

An anatomical illustration of a human eye. A syringe is shown injecting fluid into the sub-Tenon space, which is the area between the Tenon's capsule and the sclera. The illustration is in a realistic style with warm tones.

Incision-Free Sub-Tenon Anesthesia

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**SOCIETY FOR
SAMBA[®] ULATORY
ANESTHESIA**

Outpatient • Office Based • Non-Operating Room

Disclosure

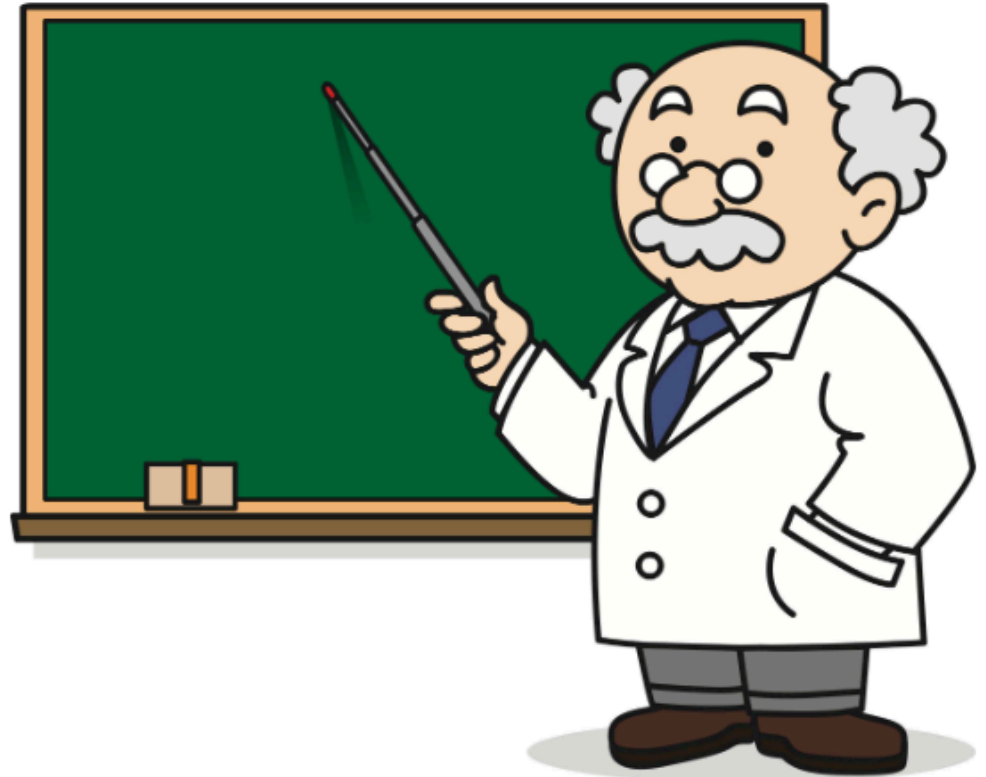
- I have no financial relationships with commercial support
- Written consent obtained for photographic and audiovisual content



