Case report

Shearing of the Globe by Needle Tip following peribulbar block

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Abstract

Inadvertent globe damage during retrobulbar or peribulbar block administration has been reported in the literature. Here, we are reporting shearing of the globe leading to a retinal scar like hypopigmented lesion without any retinal detachment or vitreous hemorrhage. Also, the probable various causes, management and preventive steps to be followed are discussed.

Keywords

Regional ophthalmic anaesthesia, globe perforation, local anaesthesia, peribulbar complications, eye surgery

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Introduction

Perforation or penetration of the globe by iatrogenic needle tip injury during administration of needle block has been reported in the literature. Perforation of the globe with a needle has both wound of entry and exit, whereas penetration of the globe has only entry wound. The reported incidence of an accidental globe perforation after retrobulbar or peribulbar block is around 0.006% to 0.13%.[1–5] We report a case of accidental shearing of the globe by a needle tip during peribulbar block administration and discusses the probable causes, management and prevention of such complication.

Case report

Fifty-five year old gentleman with no history of any systemic illness complained of diminution of vision in both the eyes, left eye more than the right eye. On examination, left eye was diagnosed with full thickness macular hole.

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Vitrectomy with internal limiting membrane peeling and Intravitreal gas injection was planned under regional anaesthesia. His left eye had normal intraocular pressure with normal axial length. Routine preoperative examination, laboratory investigations including blood sugar and electrocardiogram were within normal limits. Written informed consent for performing the surgery under regional anaesthesia was obtained. Intravenous line was established and electrocardiogram, pulse oximeter and non-invasive blood pressure monitor were connected. Preoperative vitals were within normal limits. Local anaesthetic solution was prepared using 0.75% Ropivacaine (Ropizuva, Abbott Healthcare Pvt Ltd.) and injection hyaluronidase (Hynidase) around 15 IU/ml. Twenty three gauge 1 inch steel needle with long bevel and sharp tip was used for peribulbar injection. With the eye in the primary gaze position, at the extreme inferolateral quadrant, around six ml of local anaesthetic solution was injected. Intermittent digital massage of the globe was done for two minutes. As the globe akinesia was not attained, a supplementary injection at the medial peribulbar space was administered using 26 gauge half inch needle. Around four ml of local anaesthetic solution was injected. After two minutes of intermittent digital massage of globe, complete akinesia and analgesia was attained. After instilling 5% povidone iodine drops, surgery was started.

The vitreous was found to be clear and the retina was attached. In the inferotemporal quadrant a linear, hypopigmented mark was seen in the midperiphery. This hypopigmented mark was not present during the preoperative evaluation. This was a fresh mark thought to be due to the needle grazing the outer wall of the eyeball during the peribulbar block. There was no retinal tear or bleeding or hypotony. The surgical steps of posterior vitreous detachment induction, vitrectomy, and internal limiting membrane peeling could be performed without any difficulty. Sulfur-hexafluoride gas tamponade was given for the closure of the macular hole. In addition, the probable needle injury site was treated with barrage laser to prevent future retinal break or detachment (Video 1). The surgical duration was one hour. The patient tolerated the procedure well with no complaints of pain or discomfort during surgery and postoperatively.

VIDEO

Discussion

On review of literature, previous authors have reported globe perforation or penetration while performing regional anaesthesia. The present case is an unique case of shearing of the globe resulting in a scar like lesion in the retina without any breaks which was treated timely with laser treatment.

The most probable cause that can be hypothesized in this case is that, needle tip would have been pointed towards the orbital apex and it would have just sheared the globe near the equator where the trajectory path of the needle is supposed to be in close proximity to the globe. While performing inferolateral injection, neither abnormal resistance was felt by anaesthesiologist nor atypical pain was felt by the patient.

Though in our case only a small scar like lesion appeared which was timely managed, if the needle tip was angulated too much then it would have resulted in more serious adverse events like perforation or penetration of the globe with vitreous haemorrhage and/or detachment of the retina. Table 1 highlights the various causes involved in shearing of the globe by a needle and the preventive steps to be adopted in each to prevent such adverse event from happening.

Table 1: Various probable causes and the preventive steps to prevent shearing of the globe due to needle tip during peribulbar block

S.N.	Various causes for shearing globe by a needle during peribulbar block	Preventive steps to be followed
1.	Tip of the needle facing the globe while performing the inferolateral peribulbar injection	Bevel of the needle should face the globe
2.	Eye not fixed in primary gaze position	Eye should always be fixed in primary gaze position
3.	Needle tip pointing towards the orbital apex	Needle tip should be pointed away from the orbital apex
4.	Abnormal globe:orbit spatial relationship like deep set eyes and forward set globe	i.Needle should not be angulated or inclined more than 100 from the floor. Trajectory needle path should be parallel to the orbital floor. ii.Needle length inserted need not be more than 2.5 cm inside the orbit.
5.	Enophthalmos	Better to perform such cases under sub-tenon's block and avoid needle block.
6.	History of buckle surgery done earlier	It is Important to elicit this history during preoperative evaluation. Due to probable alteration in the globe dimension due to buckling, peribulbar needle to be inserted more carefully
7.	High mypoes, patients with inferolateral or posterior staphylomas	Better to perform only single medial peribulbar block with half an inch needle
8.	Inadvertent head movement by the patient during injection	During preoperative evaluation, explain clearly in their native language about procedure involved in needle block and hazards involved in moving the head during administration of regional anaesthesia

S.N.	Various causes for shearing globe by a needle during peribulbar block	Preventive steps to be followed
9.	Inadequate digital massage of the globe following the primary injection	i.Supplementary injection should not be performed immediately following the primary injection at the inferolateral quadrant. ii.Adequate digital massage of the globe minimum for a period of two minutes ensures that the globe had attained near normotensive before the supplementary injection is performed
10.	Regional anaesthesia performed by the trainees	In depth thorough knowledge of the anatomy and spatial relationship of the globe:orbit is important before practicing regional ophthalmic anaesthesia

Conclusion

This case highlighted the importance of angulation and depth of needle that can be inserted safely during peribulbar block. As needle blocks are generally a blind procedure; in-spite of all the above preventive measures adopted, occasional sight or life threatening complication owing to iatrogenic globe or vessel damage can occur. Much safer regional anaesthesia can be attained with sub-tenon's block with blunt tipped cannula and an semi-blind approach.

Conflicts of interest

There are no conflicts of interest.

References

1. Eke T, Thompson JR. Serious complications of local anaesthesia for cataract surgery: a 1 year national survey in the United Kingdom. Br J Ophthalmol. 2007;91:470–5.
2. Lee RM, Thompson JR, Eke T. Severe adverse events associated with local anaesthesia in cataract surgery: 1 year national survey of practice and complications in the UK. Br J Ophthalmol. 2016;100:772–6.
3. Rosenthal G, Bartz-Schmidt KU, Engels B, et al. Primary use of silicone oil tamponade in the management of perforating globe injury secondary to inadvertent local anaesthesia injection for ophthalmic surgery. Int Ophthalmol. 21:1997–1998. 349–52.
4. Edge R, Navon S. Scleral perforation during retrobulbar and peribulbar anesthesia: risk factors and outcome in 50,000 consecutive injections. J Cataract Refract Surg. 1999;25:1237–44.
5. Kimble JA, Morris RE, Witherspoon CD, Feist RM. Globe perforation from peribulbar injection. Arch Ophthalmol. 1987;105:749.