CASE REPORT

A 23-Year-Old Woman with Cerebellopontine Tumor Angle Sectio Caesarea Trans-peritoneal Profunda Surgery Over Oligohydramnios Indication

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ABSTRACT

Background: Primary tumor are rarely found in pregnancy. Treatment for intracranial tumors in pregnant woman is a challenge for anesthesiologists, obstetricians and neurosurgeons. A large size cerebellopontine angle (CPA) tumor can suppress the brain stem structure and cause death if not treated immediately. This makes the way we treat patients, when the delivery time and the surgical intervention we choose to be quite difficult.

Case: A 23-year-old female patient using general anesthesia (GA) to accommodate profunda trans-peritoneal cesarean section (SCTP) in a 36 weeks pregnancy age, G1P0A0, ASA IIIE with CPA tumor and oligohydramnions.

Disscussion: Brain tumor usually grow rapidly during pregnancy due to fluid retention, increased blood volume, and hormonal changes. There is no specific guidelines that explain the treatment of intracranial tumor in pregnancy. This patient suffers from CPA tumor and oligohydramnions so SCTP is required. We use GA for SCTP because it is safe for patients with intracranial tumor.

Conclusion: Female G1P0A0, 23-year-old, 36 weeks pregnancy age with CPA tumor was consulted by Obstetricians to Anesthesiologists to do SCTP with GA.

Keywords: cerebellopontine angle tumor; general anesthesia; pregnancy; oligohydramnions; SCTP

INTRODUCTION

Primary brain tumors are rare during pregnancy.[1] Management of maternity mothers with intracranial tumors is a challenge for anesthesiologists, obstetricians and neurosurgeons. During pregnancy, intracranial tumors may become symptomatic or there may be signs and symptoms that get worse. Tumors at a large cerebellopontine angle (CPA) tumor can press on brainstem structures and can be fatal if not treated promptly.[2] In the management of such patients, the assessment of the best time for neurological examination, surgical intervention, pregnancy disorders, and delivery is sometimes difficult and controversial.

Tumors in the central nervous system are one type of tumor that has the highest mortality rate and low life expectancy.[3] This is due to the progressiveness and location of the tumor that gives significant manifestations to the sufferer. The clinical manifestations of patients with brain tumors are often confused with other neurological diseases. The chronic course of the disease and does not improve with symptomatic therapy needs to be suspected with further supporting examinations.

Labor can increase intracranial pressure (ICT) and cause neurological damage to rapidly growing tumors. The choice of anesthesia technique depends on the status of the fetus, the type and location of the tumor, the neurological condition of the mother and the urgency of surgery.

Smooth induction and adequate depth of anesthesia are necessary to prevent increased ICT, but for the safety of the fetus it is often considered that minimal medication should be administered before birth. Anesthesia procedures should not cause permanent damage to the fetus or risk stressing the mother, adversely affecting the fetus.

Intensive care needs to be done in a multidisciplinary manner to help improve the quality of life of patients.[4] Cooperation in the implementation and selection of follow-up therapy after operative action needs to be done well so that patients can have a better life expectancy. We report anesthesia management of a 23-year-old patient who delivered by sectio caesarean (SC) on oligohydramnios indication with CPA tumors et causa epidermoid cysts.

Epidermoid cysts of the central nervous system are benign lesions of a congenital, rare, slow-growing nature, arising from ectopic inclusions of ectodermal cells during the closure of the neural tube between the third and fifth weeks of the embryo's life.[5] This type of tumor accounts for 1% of all intracranial tumors, about 40% of these tumors are located in the CPA tumor, representing the third most frequent lesion, after acoustic neuroma and meningiomas.[6,7] Clinically this tumor is progressive symptoms and signs, but tumor growth proceeds according to gestational age and tumor type. The onset of symptoms occurs between the second and fifth decades of life. Common presentations include a history of tinnitus and hearing loss, vestibular symptoms sometimes appear, symptoms of trigeminal neuralgia, facial paresis or hemifacial spasms, headache, hydrocephalus and aseptic meningitis may occur.[8]