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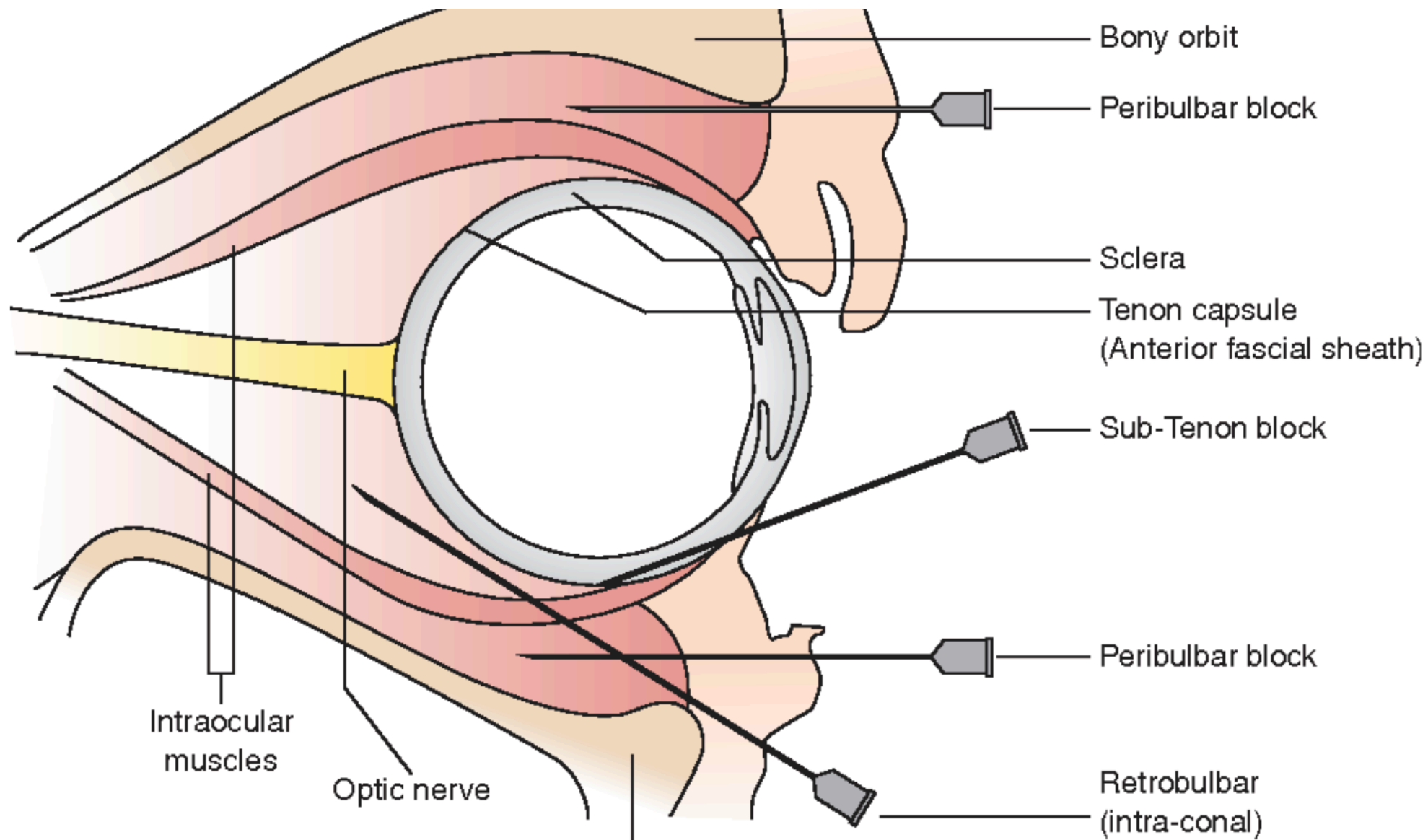
Learning Objectives

1. Describe the anatomy and function of Tenon capsule
2. List eye surgeries appropriate for sub-Tenon block
3. Enumerate three advantages of cannula-based ophthalmic anesthesia
4. Outline the technique of incision-free sub-Tenon anesthesia



Tenon Capsule

- Fascia bulbi
- Thin membrane
- Envelops eyeball
- Extends from optic nerve to limbus
- Separates eyeball from orbital fat
- Facilitates movement



