Prolonged peribulbar anaesthesia with indwelling catheter: a preliminary report of 217 cases†

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Summary
We report a technique to prolong peribulbar anaesthesia by repetitive injections of lignocaine through a catheter in the inferotemporal peribulbar space during surgery anticipated to exceed 60 min. After peribulbar anaesthesia by standard percutaneous approach with the eye looking straight, a 19-gauge Tuohy needle was inserted backwards in the sagittal plane and parallel to the 5° slope of the orbit floor, to a distance of less than 3 cm, at the junction of the middle and lateral third of the lower orbital rim. A 23-gauge smooth catheter was advanced up to the tip of the needle which was withdrawn, keeping less than 3 cm of catheter in the inferotemporal compartment. A catheter was inserted in 217 consecutive patients undergoing vitrectomy, retinal detachment and retinal peeling. There were no technical difficulties. Neither additional sedation nor general anaesthesia was required during surgery, but less than 50% of patients requested lignocaine injections to supplement anaesthesia. Catheter insertion into the peribulbar space may represent a potential technique to perform a greater variety of ophthalmic surgery with regional anaesthesia. Indications should be limited to the longest procedures. (Br. J. Anaesth. 1997; 78: 81–82)

Key word

Retrobulbar block has been used widely for various types of ophthalmic surgery; it consists of injection of a small volume of local anaesthetic into the extraocular muscle cone to anaesthetize the ciliary ganglion and nerves innervating the rectus muscles. However, as this technique involves blind insertion of a needle into a space occupied by delicate neural and vascular structures, complications can occur. With peribulbar injection, a larger volume of anaesthetic is injected with no attempt to enter the muscle cone which, at least theoretically, is less dangerous. With time, the anaesthetic agent diffuses and adequate anaesthesia is obtained. However, peribulbar block may be inadequate for prolonged procedures, such as posterior segment surgery. We describe a technique to prolong peribulbar anaesthesia by repetitive injections through a catheter in the inferotemporal peribulbar space.

Methods and results
After local Institutional Human Investigation Committee review, we studied 217 consecutive ASA I–III patients undergoing ophthalmic surgery which was anticipated to exceed 60 min. During the preoperative visit, this aspect of anaesthetic management was explained and informed consent was obtained. Patients with impaired haemostasis or receiving oral anticoagulants and those with previous ipsilateral eye surgery were excluded. No premedication was given.

Peribulbar anaesthesia was produced initially by a standard percutaneous approach with the eye looking straight. Using a 27-gauge, 31-mm disposable retrobulbar needle, 5–8 ml of a 0.5% bupivacaine and 2% lignocaine mixture in equal proportion were injected into the inferotemporal compartment, followed 2 min later by a second injection for medial compartment peribulbar block. A bolus of propofol 0.5–1 mg kg\(^{-1}\) i.v. was given to lessen the discomfort and awareness of the injection. Peribulbar block and consequently a peribulbar catheter technique should also be achievable after local anaesthesia of the inferotemporal conjunctival fornix, avoiding the need for propofol and preserving the advantages of local anaesthesia in very old and fragile patients. Continuous decompression using a Honan balloon at a setting of 30 mm Hg was applied while patients recovered from propofol sedation.

Patients were asked to move their eyes, using maximal effort in the superior, inferior, medial and lateral directions. If globe akinesia was incomplete, a supplementary injection was given. When akinesia was complete, a 19-gauge Tuohy needle (Paediatric Extradural Set System 2, Rüsch Laboratory) was inserted under sterile conditions. The needle entry...
than 3 cm of catheter in the peribulbar space. In con-
of the needle which was withdrawn, keeping less
catheter was introduced and advanced up to the tip
the cone and into the globe. A 23-gauge smooth
Tuohy needle, reducing the risk of penetration into
probably pushed tissue and the eye away from the
orbital rim (fig. 1). The initial peribulbar block
upward slope of the orbit floor, less than 3 cm from
backwards in the sagittal plane, parallel to the 5
knowledge, the needle tip passed transcutaneous,
of the inferior orbital rim. Based on anatomical
point was the junction of the middle and lateral third
of the inferior orbital rim (broken line).

Continuous decompression was then performed
until surgery started. The catheter was taped to the
cheek with plaster. During surgery, patients received
a 5-ml bolus of 2% lignocaine via the catheter at
each complaint of pain. After negative test aspira-
tion, each injection was made slowly, over 2 min, to
avoid significant increased pressure in the operating
field. Injection was discontinued if the surgeon
requested it, to be completed later. During the entire
procedure, we monitored continuously heart rate
and pulse oxygen saturation. Arterial pressure was
measured by automated sphygmomanometry. After
leaving the operating theatre, patients were asked to
evaluate the quality of anaesthesia using a five-point
scale.

Mean age and weight of the patients were 64
(range 16–89) yr and 66 (SD 13) kg, respectively.
Time of decompression was 32 (SD 11) min. A
catheter was used for prolonging anaesthesia in 92
patients, most often for one injection (58 cases).
Three patients required up to four injections of
lignocaine, thus receiving a maximum dose of 560
mg, including the initial block. The time for the first
request from the initial peribulbar block was 52 (15)
min, with wide inter-individual variability (range
25–95 min). Surgery included 28 cases of vitrectomy
(duration 43 (range 15–80) min), 121 cases of
retinal detachment (duration 56 (10–120) min) and
68 cases of retinal peeling (duration 33 (15–60)
min). Use of the catheter was, respectively, 54%,
52% and 20%.

Comment

Verbal contact was maintained in all patients. Neither additional sedation nor general anaesthesia
was required. Intraoperative injection of lignocaine
5 ml was compatible with continuation of surgery and
did not inconvenience the surgeon. With the excep-
tion of one patient who declared that the operation
was unpleasant, there were no bad or medium responses when we asked patients to evaluate anaes-
thesia. No local complications were observed, except
two cases of lower eyelid haematoma which resolved
spontaneously. No symptoms of local anaesthetic
toxicity were observed. One episode of reflex brady-
cardia (heart rate less than 40 beat min\(^{-1}\)) was
observed in a 40-yr-old patient who had received
three injections of lignocaine for inadequate analge-
sia. With the exception of this case, there were no
changes in heart rate, arterial pressure or pulse
oxygen saturation during surgery.

We conclude that catheter insertion into the
peribulbar space is an easy and reliable method of
performing a greater variety of ophthalmic surgery
with regional anaesthesia.

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