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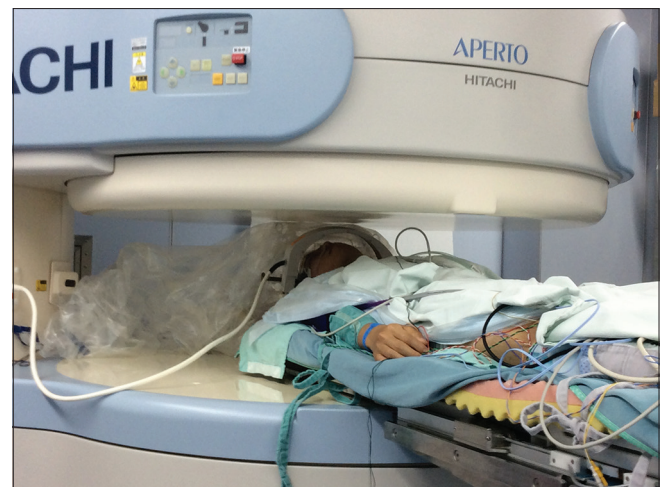
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## Concerns while monitoring patients during awake craniotomy with intraoperative magnetic resonance imaging

Sir,

Gandhe and Bhavé suggested some important considerations for awake craniotomy under intraoperative magnetic resonance imaging (iMRI).<sup>[1]</sup> We would like to add that capnography, the concomitant monitoring of end-tidal carbon dioxide (EtCO<sub>2</sub>) and respiratory rate (RR), is essential because direct visualisation of chest movement and immediate access to the patient's airway are restricted when an awake patient is in the iMRI gantry.<sup>[2]</sup> While pulse oximetry is useful for monitoring oxygenation, desaturation lags significantly behind hypoventilation, especially when patients receive supplemental oxygen. Moreover, neurosurgical intervention may decrease the level of consciousness, which sometimes causes respiratory deterioration.<sup>[3]</sup> A review of 356 consecutive awake craniotomies at our institution revealed poor recording of the intraoperative respiratory condition of unsecured airway patients: RR was monitored in only 30.2% of all iMRI sequences (through changes in EtCO<sub>2</sub> level), whereas oxygen saturation was recorded in 95.9% of cases.<sup>[2]</sup> While the use of capnography for non-intubated patients is still uncommon, an absolute change from baseline of greater than 10 mmHg or loss of EtCO<sub>2</sub> waveform may indicate that the patient is at risk of significant respiratory depression.<sup>[4]</sup> All the respiratory arrests among our patients were detected based on gradually decreasing RR by capnography.<sup>[2]</sup> Careful patient observation is also important; our unwrapped draping technique enhances patient visibility [Figure 1]. Compared with high magnetic field iMRI scanners, low magnetic fields with a gap at the side of the scanner may reduce the frequency of transfer-related accidents and enable a quick response to a patient's declining status.



**Figure 1:** Intraoperative magnetic resonance imaging scan for the awake patient. An unwrapped draping technique in an open intraoperative magnetic resonance imaging scanner with a low field strength provides enough space for effective patient observation during scanning

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#### Conflicts of interest

There are no conflicts of interest.

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