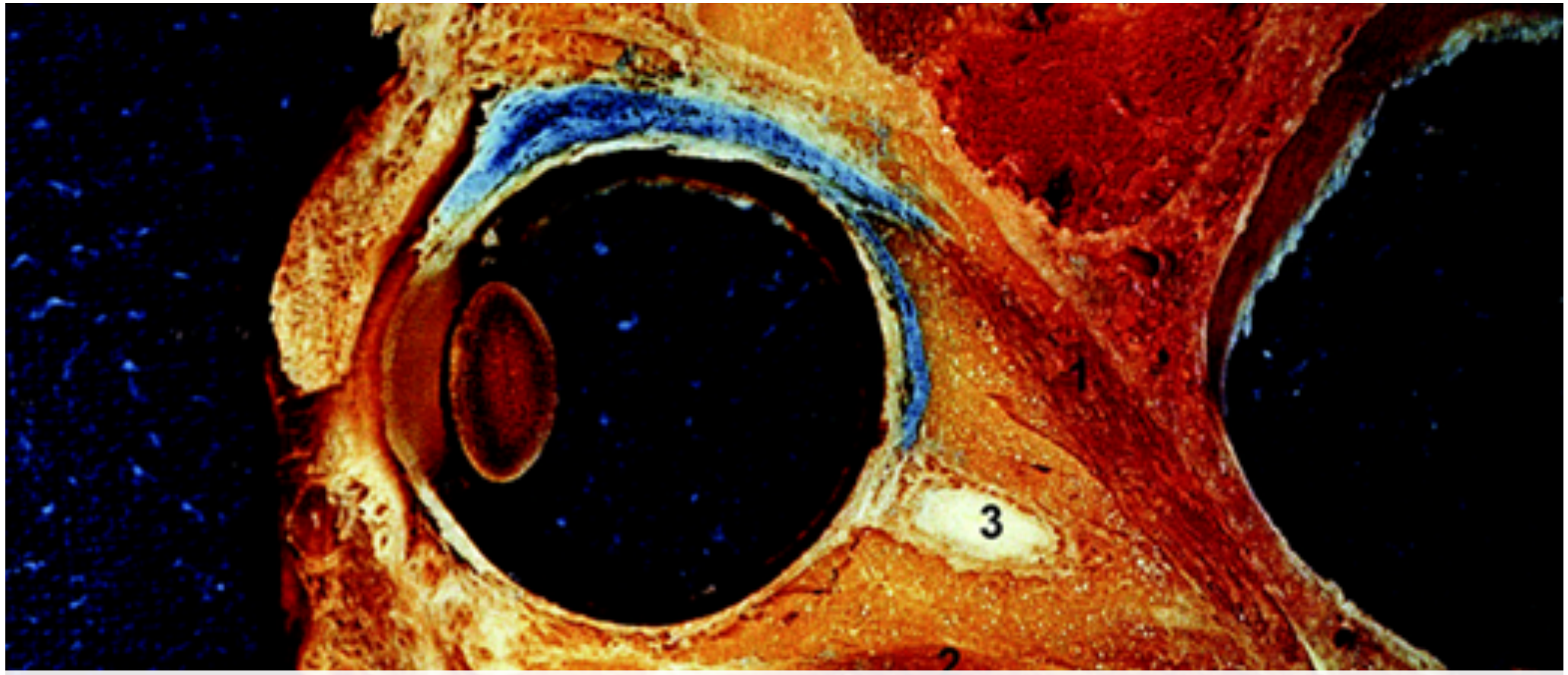
Sub-Tenon Anesthesia

- Sensory block

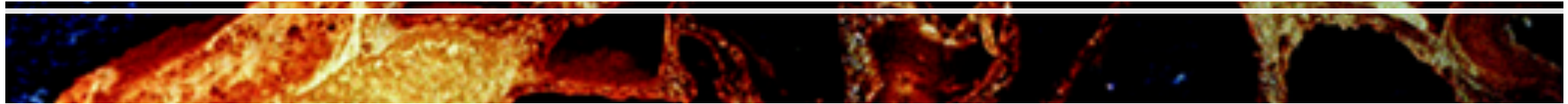
Short ciliary nerves → Tenon capsule → globe

- Motor block

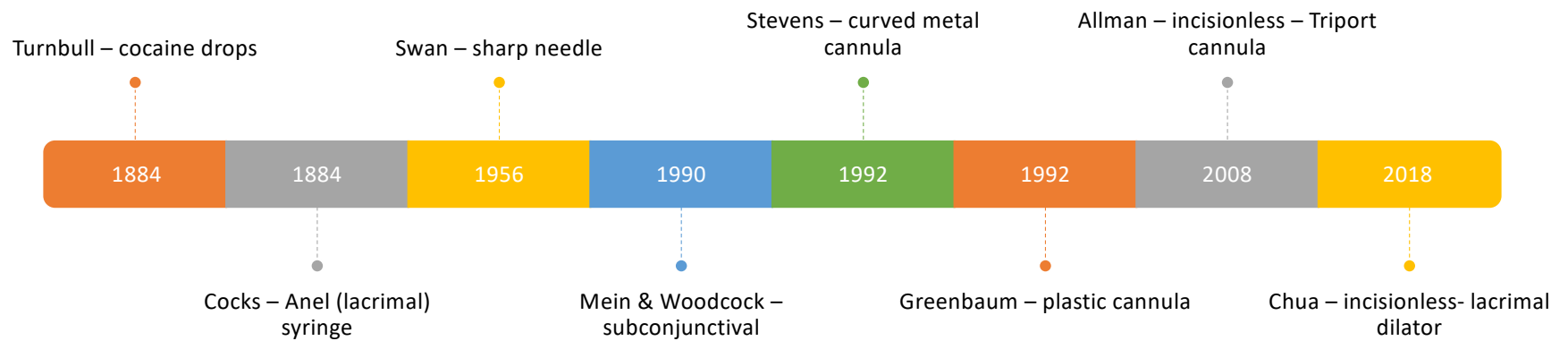
Akinesia – LA → extraocular muscle sheaths → intraconal space
↓
fascial plane lids



