

Intraoperative considerations for emergency caesarean for the parturient with an acutely decompensated glioblastoma – a case report

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CASE REPORT

A 36-year-old presented at 30/40 gestation with acute onset headache, vomiting, expressive dysphasia and right-sided localising neurological symptoms. Computed tomography (CT) and magnetic resonance imaging (MRI) of the head demonstrated a large left-sided lesion with significant oedema and mass effect. Repeat imaging after a deterioration in consciousness demonstrated worsening mass effect (Fig 1A & 1B). She simultaneously went into spontaneous labour with cardiotocograph changes indicating foetal compromise. The multidisciplinary team (MDT) decision was to proceed to emergency caesarean section and decompressive craniectomy in neurosurgical theatres. The hyperdynamic circulation in pregnancy posed a neurosurgical risk and care was taken to avoid fluctuations in blood pressure during induction, delivery, uterotonic administration and patient positioning. Invasive blood pressure monitoring was established prior to modified rapid sequence induction with propofol, remifentanyl and rocuronium to avoid raised intracranial pressure. Both surgeries were completed successfully. The patient was extubated in intensive care before undergoing elective tumour resection and discharged home for ongoing care. Her follow-up imaging from 1 day, 1 week and 1 month post-decompression can be seen in Fig 1C, 1D and 1E respectively, and her post-resection imaging is shown in Fig 1F.

KEY ISSUES

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| → Intracerebral mass expansion and deteriorating GCS | → Threatened pre-term labour |
| → Haemodynamics for neuroanaesthesia | → Intraoperative risk to placental perfusion pressure |
| → Morbidity and mortality | → Hormone-mediated expansion of tumour? |
| → Post-op ventilatory period | → Uterotonic administration |
| → Patient positioning immediately post partum | → Alternative plausible diagnoses of pregnancy e.g. PET |

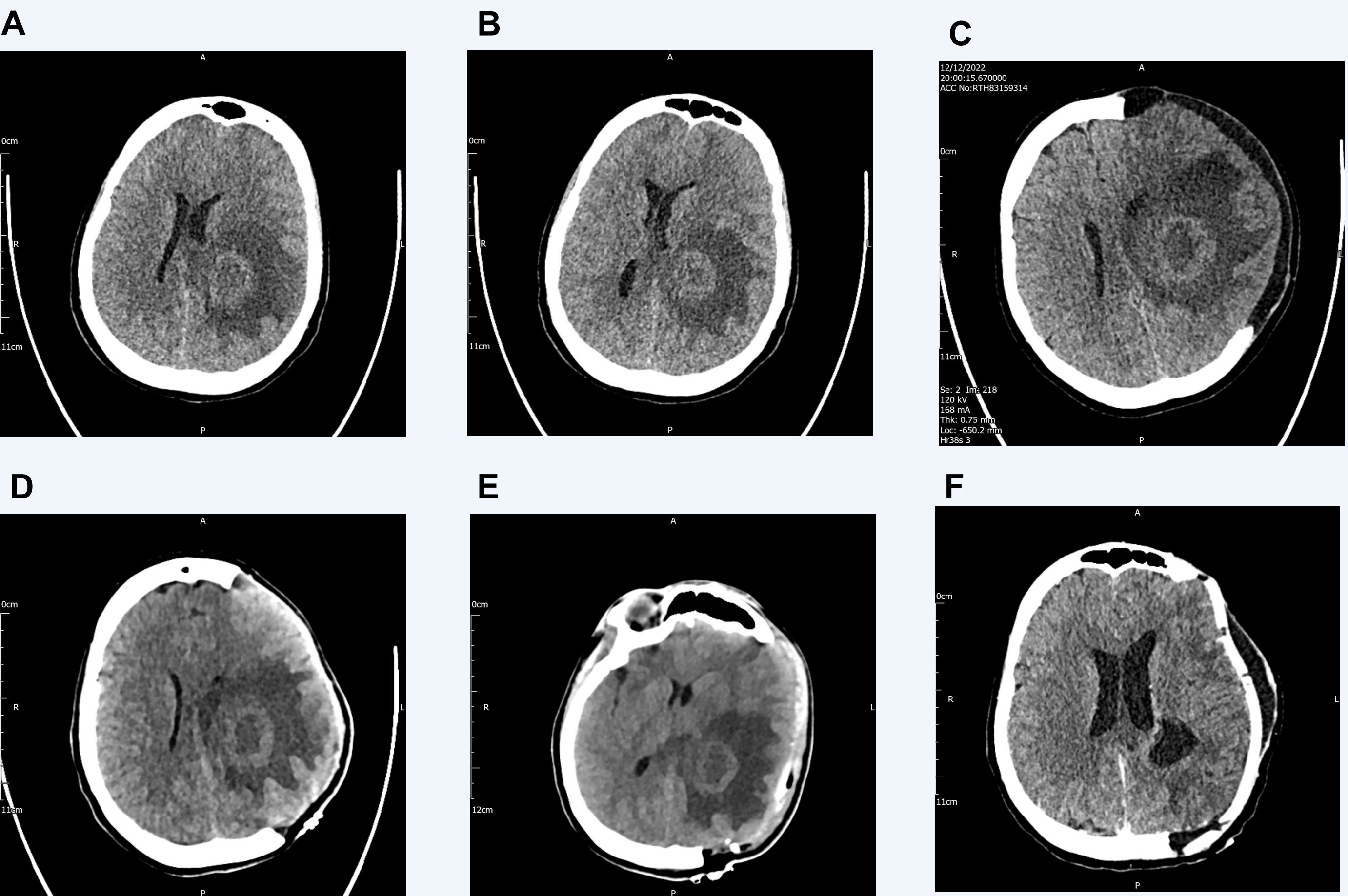


Figure 1 A-F: CT images of the parturient's intracerebral lesion. Initial presentation can be demonstrated in [A]. Repeat imaging following deterioration can be seen in [B]. Images [C], [D] and [E] demonstrate post operative imaging at days 1, 7 and 1 month respectively. Image [F] demonstrates some resolution in ventricle size following surgical resection 3 months later.

