Management of a temporomandibular joint synovial cyst in a case complicated by severe trigeminocardiac reflex

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ABSTRACT

The trigeminocardiac reflex is a rare occurrence in patients undergoing maxillofacial surgery, with a reported incidence of 1–2%. Clinical signs and symptoms include bradycardia, nausea, with further stimulation potentially leading to cardiac dysrhythmias, ectopic beats, atrioventricular blocks and asystole. Most maxillofacial procedures, including temporomandibular joint procedures, are considered low risk. We report the first case of a tender temporomandibular joint synovial cyst whose management was complicated by severe trigeminocardiac reflex resulting in asystole. We suggest that in such cases communication between surgeons and the anaesthesia team is of paramount importance and informing the anaesthetist intraoperatively prior to the manipulation of the capsule or temporomandibular joint meniscus is recommended in the prevention or successful treatment of this condition.

KEYWORDS

TMJ – Synovial cyst – Trigeminocardiac reflex – Temporomandibular joint

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Introduction

Trigeminocardiac reflex was first described as the oculocardiac reflex in 1908 and was attributed to pressure-induced cardiac reflex that caused cardiac depression through the stimulation of the vagal nerve. Today it is described as a sudden decrease in heart rate of more than 20% of the baseline values, dysrhythmias or sinoatrial arrest.¹ We present a case of a tender cyst in the temporomandibular joint, whose treatment was complicated by severe trigeminocardiac reflex, and its subsequent management.

Case history

A 56-year-old woman with no significant medical history presented with a tender bony lump on the left zygomatic arch. Magnetic resonance imaging revealed a 1-cm ganglion cyst related to the left temporomandibular joint (Figs 1 and 2). On examination, the lump appeared to be fixed, increasing in size and painful. A plan was devised for open exploration of the left temporomandibular joint with cyst excision. Attempted cyst excision under general anaesthesia resulted in asystole on manipulation of the cyst. The heart rate immediately returned to normal with release of the tissue and administration of 300 micrograms of atropine intravenously. The procedure was aborted and incisional biopsy, which had already been taken, showed it to be a simple synovial cyst.

Management options were discussed at the head and neck multidisciplinary team meeting, together with a

consultant colleague who undertook temporomandibular joint surgeries and a decision was taken to monitor the cyst. This was complicated, however, by significant pain and a new onset of recurrent locking of the temporomandibular joint. As a result of this, the patient underwent eminectomy, with the aim of creating space for the meniscus and the cyst, and to facilitate free movement of the meniscus. This did not result in alleviation of the symptoms and so high condylectomy was planned following further discussion at the head and neck multidisciplinary team meeting. High condylectomy was the next best option, as meniscectomy including removal of synovial cyst was not deemed possible owing to the aforementioned complication at initial surgery.

The patient was pre-emptively administered 200 micrograms glycopyrrolate intravenously at the time of meniscal manipulation and since this did not result in bradycardia, meniscectomy and cyst excision were carried out with interpositional abdominal fat graft insertion and high condylectomy was abandoned, as this was a more aggressive treatment option with attendant risks such as a discrepancy in the occlusion. The patient had a significant reduction in pain following surgery and no longer experienced locking of the temporomandibular joint.

Discussion

Trigeminocardiac reflex is a rare occurrence in patients undergoing maxillofacial surgery, with a reported incidence

Figure 1 Magnetic resonance image: coronal view

Figure 2 Magnetic resonance image: axial view

of 1–2%.² The trigeminocardiac reflex is activated when sensory branches of the trigeminal nerve are mechanically stimulated by pressure, stretching, or movement.³ This sets off an arc in which vagal stimulation leads to a cardiac depressor response.³ Most cases are associated with a 10–50% reduction in heart rate, which returns to normal upon cessation of the stimulus.¹ Clinical signs and symptoms include bradycardia, nausea, faintness with further stimulation potentially leading to cardiac dysrhythmias, ectopic beats, atrioventricular blocks and asystole.⁴

Predisposing risk factors include cardiac disease, hypoxaemia, hypercapnia, as well as children.² Lubbers *et al.* have suggested a surgical stratification of risk factors wherein most maxillofacial procedures, including temporomandibular joint procedures, are considered low risk.²

Following recognition of the onset of reflex bradycardia, avoidance of predisposing factors, halting the surgical stimulus, intravenous administration of atropine or glycopyrrolate and anaesthesia of the afferent nerves are the suggested treatment options.^{1,4} In our case, all of the above were done, with the exception of anaesthesia of the afferent nerve, which was not necessary as the asystole resolved with the other measures. We suggest communication between surgeons and the anaesthesia team is of paramount importance and informing the anaesthetist intraoperatively prior to the manipulation of the capsule or temporomandibular joint meniscus is recommended in the prevention or successful treatment of this condition. With temporomandibular joint surgery being considered a low-risk surgery for the development of trigeminocardiac reflex, and with an incidence as low as 1–2%, it can be argued that routine administration of pre-emptive anticholinergic drugs may not be advisable and hence was not undertaken in our case at the initial surgery.

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