## Short Communication

# One Year Experience of MRI under General Anaesthesia

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## Abstarct

A case series over one year of our experience of using Propofol and Laryngeal mask airway (LMA) in children under 10 years of age undergoing MRI under general anaesthesia is presented. All paediatric patients under the age of ten attending out-patient department were included in the case series starting from January 1st, 2004 till December 31st, 2004. All patients underwent general anaesthesia using Propofol / LMA technique as described in detail in communication below. A total of 78 children were included; the only patient requiring intubation was the youngest: a neonate of 1 day who had a large orbital mass. Propofol in the dose of 2 mg/kg and an appropriate size LMA according to weight of the patient was used. Majority of the patients (67) had a brain or head MRI for 'developmental delay', 5 patients had a brain MRI for a 'mass lesion' and 5 patients had a lumbo-sacral MRI for 'abnormal growth'. There was only one complication when a child with history of seizures, seized on recovery and had to be subsequently admitted to the Emergency Room for observation. No other morbidity or mortality was noted. All patients were outpatients. We can conclude based on our results that providing GA for paediatric patients undergoing MRI with Propofol and LMA can be safe and effective in outpatient radiology.

## Introduction

Mentally retarded children or adult patients with different indications can be scheduled for MRI investigations under general anaesthesia (GA). Compared to X-ray techniques, the advantage of MRI diagnostics is that it can differentiate other tissues in the human body than X-ray. MRI is practically a non-invasive method.[1] Hence, there are only a few indications to perform MRI in general anaesthesia. The reasons include uncontrollable restlessness, severe mental retardation, psychological (fear) and psychotic syndromes that would else result into poor

quality images.[2] Many of these indications apply to small children who cannot stay still in the MRI machine. Safety and risk of complications in providing anaesthesia in remote areas are issues that arise in these cases.[3,4] In very small children, general anaesthesia is preferred in many cases, particularly in children with severe mental retardation.[5,6] Although benzodiazepines may be used for sedation, there might still be some residual effect after two hours, and that may prevent their use. We present a case series over one year of our experience of using Propofol and Laryngeal mask airway (LMA) in children under 10 years of age undergoing MRI under GA.

Propofol (trade name of Diprivan®) is a short acting hypnotic in emulsion form that is being used more and more frequently in outpatient surgery.[7] Its special quality is that it has a short 'onset of action' and half life (t ½) and therefore is ideal for use in patients who have to be sent home on the same day. It also has a reduced incidence of nausea and vomiting, both of which are known complications of general anaesthesia[8] and can prolong recovery time. Providing GA in the remote MRI suite presents special problems, including unavailability of help (being away from other anaeasthesia personnel, inaccessibility of MRI compatible equipment including monitoring equipment, and inability to use larygoscopy in the MRI suite. All 'ferromagnetic' equipment needs to be left outside[9]; hence, intubation, in order to secure the airway cannot be possible in cases of emergencies.

## Methods and Results

All Paediatric patients attending outpatient department under the age of ten were included in the case series starting from January 1st, 2004 till Decemebr 31st, 2004. All patients underwent general anaesthesia using Propofol / LMA technique (except for one) as described in detail below. Our MRI suite, staffed by a consultant and an anaesthesia technician, includes an MRI compatible Anaesthesia machine, a Mapleson A breathing circuit, an Isoflurane vapourizer, a pulseoximeter , ECG monitor and a Dynamap blood pressure recorder. Oxygen supply is also provided from a wall connection. We routinely establish an IV cannula outside the MRI room and the child is then taken inside the MRI room where, after attaching monitors, an intravenous (IV) induction is carried out using Propofol at 2mg/kg (recommended dose). An appropriate size (based on weight) LMA is then placed in the apneic patient. Anaesthesia is then maintained on 100% oxygen and 1.5% isoflurane with spontaneous ventilation. Cases are routinely done of 1-2 hours including brain and cervical MRIs without any problem of patient movement. Monitoring is continued throughout. At the end of the procedure, the isoflurane is discontinued and the LMA is removed, with a deep plane of anaesthesia or the patient awake; however, in either case, the breathing of the patient is spontaneous.

A total of 78 patients underwent the procedure with the youngest patient being 1 day old requiring an MRI for a large orbital mass. This patient was also the only exception to the LMA practice and was intubated for a definitive airway.

Majority of the patients (67) had a brain or head MRI for 'developmental delay', 5 patients had a brain MRI for a 'mass lesion' and 5 patients had a lumbo-sacral MRI for 'abnormal growth'.

There was only one complication when a child with history of seizures who was having a brain MRI for investigation, seized on recovery and had to be subsequently admitted to the Emergency Room (ER) for observation. No other morbidity or mortality was noted.

## Conclusion

We can conclude with our results that providing GA for paediatric patients undergoing MRI with Propofol and LMA is safe and effective in outpatient radiology. Over 10 year-old-children can often comply with instructions to remain still. However, children with learning difficulties or claustrophobia often need deeper level of sedation. Therefore, general anaesthesia is often indicated to increase safety, improve quality of imaging, increase the comfort of patients and for the improvement of logistics of the MRI suite. Sedation is an option only in healthy patients who can tolerate diagnostic procedures. Propofol, with its short half life and quick onset seems a good choice. All our patients were able to go home the same day. One patient required observation for treatment of suspected seizures, however was also successfully sent home subsequently. There were no other reported side effects.

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