Cerebellopontine angle (CPA) tumors are mostly benign, slow-growing tumors with low malignancy potential (~1%). The most common tumors in CPA are vestibular schwannomas, meningiomas, and epidermoid tumors. Schwannomas are primary lesions of cranial nerves

involving the trigeminal, facial, glossopharyngeal, vagus, and sometimes even accessory cranial nerves. The etiology of vestibular schwannoma is still unknown. However, there are two main types. Sporadic is a unilateral tumor and most often appears between the fourth and sixth decades of life. Tumors associated with neurofibromatosis type 2 (NF2). The most common presentation is bilateral acoustic neuroma in younger patients with a positive family history. Neurofibromatosis type 2 (NF2) results from mutations in chromosome 22q12. These mutations lead to an increased risk of other intracranial tumors as well.[10]

Meningiomas arise from the proliferation of arachnoid meningotel cells, most commonly from the dura of the temporal bone of the petrosa or internal auditory meatus. Epidermoid tumors arise from the innate misplacement of ectodermal cells during neural tube closure.[10,11] An arachnoid cyst is a cyst filled with cerebrospinal fluid (CSF) that arises from the rupture of the embryonic arachnoid membrane.[11]

The cerebellopontine angle (CPA) is a triangular space in the posterior cranial fossa bounded by the superior tentorium, posteromedial brainstem and petrosal portion of the posterolateral temporal bone. It is an anatomically and clinically important landmark because it is occupied by the CPA tank, which houses the CRANIAL NERVES V, VI, VII, and VIII along with the inferior anterior cerebellar artery.[10] Clinical signs of CPA tumors stem from a variety of lesions involving this region, presenting with a myriad of non-specific symptoms, the most common being sensorineural hearing loss, tinnitus, and dizziness.

Common manifestations of lesions involving CPA are hearing loss, tinnitus, dizziness, vertigo, headache, and gait dysfunction. Hearing loss is mostly unilateral sensorineural and is caused by cochlear nerve involvement. Other cranial nerve deficits, symptoms of brainstem compression, and hydrocephalus may also be seen in larger tumors that press on these structures.

The diagnosis of CPA tumor is established based on history, physical examination, audiometry, and radiological evaluation. Magnetic resonance image (MRI) is the gold standard for CPA tumor diagnosis. High-resolution computed tomography (CT) is useful for assessing bone involvement. Vestibular schwannomas appear isodense on CT, hypointense on T1 and hyperintense on T2 MRI.[11] Meningiomas appear hyperdense at CT, hypointense at T1, and hyperintense at T2. Features that distinguish meningiomas from vestibular schwannomas include the appearance of hyperdenses on non-contrast CT, lack of erosion of the internal auditory canal, extensive dural attachment, cerebrospinal fluid (CSF) gap between tumors, brain parenchyma, and thickening of the dura around the tumor (dural tail sign).[12] Headaches are more common in meningiomas, while vestibular schwannomas appear with severe hearing loss. Epidermoids are accompanied by non-specific signs and symptoms of CPA. The radiological picture can vary, the most common being hypointense T1 and hyperintense T2 ('black lesions').[11, 12]

More sophisticated MRI data information such as magenetic resonance (MR) spectroscopic metabolite peaks and perfusion ratios are needed to distinguish meningiomas from vestibular schwannomas. Better information about more specific features such as the shape of the ice cream cone, adjacent hyperostosis, the presence of calcifications, the dural tail that may extend into the foramina of the base of the skull will aid in the final diagnosis.

Treatment options for CPA tumors include observation, radiation therapy, or microsurgery. Observation is suitable for elderly/unstable patients and in tumors with little/no evidence of growth. Tumors are monitored with regular annual scans, and tumor growth requires aggressive treatment. Another disadvantage of this approach is that cranial nerve function becomes difficult to maintain with delays in treatment.

Radiation therapy provides adequate tumor control with a low recurrence rate.[13] However, deteriorating hearing status and cranial neuropathy are also common side effects after radiosurgery.