Cadaver Stain



Timeline



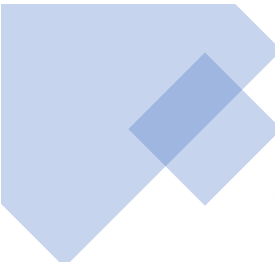
Sub-Tenon Block for Cataract Surgery
Chua M, Lersch F, Chua A et al.
Eye: February 2021



Country	Sub-Tenon's block % (year of survey)
Canada	31% (2010) [84] 61% (2018) [84]
Japan	63% (1999) [85]
Korea	42% (2012) [86]
New Zealand	86% (2007) [87]
Singapore	5% (2004) [88] 7% (2016) [89]
United Kingdom	42% (2003) [79] 50.5% (2013) [56]
United States of America	5% (2003) [92]

Efficacy

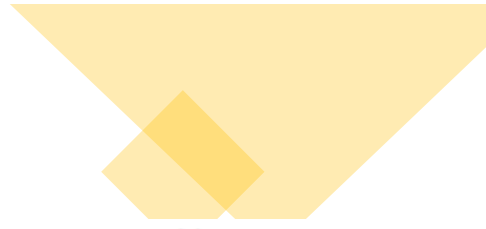
	Stevens ¹	Roman et al ²	Guise ³	Kumar et al cannula
Pain during block (%)	18	1	32	
Pain during surgery (%)	4	3	7	0/0/0
Complete akinesia after block (%)	54	0		46/50/4
Complete akinesia after surgery (%)		0		
Chemosis (%)		85	56	76/20/3
Subconjunctival haemorrhage (%)	34% (>1 Quadrant)	56	7	56/20/2



Advantages and disadvantages of sub-Tenon's block

Advantages	Disadvantages
Virtually painless	Subconjunctival hemorrhage
Good analgesia	Chemosis
Good akinesia	Care with scleral buckles
Avoids complications of sharp needles	Associated with rare reports of sight-threatening complications
Low risk of serious complications	
No facial block required	
Safer in anticoagulated patients	
Safe in eyes with long axial length	
Minimal/no rise in IOP	





Limitations and relative contraindications of sub-Tenon's block (modified from Kumar and Dodds)³⁰

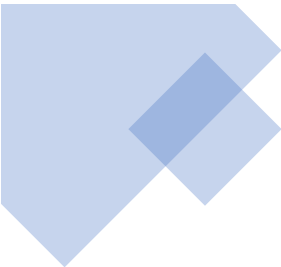
Limitations

- Previous sub-Tenon's block in the same quadrant
- Previous extensive vitreo-retinal surgery
- Previous repeated strabismus surgery
- Eye trauma
- Infection to the orbit

Relative contraindications

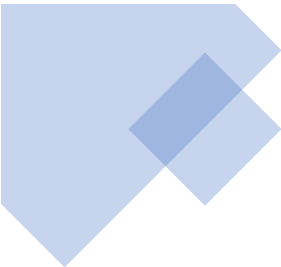
- Severe ocular pemphigoid
 - Surgery requiring complete akinesia (viscacanaltomy)
 - Surgery where chemosis and subconjunctival haemorrhage may compromise the outcome of surgery (glaucoma filtration surgery)
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Complications of Sub-Tenon's Block

