471828 - THE EFFECT OF AORTIC INFRARENAL CLAMPING AND UNCLAMPING ON INTRAOCULAR PRESSURE DURING ELECTIVE ABDOMINAL AORTIC ANEURYSM REPAIR

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Introduction: The significance of this study will be to answer a clinical question that has not already been investigated; that is, what are the effects of aortic infrarenal clamping and unclamping on intraocular pressure during abdominal aortic aneurysm (AAA) repair? Studies have been published assessing intraocular changes with prone positioning, laparoscopic surgery and cardiopulmonary bypass (1,2,3). However, there has been no literature evaluating intraocular pressure during AAA repair. Based on the results, this study may raise or alleviate concern that vascular surgery for abdominal aortic aneurysm could contribute to early perioperative exacerbation of pre-existing eye disease and increase a patient's vulnerability to developing ischemic optic neuropathy.

Methods: After Biomedical Research Ethics Board Approval, the study enrolled ten patients to detect changes in intraocular pressure during various stages of aortic infrarenal cross clamping and unclamping. Intraocular pressure measurements and arterial blood gas analysis were made at eight events: a) awake supine b) after induction of anesthesia, supine, mechanically ventilated pre-incision c) under anesthesia, supine, mechanically ventilated, one minute post-aortic cross clamping d) under anesthesia, supine, mechanically ventilated, five minutes post aortic cross clamping e) under anesthesia, supine, mechanically ventilated, one minute pre-unclamping f) under anesthesia, supine, mechanically ventilated, one minute post unclamping g) under anesthesia, supine, mechanically ventilated, five minutes post unclamping h) under anesthesia, supine, skin closure. The variables measured at each event included intraocular pressure (IOP), mean arterial pressure (MAP), heart rate (HR), partial pressure of arterial oxygen (PaO₂), partial pressure of arterial carbon dioxide (PaCO₂), pH, oxygen saturation (O₂sat), peak inspiratory pressure (PiP), end tidal concentration of anesthetic, hematocrit (Hct.), hemoglobin (Hgb), and cumulative fluid balance. Dichotomous variables such as use of vasoactive agents and mannitol were recorded. Duration of cross clamping was measured. The Tono-pen XL® hand held tonometer (Innovamed), an instrument validated in prior studies, was used to measure IOP in this study. Patients were excluded if they had a history of acute or chronic eye disease and allergy to topical ophthalmologic anesthesia. Patients receiving nitrous oxide, ketamine or succinylcholine as part of their anesthetic were also excluded.

Results: All measured variables were analyzed with repeated measure analysis of variance. A *a posteriori* analysis determined that the study was powered to detect IOP pressure as low as 3 mm Hg. There was no significant change in IOP during any of the event intervals between pre-incision post induction and skin closure for both eyes (Mean IOP 16.9 mm Hg +/- 2.6 S.D. and 16.7 mm Hg +/-2.7 S.D. for (R) and (L) eyes respectively).

Discussion: For patients undergoing elective infrarenal abdominal aortic aneurysm

repair, we do not expect a change in intraocular pressure during the course of the surgery. As a result, exacerbation of pre-existing eye disease and risk of ischemic optic neuropathy related to high intraocular pressure is unlikely.

References: 1. Anesthesiology 2001;95:1351-5. 2. Gynaecological Endoscopy 2002;11:383-87. 3. British Journal of Ophthalmology 1987;71:177-80.