

Dexmedetomidine: Sedation for Awake Craniotomy

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Introduction

During awake craniotomy, the challenge for the anaesthetist is to provide adequate sedation & analgesia for the stimulating parts of the procedure whilst retaining the ability to rapidly awaken the patient for co-operation with neurophysiological testing and cortical mapping; all the time maintaining cardiorespiratory stability.

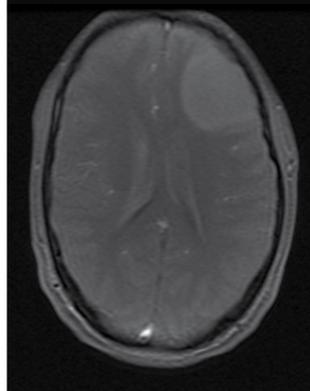
Dexmedetomidine has recently been launched in the UK, and we describe its first use at our institution for sedation during awake craniotomy.

Case Report

A 33 year old gentleman was listed for a resection of a 4cm low grade primary glioma in his left frontal lobe. He had presented a few weeks earlier with a single tonic clonic seizure. His past medical history was otherwise unremarkable.

His case had been discussed at the neuro-oncology multi disciplinary meeting, and it was decided that an awake craniotomy would provide the best clinical outcome.

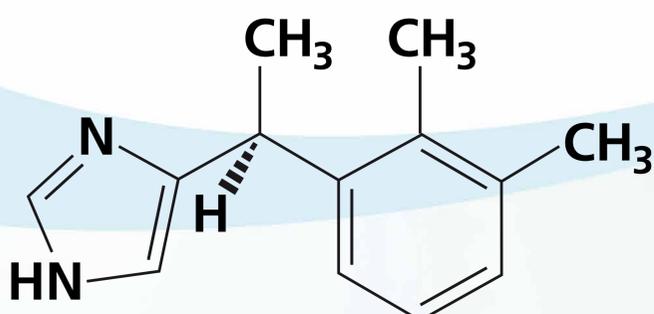
MRI HEAD:
well defined non-enhancing mass within the left temporal lobe.



Anaesthetic Technique

- No premedication
- Monitoring: pulse oximetry, electrocardiogram, non-invasive blood pressure end tidal CO₂.
- 16G Cannula
- Loading dose 0.75 mcg/kg dexmedetomidine was administered over 30 minutes
- During this time a unilateral scalp block was inserted using 20 millilitres of 0.5% levobupivacaine

Dexmedetomidine molecule



He was then positioned in the in the right lateral position and his head was secured with a Mayfield clamp; additional local anaesthetic was administered to the pin sites prior to its application. The patient was subsequently transferred into theatre.

The loading dose was followed by a maintenance dose initially of 0.2 mcg/kg/hr increasing to 0.7mcg/kg/hr at times of maximal stimulation (skin incision, bone flap removal & dissection of dura).

A mild decrease in heart rate and blood pressure was observed by 10-15 bpm and 10 mmHg respectively. There was no change in his respiratory parameters.

During tumour resection, the infusion rate was dropped to 0.2-0.4 mcg/kg/hr and the patient was easily arousable. He was fully able to co-operate with speech testing and cortical mapping, and tumour adjacent eloquent cortex was carefully removed. Sedation was again deepened to facilitate closure.

The procedure was well tolerated by the patient who remained calm and comfortable. He did not require any intraoperative opiate analgesia and was given intravenous paracetamol towards the end of the procedure.

Discussion

Dexmedetomidine is a highly selective 2-agonist which has a sympatholytic effect through decrease of the release of noradrenaline from sympathetic nerve endings. The sedative effects are mediated by decreased firing of the locus coeruleus, the predominant noradrenergic nucleus situated in the brainstem.

As well as inducing reversible sedation during which the patient can easily be aroused, this novel drug also has anxiolytic and analgesic properties, and importantly does not depress respiration.

These characteristics greatly favour its use in the setting of awake craniotomy, and our initial experience has been positive.

References

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