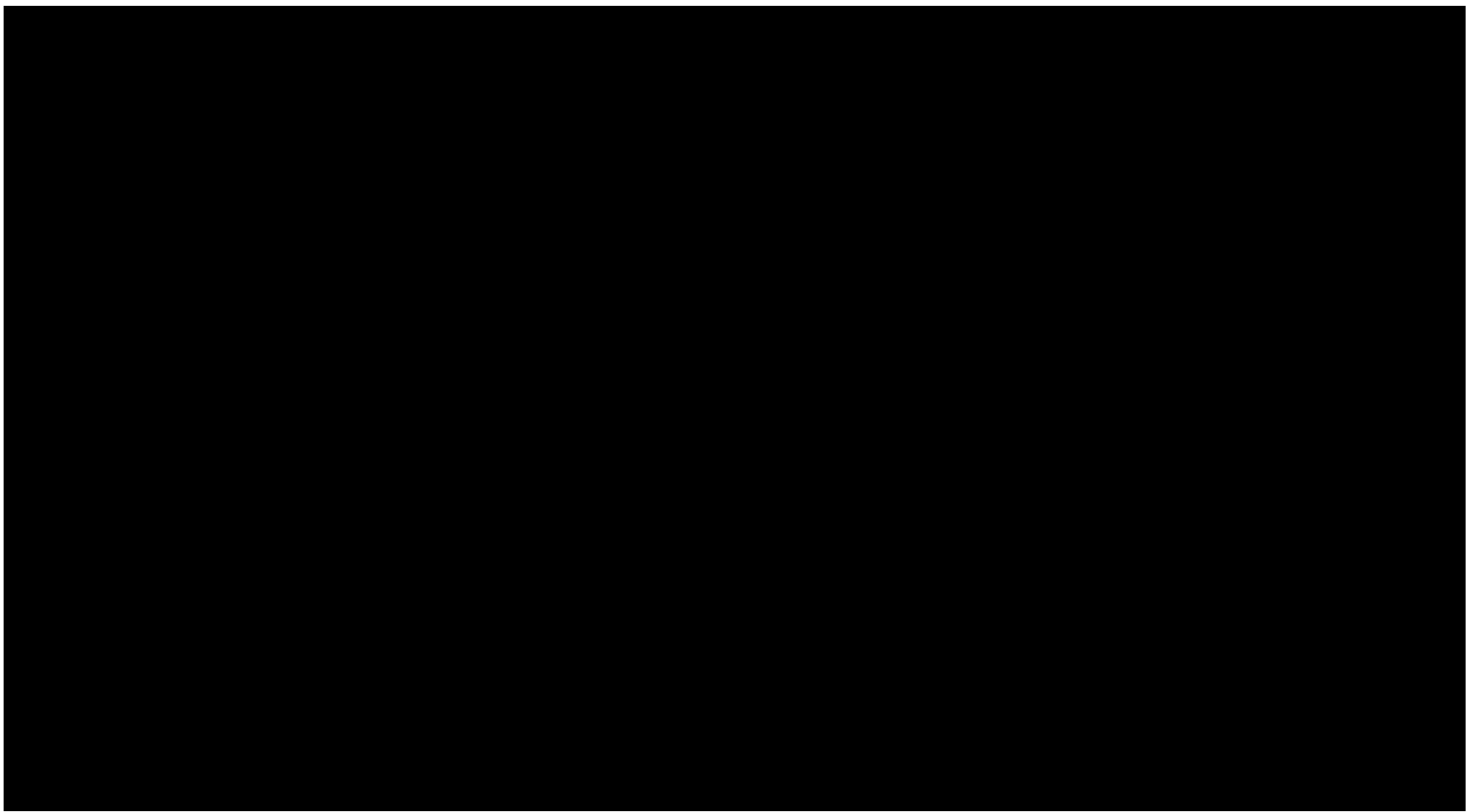
- **Minor complications** → pain during injection, chemosis, conjunctival hemorrhage & leakage of local anaesthetic
- **Major complications** → orbital & retrobulbar hemorrhage, rectus muscle paresis & trauma, globe perforation, central spread of local anesthetic, orbital cellulites etc
- Most of these complications occurs following use of 2.54- cm metal cannula.
Kumar CM et al - Eur J Anaesthesiol 2005;22:567-77.
- Smaller or flexible cannulae appear to be safer but the incidence of minor complications increases.
Kumar CM & Dodds C et al - An Br J Anaesth 2001;87:631.