Team

- Consultant presence from surgical and anaesthetic team
- Senior scrub staff for both obstetric and neurosurgical teams
- Senior midwifery and neonatal teams
- Clear team leader and role allocator, procedure sequence clearly outlined at team brief

Plan

- Maintenance of cerebral and placental perfusion pressures balanced against optimal operating neurosurgical conditions
- Early securement of airway and intravenous anaesthesia
- Invasive haemodynamic monitoring and early vasopressor support
- Careful positioning following delivery for neurosurgical access

Next steps

- Early team and family debrief
- Midwifery involvement on Neuro-ICU
- Neurological monitoring and early post operative imaging
- MDT decision regarding venous thromboembolism prophylaxis
- Planning for further controlled debulking surgery

DISCUSSION

Glioblastoma accounts for approximately 15% of all brain tumours and is associated with significant mortality (1).

The constitution of symptoms e.g., headache, blurred vision and confusion may overlap with more common diseases of pregnancy such as pre-eclampsia. As such one should have a high index of suspicion if the parturient rapidly deteriorates or presents atypically. Where suspected, early imaging either by CT or MRI is advised, followed by an MDT approach.

In some instances, planned tumour debulking can be achieved semi-electively prior to delivery (2). In our case, the insidious presentation and acute decompensation both for the parturient and the foetus meant concomitant debulking and delivery was expedited.

The neurosurgical, obstetric and practical factors all pose great difficulty for the anaesthetist, and little literature exists regarding the optimal management of an emergency scenario where both operations must be done immediately (3)

Primarily, the team must be competent managing both specialist emergency surgeries. Practical considerations include specialist consultant presence, specialist neurosurgical and obstetric scrub staff, with experienced midwifery and neonatal colleagues. A clear, outlined plan must be established with all relevant members aware of their roles. The physical aspects of the movement of staff, rotation through theatre, and repositioning a patient immediately after an emergency caesarean all must be communicated to the team.

General anaesthesia for emergency caesarean is well practised. In this instance, careful consideration must be taken into maintaining cerebral perfusion pressure by avoiding labile haemodynamics, either at induction or intraoperatively. A modified rapid sequence induction and total intravenous anaesthesia was our preferred method of induction and maintenance, supported by vasopressors and invasive haemodynamic monitoring. Careful use of uterotonics must be considered to support stable haemodynamics.

Lateral positioning for tumour debulking following caesarean delivery should be taken with great caution to avoid surgical site compromise. If the parturient is cardiovascularly deplete, positioning will cause fluid shift further compromising cerebral perfusion pressure. Judicious fluid management, ionotropic support and avoidance of obstetric haemorrhage must all occur for safe surgery. Maintenance of cerebral perfusion pressure must be balanced against the risk of intracerebral bleeding or rising intracerebral pressures.

The emergency neurosurgical patient requires a period of post-operative ventilation, optimisation of cerebral physiology and monitoring in intensive care prior to extubation. This, of course, may be distressing for the family, and may affect bonding with the newborn. Both the newborn and the mother were monitored in their respective level 3 locations and were reunited approximately one week later.

CONCLUSION

Careful attention must also be paid to the human factors surrounding complex emergency surgeries in circumstances unfamiliar to the neurosurgical and obstetric anaesthetists and surgeons as well as the scrub, midwifery, neonatal and intensive care teams. When precise and coordinated care is required from such a large and diverse MDT, clear communication and allocation of roles are paramount in order to ensure the best possible outcome in rare circumstances.

References:

1. Gunasekaran A, Kulbarsh KD, Das A, Voelkel-Johnson C, Patel SJ, Lindhorst S, Yazdani M, Barley J, Rowland NC. Case report: Awake craniotomy during pregnancy for resection of glioblastoma. Clin Neurol Neurosurg. 2022 Mar 22;216:107218. doi: 10.1016/j.clineuro.2022.107218. Epub ahead of print. PMID: 35367747.
2. Abd-Elsayed AA, Díaz-Gómez J, Barnett GH, Kurz A, Inton-Santos M, Barsoum S, Avitsian R, Ebrahim Z, Jevtic-Todorovic V, Farag E. A case series discussing the anaesthetic management of pregnant patients with brain tumours. F1000Res. 2013 Mar 21;2:92. doi: 10.12688/f1000research.2-92.v2. PMID: 24358879; PMCID: PMC3814915.
3. Tewari KS, Cappuccini F, Asrat T, Flamm BL, Carpenter SE, Disaia PJ, Quilligan EJ. Obstetric emergencies precipitated by malignant brain tumors. Am J Obstet Gynecol. 2000 May;182(5):1215-21. doi: 10.1016/s0002-9378(00)70188-8. PMID: 10819861.