

Peribulbar block - Pros Vs Cons: A debate

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Introduction

Regional anaesthesia in cataract surgery ranges from akinetic blocks involving a needle^{1,2} to non-akinetic topical anaesthesia techniques.³ Following the introduction of foldable intraocular lens and with lesser surgical manipulation, subtenon block (STB) and topical anaesthesia were found to be sufficient for performing cataract surgery. In countries like United States and United Kingdom, surveys have reported a decline in the use of retrobulbar and peribulbar block (PBB), with STB and topical techniques gaining popularity.^{4,5} On the other hand, in a recent cross-sectional survey done among the Ophthalmology trainees in a tertiary ophthalmic centre in India, it was found that nearly 92% preferred sharp needle blocks over STB or topical anaesthesia for performing cataract surgery.⁶

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Article History

Received: 4th April 2021

Revision: 29th April 2021

Accepted: 10th June 2021

Published: 30th June 2021

STB was introduced into the clinical practice as a simple, safe, and effective technique because of continuing concerns over the rare but serious complications like globe perforation associated with sharp needle blocks. A few observational studies involving large number of patients report a low rate of serious ocular and systemic complications with STB.^{7,8} There was only one instance of a non-sight threatening subconjunctival haemorrhage in a retrospective study of 6,000 patients who underwent STB.⁸ However, there have been several case reports of severe ocular and systemic complications with STB.⁹⁻¹⁶ To date, no randomized controlled trial has been published to prove that STB has less risk of serious complication than traditional needle blocks.¹⁷

In the opinion of first author, who have been practicing needle blocks for over two decades, following are the factors which favors PBB.

Pros

- i) PBB avoids the need for dissection of conjunctiva and breaching the anatomical integrity of the eyeball layers.
- ii) PBB is easy to administer and does not require the use of forceps or scissors.

How to cite this article: Peribulbar blocks – Pros Vs Cons: A debate. Jaichandran V V, Keith Allman. *Ind J Ophthal Anaesth* 2021;1(2):38-44

- iii) Patient's cooperation is not a major pre-requisite. Hence, in patients requiring sedation, PBB is better.
- iv) PBB is easier to administer in patients who have sunken eyes (deep socket, deep seated eye) or those who cannot lie completely flat for any reason.
- v) PBB can be done without any prior instillation of local anaesthetic drops into the eye.
- vi) PBB is preferable in patients with a previous 'band' or scleral buckle, glaucoma drainage devices, and lesions of conjunctiva such as pterygium.
- vii) PBB has a very low incidence of chemosis and subconjunctival haemorrhage. Hence, the eye does not appear bruised after the block. For e.g., cataract surgery involves a 3 mm incision. PBB maintains the appearance of the eye.
- viii) Use of single medial injection PBB virtually eliminates the risk of globe perforation in myopic patients as almost all staphylomas are lateral or posterior.
- ix) PBB is safe even in patients on anticoagulation and multiple studies have shown that the incidence of bleeding is either not increased or is not of clinical significance.
- x) PBB is cost effective as it obviates the need for forceps and scissors.

One dreaded complication of a sharp needle block is globe perforation (GP) and ideally should never happen. Its incidence is much lower in PBB when compared to retrobulbar blocks.

The incidence of GP due to PBB is not negligible and was about 1 in 4500 in the last UK survey conducted in 2012-13.⁷ However, this can be reduced significantly if not eliminated with better training, use of simulators, and possibly by increased use of single medial injection PBB. To date, there have been no reports of GP with single medial injection PBB.¹⁸ To develop and improve their skills in administering needle blocks, modules such as Ophthalmic Anaesthesia Simulation System (OASiS)¹⁹ and real time view mannequin²⁰ can be considered. Ultrasound guided blocks are likely to increase in future and may improve safety.

An important question for me "Is the risk of a GP sufficient not to have a PBB"? I do not think so. To put it in perspective, the risk of death after coronary catheterization is quoted as 0.02%²¹. The risk of stroke after coronary catheterization ranges from 0.08% - 0.38%²². Even if I take the lowest risk of stroke, combining it with mortality figures gives a risk of 0.05% of a major complication i.e. 1 in 2000. That is still more than double the risk of GP. Considering the advantages of PBB and the relatively low risk, I do not mind having a PBB. Like any other patient, I will pray that the person performing is reasonably trained.

“Peribulbar block - Cons”

Introduction

In any debate one must take sides - often more ardently than is practicable in real life. The following represents second author's own experience of ophthalmic anaesthetic blocks. It is based upon UK practice generally. These do not necessarily represent the opinions of BOAS as a whole and are in no way intended to cause offence to anyone especially my esteemed colleague and good friend, who is on the other side of this debate. Like many other UK ophthalmic centres, until about 15 years ago, most of our routine work was undertaken using peribulbar block (PBB) – considered (correctly) a significant improvement in safety over the much too prevalent retro-bulbar block. An inadvertent globe perforation (GP) caused us to rethink our unit policy. The case was particularly poignant as it involved a trainee anaesthetist who was psychologically traumatised, and a professional gentleman recently retired to take up his hobby of water-colour painting. In discussion with our surgical colleagues, we re-examined the available evidence for all options of ophthalmic anaesthesia, and within a matter of weeks had largely dropped all sharp needle blocks in favour of subtenon block (STB). They have never been missed!