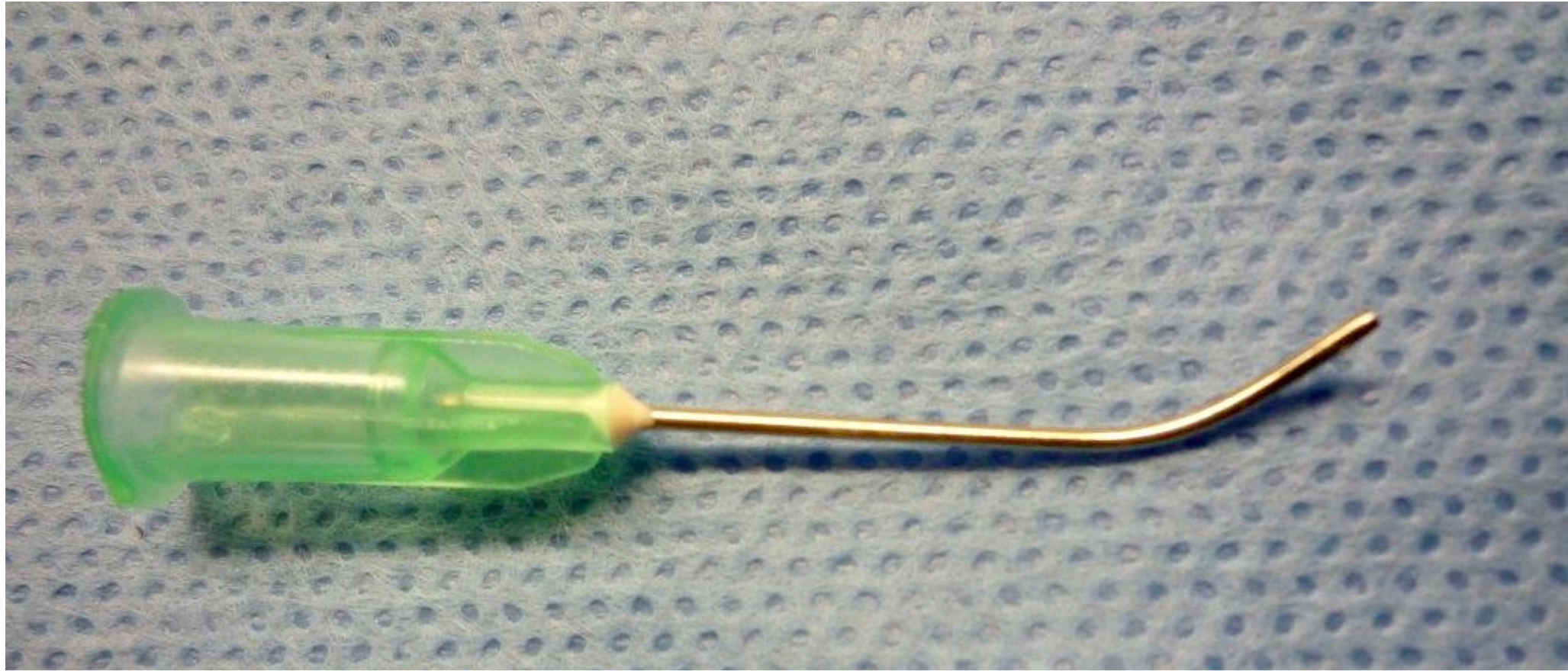


Sub- Tenon's block

■ Standard technique

- ❑ Obtaining surface anaesthesia
 - ❑ Access to the sub-Tenon's space
 - ❑ Insertion of a cannula
 - ❑ Administration of local anaesthetic agent
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- 





