

Sub-tenon's block anesthesia

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Yadav V, Bisht C. Sub-block tenon's anesthesia. *Anesthesiol Case Rep.* 2022; 5(5):11-13.

ABSTRACT

In many places, Sub-Tenon's block has replaced other orbital regional anesthetic techniques as the most popular one. With fewer sight-threatening consequences than sharp needle procedures, it effectively anesthetizes the orbit. The majority of ophthalmic surgical procedures,

such as cataract surgery, vitreoretinal surgery, trabeculectomy, adult strabismus surgery, panretinal photocoagulation, optic nerve sheath fenestration, long-term postoperative pain management, therapeutic drug delivery, and many others, are suitable for Sub-Tenon's Block.

Key Words: Anesthesia; Local anesthetic; Regional anesthesia; Sub-tenon's block; Optic nerve

INTRODUCTION

Turnbull originally described Sub-Tenon's Block (STB) in 1841, and Swan followed in 1956 [1]. Several researchers revisited it in the 1990s, and it has since gained more and more acclaim globally [2,3]. In many nations, it is currently the regional orbital block that is used most commonly. Sharp-needle procedures have significant theoretical disadvantages compared to sub-tenon anesthesia, but the evidence is mounting that these disadvantages are being realized in clinical practice.

SUB-TENON'S BLOCK TECHNIQUE

STB falls within the category of an episcleral method. A needle or blunt probe can be used to administer local anesthesia. Until later CT scans revealed that the local anesthetic solution actually entered the sub-tenon's area, the medial canthal procedure was initially believed to be a peribulbar technique [4]. The use of a blunt probe is the recommended method since one of the main advantages of the sub-tenon's technique is the avoidance of passing sharp needles into the orbit. The block can be carried out in any quadrant; however, the single-injection inferonasal method has the benefit of being carried out distant from the normal surgical site and the points at which the superior and inferior oblique muscles insert [2-7].

The dense, fibrous covering of elastic tissue known as Tenon's capsule surrounds the eye and extraocular muscles in the orbit (Figure 1). It has sleeves along the extraocular muscles and originates at the limbus. It then extends posteriorly to the optic nerve. Tenon's capsule is split into anterior and posterior sections by the rectus muscles. From the limbus posteriorly, anterior Tenon's capsule adheres to episcleral tissue for about 10 mm. For the majority of this

distance, it is united with the intramuscular septum of the extraocular muscles and the overlying bulbar conjunctiva. Posterior the optic nerve and the globe are separated from the contents of the retrobulbar space by Tenon's capsule, which is thinner. Therefore, there may be a space posterior to Tenon's capsule between the sclera and that structure. Dissemination along the extraocular muscle sheaths, diffusion into the retrobulbar space, spread into the fascial planes surrounding the lids, and direct action on the nerves supplying the globe that pass through this area are all made possible by local anesthetic delivery into this space.

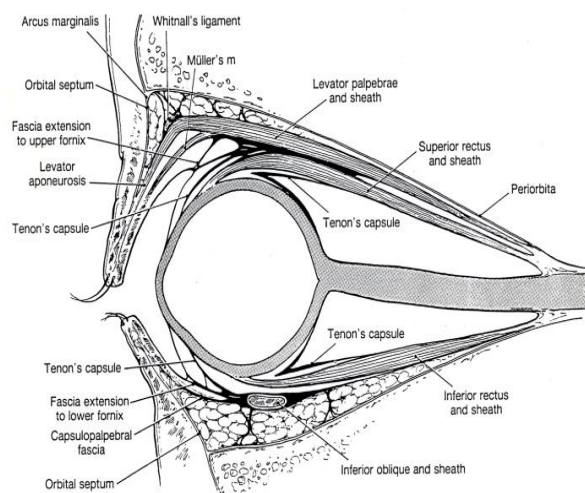


Figure 1) Anatomy of Tenon's capsule.

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Received: 6 Sep, 2022, Manuscript No. pulacr-22-5567, Editor assigned: 7 Sep, 2022, Pre QC No. pulacr-22-5567 (PQ), Reviewed: 21 Sep, 2022, QC No. pulacr-22-5567 (Q), Revised: 23 Sep, 2022, Manuscript No. pulacr-22-5567 (R), Published: 27 Sep, 2022, DOI: 10.37532. pulacr-22.5.5.11-13.



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ADVANTAGES OF SUB-TENON'S ANESTHESIA

Less painful than traditional blocks

In a study of 6000 sub-tenon blocks, it was discovered that more than 68% of patients experienced no discomfort at all, and less than 1.5% reported more than mild to moderate pain [8]. As opposed to patients who had a retrobulbar block, this. Additionally, doing an STB is more pleasant than a peribulbar block [9].

Good akinesia

When compared to individuals who underwent retrobulbar procedures, patients who received sub-tenon's were reported to have greater degrees of akinesia [8].

Low risk of sight-threatening complications

According to anecdotal evidence, over 35,000 sub-tenon blocks have reportedly been completed in the author's area without any issues endangering vision. This is comparable to the finest outcomes produced by using sharp needle procedures [10].

COMPLICATIONS OF SUB-TENON'S ANESTHESIA

Optic neuropathy

It has been demonstrated that all regional anesthetic procedures, including retrobulbar, peribulbar, and STB, lower ocular pulse amplitude for at least 10 minutes after the procedure is completed [11,12]. This decrease takes place without an increase in IOP. There are only a few documented instances of ischemic optic neuropathy leading to vision loss in the literature [13,14]. The majority of these cases shared the common trait of being connected to non-intraocular operations, which meant that the eye was not opened and the IOP was not atmosphericized throughout the treatment.

Central spread

It is likely that local anesthetic could spread down the optic nerve sheath since certain anatomical studies of the sub-tenon's space suggest that it may be a lymphatic region that drains along the sheath. Using the Westcott scissors too deeply could conceivably result in an unintentional puncture of the optic nerve sheath. Two cases of momentary loss of consciousness and one death that may have been brought on by central dissemination of local anesthetic to the brain stem after STB have been reported [15]. Remember that this issue is far less common than with a retrobulbar block.

Orbital cellulitis

Only two cases of orbital cellulitis following sub-tenons block have been reported so far. A corneal infection was present in one patient at the time, and in the other case, the surgeon did not apply povidone-iodine prior to the block [16,17].

CONCLUSION

In many centers, STB has surpassed other regional orbital anesthetic techniques in terms of popularity. It offers very favorable analgesic and working conditions while preventing the insertion of pointy needles into the orbit. Studies have demonstrated that the risk of major consequences is extremely low and that they occur far less frequently than with other methods of ocular regional anesthesia.

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