Cons

PBB is an extremely easy and effective anaesthetic technique (there – I have said it). Most anaesthetists who have done it for several years never experience a serious complication. Unfortunately, this 'micro' view is somewhat limiting and if one 'steps back' and takes a wider national view, a rather different story becomes apparent. Tom Eke et al. have done exactly that – three times. Using data obtained through the British Ophthalmological Surveillance Unit at the Royal College of Ophthalmologists, London, they undertook incidence studies of complications relating to ophthalmic anaesthesia. Through each time period examined, the rate of GP related to PBB was remarkably consistent at around 2/10,000.^{23,24,25} This figure is conservative as the studies relied on a degree of self-reporting. It is low enough for individual anaesthetists performing normal numbers of blocks to rarely see a sight threatening complication, but large enough to have significant detrimental effects on a population scale. In the UK more than 300,000 cataract operations are performed annually, and if all these were undertaken using PBB then we would expect at least 60 GP each year. The USA performs more than 3,000,000 cataracts annually and this would equate to 600 GP a year. GP as a complication of PBB is usually not recognised immediately and is often catastrophic for vision.

And this is not the most common complication of sharp needle blocks. Serious sight threatening retrobulbar haemorrhage occurs with a similar incidence to GP, and direct muscle damage from sharp needles, which will often result in debilitating diplopia requiring lens or surgical correction, occurs with a conservatively estimated rate of 0.25% (25/10,000).²⁶

Is PBB safe in my hands and much cheaper?

There is no doubt that with experience the incidence of GP with PBB can be reduced. Roy Hamilton (undoubtedly a leading world expert on PBB) is apocryphally said to have performed 40,000 blocks before experiencing a GP. Unfortunately, not all practitioners are so lucky nor so experienced. Teaching other anaesthetists or trainees the technique will inevitably cause an increased incidence, and the presence of several unknowns (staphyloma, distorted anatomy) means that sharp needle techniques always contain an element of "Russian Roulette".

The argument that PBB is cheaper than, for example, STB is also fallacious. A case of inadvertent GP recently settled out-of-court for £100,000 plus costs (personal communication). Assuming an incidence of 2/10,000; this means that every PBB undertaken in the UK is likely to be costing the NHS at least £20 in subsequent medico-legal costs. The opinions of the legal team involved in this case are salutary.

The crux of the case revolved not around the Bolam principle, but on whether proper informed consent had been taken.

It was felt that as sight loss is a well-recognised complication of PBB, informed consent should include a realistic discussion of these risks together with an appraisal of the use of other potentially safer methods of achieving anaesthesia (STB, general anaesthesia, infiltration etc). This is a difficult discussion to undertake possibly twenty times per day – not to mention time consuming.

What is wrong with STB?

Many of those anaesthetists steadfastly adhering to sharp needle techniques will argue that STB is difficult to learn, does not give akinesia and causes unacceptable amounts of low-grade morbidity (chemosis and sub-conjunctival haemorrhage). They often also state that their surgeons 'don't like it'. The first point is true – STB is much harder to learn and teach than PBB. The other points, however, are not. With experience and a good technique, STB will give reliable, full akinesia with little or no haemorrhage (particularly if using an "incisionless technique").²⁷ A small degree of chemosis is almost inevitable but can be reduced to acceptable levels. It should also be remembered that many PBB also cause significant chemosis. Surgical opinion is difficult, and I believe it is important that if changes to ophthalmic anaesthetic technique are to be made, it is best to do this in conjunction with surgical colleagues. In our institution, once the risk / benefit discussion had been clearly presented, our ophthalmologists were absolutely in favour

of a change that would clearly and directly benefit patients. Since changing to using exclusively STB anaesthesia almost fifteen years ago, we have never been asked to perform PBB, and we have never felt the need to.

Conclusion

Perhaps the most important part of any technique is not the equipment or method used per se, but the person behind the cannula or needle. Our speciality is no longer simple – expectations from both surgeons and patients have increased dramatically in the past twenty years. Surgical techniques have become ever more challenging, in a patient population of advancing years. Perhaps the most important change should be that we have anaesthetists who are interested in, and competent at, all available methods of ophthalmic anaesthesia: anaesthetists who work regularly in eye theatres for more than one session a week and those who have the experience of day-to-day running of an eye unit. Then, perhaps, I might, just possibly, entertain the merest idea, of letting someone near my eye with a sharp needle.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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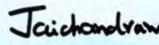


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IJOA Indian Journal of Ophthalmic Anaesthesia
Volume 1 Issue 2 Jun 2021

Next IJOA issue will be released on-line on Jan 2022.

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