patients taking anticoagulant and antiplatelet medications like aspirin, clopidogrel, and warfarin, though the possibility of subconjunctival hemorrhage cannot be completely ruled out. The reported minor complications include subconjunctival swelling and hemorrhage. The risk of permanent vision loss is negligible.[10-12] To summarize, Sub Tenon's block has many advantages over conventional blocks, as it is less painful, provides good intra-operative analgesia and akinesia, and avoids the use of sharp needles and their associated complications. In the coming years, use of this block by both anesthesiologist and ophthalmologist may supercede other regional blocks. Future RCTs using different LA combinations and adjuvants are likely to widen its implications and usage.

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