Oculocardiac reflex in an anophthalmic eye

Sir,

Oculocardiac reflex (OCR) is one of the most notorious complications associated with ophthalmic surgeries. We would like to report a case where OCR developed in an anophthalmic socket.

A 15-year-old, 30 kg girl, was posted for removal of an orbital implant. She was a treated case of retinoblastoma. During her first surgery at 4.5 years of age, a 5 mm resection of the optic nerve stump was performed and an implant had been inserted. The four recti muscles were disinserted from the globe and had no attachment to the implant. On follow-up, she developed a contracted socket with implant exposure and was taken up for implant removal.

After attaching standard monitors, she was administered 30 µg of IV fentanyl and general anaesthesia was induced with 70 mg of IV propofol. The trachea was intubated and anaesthesia maintained with sevoflurane in oxygen and nitrous oxide (FIO₂-0.4) at a MAC of 1. Ten minutes after the start of the procedure, when the surgeon was dissecting the conjunctiva from the anterior surface of the implant [Figure 1], her heart rate abruptly slowed from 86 bpm to 54 bpm. The surgical team was immediately informed and they stopped manipulation, which led to the restoration of heart rate. This episode recurred when the surgeon attempted to release the implant from the integrated subconjunctival tenon’s tissue. They again stopped manipulation and normal sinus rhythm was restored. Since it was suspected that the bradycardia seemed secondary to OCR, 15 µg of fentanyl was administered and the anaesthetic depth was increased. The implant was explanted and haemostasis was achieved [Figure 2]. Residual neuromuscular blockade was reversed and the trachea was extubated.

OCR in an empty globe has been hypothesised to occur due to the regeneration of the axons of the ciliary nerves from the Gasserian nucleus leading to the establishment of the afferent limb of the reflex.[1] There have been two reported cases of OCR secondary to debridement of the empty orbit and its curettage.[1,2] In our case, the surgeon was dissecting the adherent conjunctiva and tenon’s fascia from the implant which are supplied by the branches of the ophthalmic division of the trigeminal nerve. The initial dose of fentanyl administered was 1 mcg/kg as removal of an exposed implant was
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Deemed to be only mildly painful with minimal dissection. It is unlikely that any of the anaesthetic agents led to the bradycardia as the patient was stable for 20 min post-induction and developed transient bradycardia on manipulation only. While we did not use an objective measure for depth of anaesthesia as it is not a part of routine practice for non-strabismus surgeries, it has been suggested that BIS monitoring may help decrease incidence of OCR by confirming adequate depth. Prophylactic premedication with atropine has been debated over time for OCR prevention. Although it has been associated with a reduction in OCR incidence, the potential for dysrhythmias caused by atropine itself may prove more difficult to manage. We did not opt for treatment with atropine as the bradycardia terminated on stopping of manipulation and was not associated with hypotension or sustained effects. We chose to deepen the plane of anaesthesia by increasing the MAC and giving additional analgesia. It is worthwhile mentioning that fast-acting opioids like fentanyl and sufentanil have been associated with an increase in bradycardia and hence should be used judiciously.

Though, in our case, the bradycardia was self-resolving and did not cause haemodynamic instability, it may lead to serious consequences in patients with poor cardiac reserve. An enucleated orbit should not lull the anaesthesiologist into a false sense of complacency and an OCR should be suspected in case of sudden bradycardia.

Declaration of parental consent

The authors certify that they have obtained all appropriate consent forms. In the form the Parent’s has/have given his/her/their consent for his/her/their child’s images and other clinical information to be reported in the journal. The parents understand that their child’s names and initials will not be published and due efforts will be made to conceal their child’s identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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Figure 1: Diagrammatic representation of the enucleated socket with the exposed anterior surface of the implant, adherent conjunctiva on the implant surface and all 4 recti muscles in their respective fornices

Figure 2: Empty socket at the end of surgery
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Distorted supraclavicular brachial plexus anatomy due to cervical rib with a knuckle—Usefulness of ultrasound in planning a regional anaesthesia strategy

Ultrasound-guided supraclavicular block (SCB) was planned for fixation of forearm fracture in an otherwise healthy 40-year-old male patient. The patient was an active manual labourer and did not have any symptoms suggestive of neurological or vascular compromise of the upper limb. On scanning the supraclavicular fossa, the classic bunch of grapes posterolateral to the subclavian artery (SCA) could not be identified [Figure 1a]. The ultrasound probe was slid cephalad and 2 cm above the clavicle, the bunch of grapes was identified lateral to the SCA [Figure 2]. Here, sliding sign of pleura was seen posteromedial to the SCA and a bony structure was seen lateral to it. To clearly delineate the anatomy, the brachial plexus (BP) was scanned systematically from the level of the roots. C5, C6 and C7 roots were identified based on the anatomical features of their respective transverse process (TP). Formation of upper, middle and lower trunks did not show any anatomical variation. Transverse cervical and dorsal scapular arteries were identified between the middle and lower trunks [Online Video 1]. The neural elements were however seen to curve laterally over a bony structure and finally came to lie lateral to it in the supraclavicular area. Colour Doppler was used to confirm that the structures seen were not vascular structures. A bony hard structure with parallel margins corresponding to that of a rib could be appreciated on palpation of the supraclavicular fossa [Figure 2 inset (b)]. On scanning of the right side of neck, the bunch of grapes could be identified in the usual position posterolateral to the SCA [Figure 1b]. The patient was informed that the supraclavicular anatomy was not clear and performing an axillary brachial plexus block was an alternative. Axillary brachial plexus scan showed a normal anatomy. Hence, an axillary brachial plexus block was performed.

A chest-X-ray was taken post-operatively. Radiological opinion was sought and bilateral cervical ribs was diagnosed. Chest-X-ray also showed pseudoarthrosis of the cervical ribs with the first rib, presence of an additional knuckle and a more laterally displaced cervical rib on the left side [Figure 3] with widening of left apical area of chest cage.

Depending on whether cervical rib is rudimentary, complete or incomplete, the BP anatomy also varies. Liu and Peng have reported a wide separation of the lower trunk from the rest of the plexus by a cervical rib,[1] while the plexus was identified as a single cluster by Watanabe et al.[2] In the present patient, the plexus was seen as a single bunch initially medial to the cervical rib and then lateral to it in the supraclavicular fossa.

The diagnosis of cervical rib in this patient was made post-operatively. Intra-operatively, SCB was deferred as the neural elements appeared to curve around a bony structure and performance of a block at a point where the nerves are prone to be mechanically stretched can result in neurological injury. Although uneventful SCB have been performed in patients with diagnosed cervical rib, we personally...