Triport Cannula



Conjunctival
Probe

Incision-Free Sub-Tenon Anesthesia

Eye
<https://doi.org/10.1038/s41433-020-01207-0>

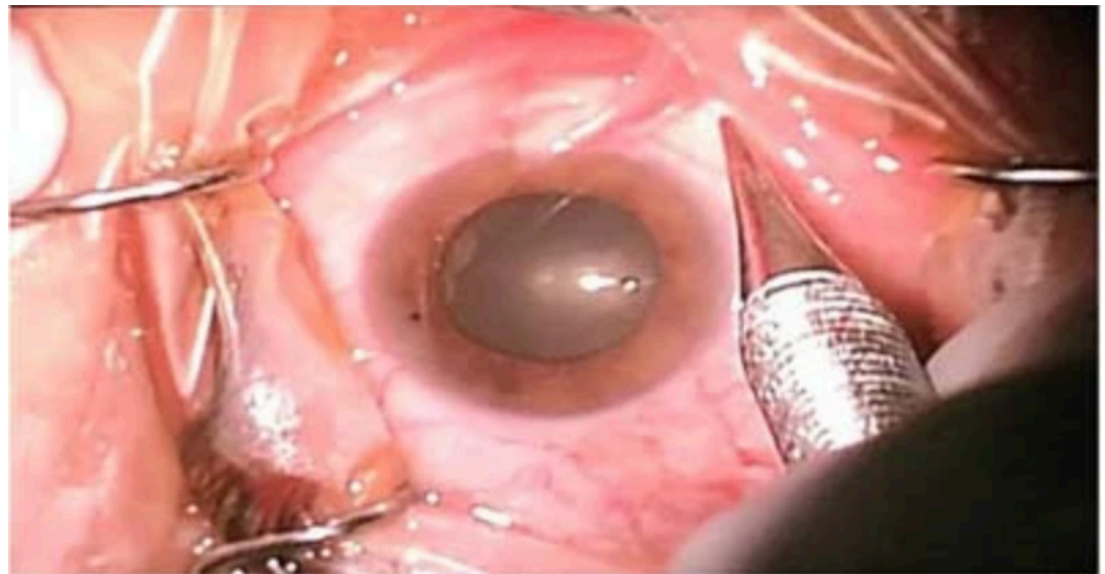
 The ROYAL COLLEGE of
OPHTHALMOLOGISTS

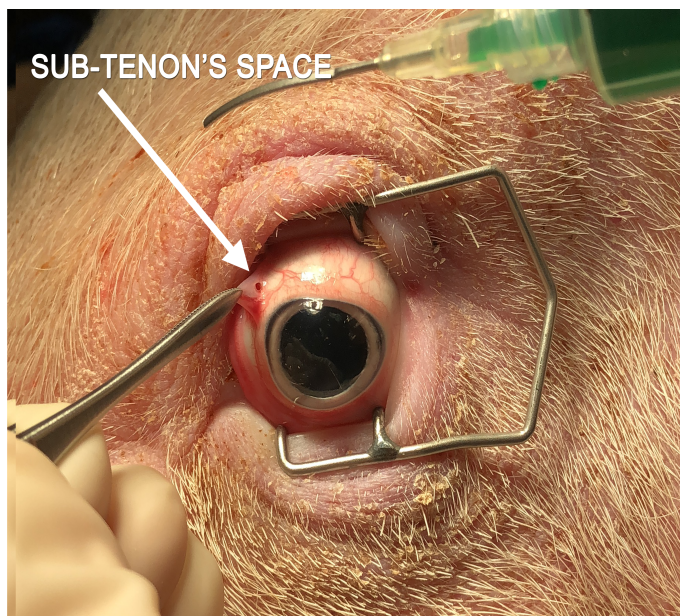
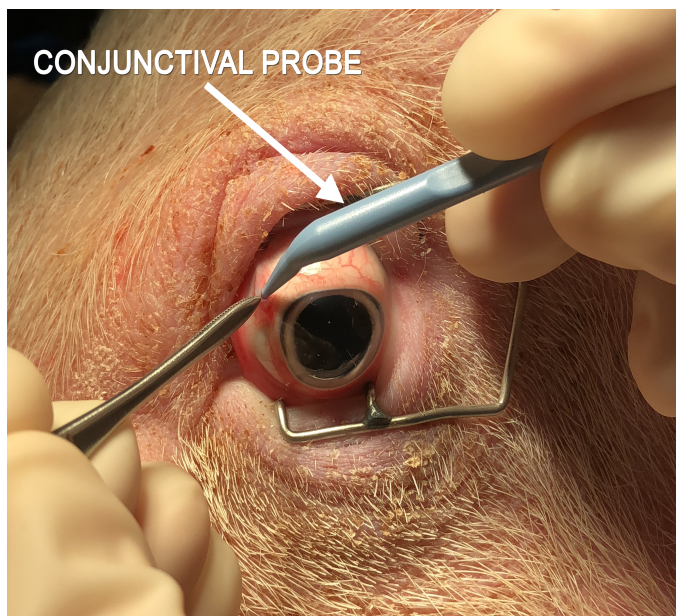
