

Innervation of the Inferior Oblique Muscle: Anatomical Facts

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We read the published article entitled “An anatomical study of the inferior oblique muscle with emphasis on its nerve entry” by Kumar et al.⁽¹⁾ This study described the entry of the inferior division of the oculomotor nerve to the inferior oblique muscle and the topographical anatomy of the muscle. We would like to take this opportunity to share some important scientific facts. We agree with the authors that the course of the inferior division of the oculomotor nerve and anatomical location of the muscle are important in ophthalmological surgery and regional anesthesia. According to a standard anatomy textbook, the oculomotor nerve is the third cranial nerve and is entirely motor.⁽²⁾ It divides into superior and inferior divisions at the lateral wall of the cavernous sinus. The superior division of the oculomotor nerve innervates the superior rectus and levator palpebrae superioris while the inferior division divides into three branches i.e. the medial, central and lateral.⁽²⁾ The medial branch passes deep into the optic nerve to enter the ocular surface of the medial rectus, the central branch traverses a course downwards and forwards to enter the ocular surface of the inferior rectus, while the lateral branch takes a course forward on the lateral side of the inferior rectus to enter the orbital surface of the inferior oblique.⁽²⁾ Interestingly, the authors did not describe the precise branching of the inferior division of the oculomotor nerve involved in the present study. Obviously, the precise branch must be indicated because the three branches traverse three different courses.

According to earlier research, any variations

with regard to the topographical anatomy of the inferior oblique muscle may lead to a high incidence of recurrence or persistence of inferior oblique overaction.⁽³⁾ Double bellies in the inferior oblique muscle at the capture site and multiple bellies at its insertion site are important variations that need to be carefully examined at the time of surgery to avoid complications.⁽⁴⁾

The authors mentioned that the anaesthesia procedure also requires a more precise understanding of the anatomy of the inferior oblique muscle. This is because the inferior oblique muscle may be injured during the anesthesia procedure. One case report showed inferior oblique muscle tightness and fibrosis following local anaesthesia.⁽⁵⁾ The above-mentioned case patient also presented with typical ipsilateral superior oblique palsy.⁽⁵⁾ A particular part of the extraocular muscle may be retracted only after having prior anatomical knowledge of the innervation pattern.

The entry of the two divisions of the oculomotor nerve traversing the superior orbital fissure has been well documented in cadaveric specimens.⁽⁶⁾ It is also very important to know if the inferior division of the oculomotor nerve innervates the ciliary ganglion or not. In the present study, it would have been interesting to know if the inferior division supplied the ciliary ganglion.

The study opens the door for future research in setting up a normal data bank on extraocular muscles in different areas of the world. An earlier study reported on extraocular measurements in the Chinese population.⁽⁷⁾

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Overall, an interesting article for which the authors and editor especially, should be applauded.

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