

## PROLONGED MYOCLONIC CONTRACTIONS AFTER ENFLURANE ANAESTHESIA – A CASE REPORT

ANTHONY T.H. NG

### ABSTRACT

A healthy young woman underwent arthroscopy of the right knee, for which she was given an enflurane anaesthetic. The anaesthetic was uneventful, but she started to show myoclonic jerky movements involving multiple muscle groups, except those innervated by the cranial nerves, while recovering from the anaesthetic. These jerky movements settled to the left side of her body. It was also associated with significant right frontal and retro-orbital headache. Serial neurological assessments were entirely negative. These symptoms took more than 48 hours to disappear. She recovered from this anaesthetic complication completely. An anaesthetic complication of this nature and duration has not been reported before in association with enflurane.

ENFLURANE ANAESTHESIA is known to produce central nervous system excitation manifested by a change of electroencephalographic activity. This shows high voltage, fast frequency, progressing through spike-dome complexes alternating with periods of electrical silence to frank seizure activity.<sup>1</sup> The latter may or may not be associated with clonic contractions of various muscle groups. This phenomenon is more likely to be seen during deep or prolonged enflurane anaesthesia. It also occurs in patients who have a history of epileptic seizures. Twitching is transient and self-limiting. This report describes the case of a patient with no past history of epilepsy who had one hour of uneventful enflurane anaesthesia, who then developed prolonged jerky myoclonic movements for 48 hours after the anaesthetic.

### CASE REPORT

A 38-year-old female patient was admitted to the short-stay surgical unit of a community hospital for arthroscopy of her injured right knee, for which she had had several weeks of conservative treatment. Her past medical history consisted of several abdominal and pelvic operations under uneventful halothane anaesthesia. She gave no history of previous convulsive disorders of any kind. Preanaesthetic assessment put her in A.S.A. physical status, I. Being an outpatient she was given no preanaesthetic sedation. General anaesthesia was started with gallamine 20 mg, sodium thiopentone 375 mg and succinylcholine 100 mg for induction and tracheal intubation.

Anthony T.H. Ng, M.B., B.S., F.R.C.P.(C), Staff Anaesthetist, York Central Hospital, Richmond Hill, Ontario.

Anaesthesia was maintained with a sequence of nitrous oxide 66 per cent, oxygen 33 per cent and enflurane 1–1.5 per cent. Induction was smooth and vital signs remained stable. Blood pressure averaged 110/70 mm Hg and pulse 90 per minute, being regular throughout. She was allowed to breathe spontaneously. The arthroscopy lasted about 45 minutes. It is calculated that she was exposed to 1.5 per cent enflurane for about 60 minutes. No movements of any type were observed during the whole anaesthetic. Arthroscopy findings were negative.

on her left side when she attempted to get out of recovery room asleep, breathing well and with good colour. She woke up about 15 minutes afterwards, complained of feeling cold and was shivering all over. She was given a blanket to keep her warm. About 30 minutes after conclusion of the anaesthetic, she complained of severe earache and headache, and also felt nauseated. When the shivering had settled down, about 35 minutes later, the recovery room nurse noted that she had involuntary jerky movements involving intermittently different groups of muscles. The attending surgeon and anaesthetist-on-duty were notified. When the movements continued two and one-half hours postanaesthetic, the advice of an internist was sought. He examined her, including a detailed neurological examination, and found no localizing signs apart from the myoclonic jerky movements involving multiple muscle groups. Sometimes all four limbs were simultaneously involved. The movements were moderate intensity jerks which were not sustained. Muscles innervated by the cranial nerves were spared. At this time her headache settled into the right frontal and retro-orbital areas. It was obvious then that she required admission to hospital

for observation overnight for these symptoms. Admission diagnosis was "postenflurane myoclonic jerks for observation". Electro-encephalography was unfortunately not done, as this service was not readily available on an emergency basis.

The patient stayed for a total of 48 hours before she was sent home. During this time she had intermittent jerky movements, initially involving various muscle groups but later limited to the left side. She also complained of very mild weakness on her left side when she attempted to get out of bed the next morning. Because of these complaints, the same internist was requested to repeat his neurological examination, which was found to be entirely normal. No left-sided weakness was demonstrable. She was discharged home and followed up by the internist for another neurological assessment.

When she was seen about three weeks later she related that she continued to have mild intermittent jerks for another few days. She had also vomited several times. The follow-up neurological examination was reported to be negative. Liver function tests were done which indicated mild derangement of liver functions, quite frequently noted in patients exposed to halogenated inhalational anaesthetics.

#### DISCUSSION

Myoclonic movements after enflurane anaesthesia, though reported in the literatures and quoted in the "warning section" of the enflurane

prescribing information package, are not commonly seen in everyday anaesthetic practice. Anaesthetists in our hospital must have been giving about 2,500–3,000 enflurane anaesthetics per year and this is the first case of a myoclonic episode associated with the agent. It is even rarer to observe this phenomenon continuing for 48 hours into the postanaesthetic period. A search of the current anaesthesia literature concerning neurological complications from this anaesthetic failed to find a report. It seems obvious from clinical observation that these jerky movements must be associated with the central nervous system excitation, though we have no electroencephalographic evidence to confirm this. A possible latent neurological lesion, uncovered by the central nervous system excitation effect of enflurane was also considered, but was not proven by repeated neurological examinations. It was decided that further investigation of an invasive type was not justified. She recovered completely within one month. She was subsequently advised not to be exposed to this type of anaesthetic again. It is not possible to predict whether the same complication would occur again, nor can we be certain that these events were specific to enflurane.

#### REFERENCE

1. NEIGH, J.L., GARMAN, J.K. & HARP, J.R. The electroencephalographic pattern during anaesthesia with ethrane: effect of depth of anaesthesia,  $P_{aCO_2}$  and nitrous oxide. *Anesthesiology* 35: 482–487 (1971).

#### RÉSUMÉ

Une jeune femme de bonne santé a subi une arthroscopie du genou droit sous anesthésie à l'enflurane. L'anesthésie s'est déroulée normalement jusqu'au moment où à la période de réveil, elle s'est mise à exhiber des secousses musculaires saccadées intéressants plusieurs groupes musculaires à l'exception des groupes innervés par les nerfs crâniens. Ces mouvements se sont finalement limités au côté gauche et furent associés à des céphalées rétroorbitaires et fossiles droits. Des évaluations neurologiques en série ont été négatives. Les symptômes mentionnés sont disparus après quarante-huit heures et la récupération a été totale. Il s'agit de la première complication anesthésique d'une telle nature et d'une telle durée qui soit rapportée avec l'utilisation de l'enflurane.