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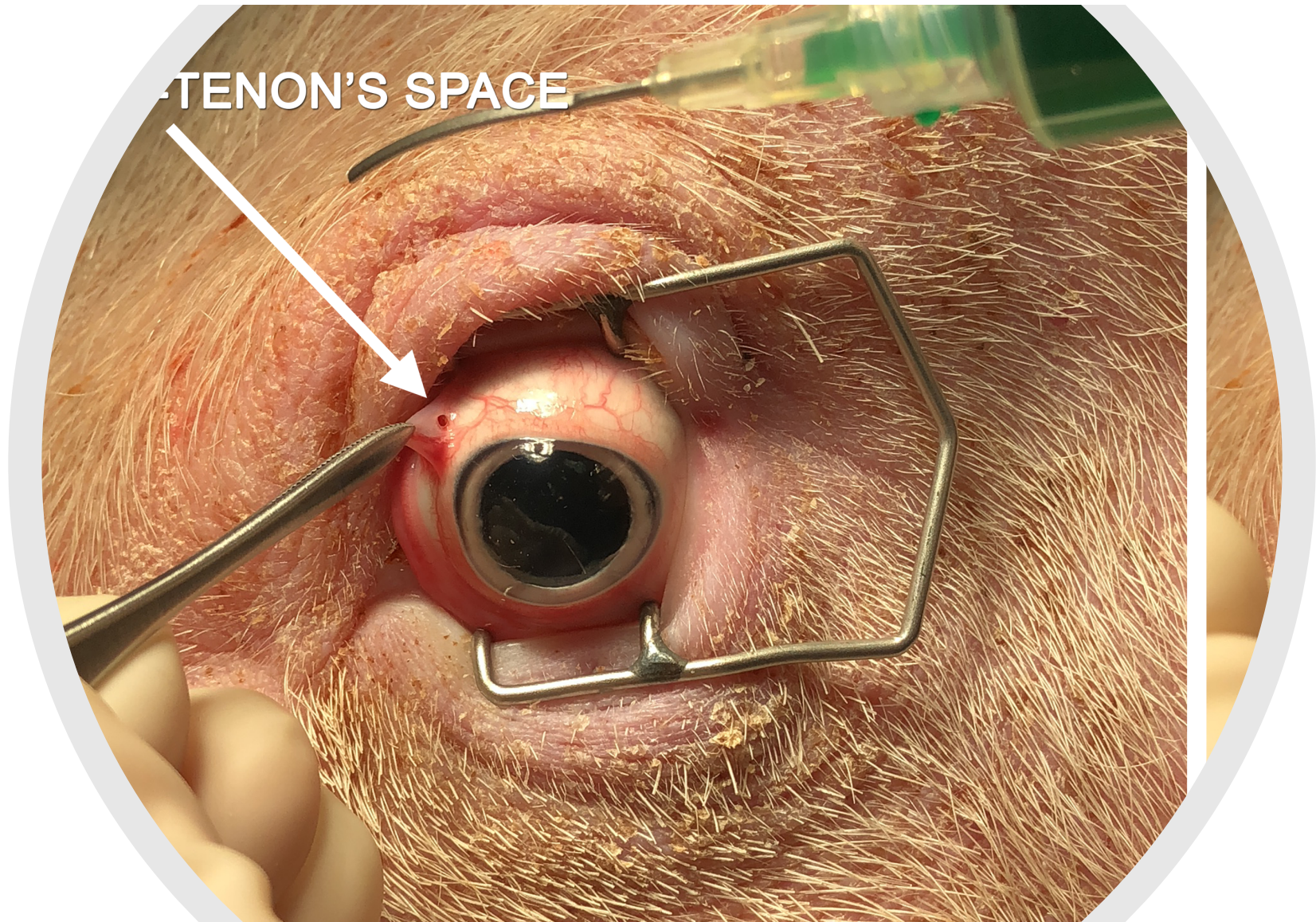
Lacrimal dilator-facilitated incisionless vs. standard sub-Tenon's block: a randomized, prospective and non-inferiority comparative study

Muge Coban-Karatas¹ · Oya Yalcin Cok² · Chandra M. Kumar¹ ³





TENON'S SPACE



Incision-Free Sub-Tenon Anesthesia

Howard Palte, MD