It must be remembered that any surgical approach is a challenge in treating CPA tumors because it involves complex regional anatomy, very large vital structures that exist in the surgical field, and because it allows very narrow surgical corridors to operate.[14] In the case of meningiomas, complete surgical excision of the tumor along with the hyperostotic bone and surrounding dura is an option. But in vestibular schwannomas, the strategy has been changed from total radical excision to more aggressive subtotal excision to preserve neurological function.

Microsurgery offers the definitive solution. The goal of microsurgery is the complete removal of the tumor as well as the preservation of hearing. Different surgical approaches that can be used are the translabrynthine, middle fossa, and retrosigmoid approaches.[12] The choice of surgical procedure is made based on tumor size, tumor expansion within the canal, surgeon preference, and basic hearing function.[15] The most commonly used approach is the retrosigmoid or sub-occipital approach. This approach allows preservation of hearing while providing adequate exposure. Disadvantages of rectosigmoid include CSF leakage, headaches, cerebellar retraction, and a higher risk of tumor recurrence due to the limited ability to remove the intracanalalicular portion of the tumor.[13] However, a combined endoscopic/microscopy approach can improve access to deep lesions.

The middle fossa approach is most useful for intracanacular expansion resection of tumors. The disadvantages of the middle fossa approach include temporal lobe retraction, hematoma after rupture of the media meningea artery, and a higher risk of facial nerve injury. The translabrynthine approach can be used in patients without correctable hearing because the surgical morbidity of this procedure is low compared to others.[12]

A thorough preoperative evaluation of neurological condition and cardiorespiratory status is essential for the safe administration of anesthesia for posterior fossa surgery. Regular assessments of medical conditions that coexist with a view to optimization should be carried out. Other important aspects of preoperative assessment include the following:[16] (1) evaluation of cerebellar and cranial nerve dysfunction: the presence of compression and lower

cranial nerve dysfunction can lead to loss of gag reflex and aspiration pneumonitis. In some patients with bulbar dysfunction, postoperative ventilation or tracheostomy may be necessary to protect the airway. Cerebellar signs may include ataxia, dysarthria, gait disorders and deliberate tremors; (2) evaluation of elevated ICT: hydrocephalus and elevated ICT are common in patients with posterior fossa pathology. A decrease in the level of consciousness and a change in breathing patterns may indicate an increase in ICT and, in such circumstances, CT or magnetic resonance imaging is mandatory. External ventricular drainage or other shunt procedures may be indicated to manage hydrocephalus before surgery or intraoperatively; (3) Evaluation of hydration status and electrolyte disturbances: dehydration is frequent and multifactorial. Reduction of oral intake due to decreased level of consciousness, vomiting, administration of diuretics, presence of diabetes insipidus and intravenous use of contrast agents to facilitate imaging contribute to dehydration and electrolyte disorders. Intravenous administration of fluids and optimization of electrolytes should be considered individually; (4) Evaluation for intraoperative position: The patient should be carefully assessed for the suitability of the surgical position. The prone position can be difficult in obese patients. The presence of a patent foramen ovale (PFO), which has an incidence of 10-35%, can hinder the use of a sitting position, although paradoxical embolism can occur even in its absence.[8] As paradoxical complications of air embolism can be damaging, screening for PFO by echocardiography of bubble contrast and closure if any should be considered in which sitting position would have a major advantage in surgical outcome. (Table 1)

Table 1. Contraindications of intraoperative sitting position

Absolute contraindications	Relative contraindications
Ventriculo-atrial shunt	Patent foramen ovale
Right to left heart shunt	Uncontrolled hypertension
	Old age
	Neuropaths autonomous berat

Airway evaluation: patients with atlanto-axial subluxation and lack of neck movement due to cranio-cervical fusion may pose challenges during airway management and positioning.

Posterior fossa surgery can be performed in supine positions, prone to stomach, sitting, lateral, and garden benches. Acoustic neuroma and CPA tumors can be performed in the supine position with the head facing opposite sides, and placement of sand pockets under the ipsilateral shoulders to minimize stretching of the brachial plexus. The prone and sitting positions offer good access to structures on the midline, but care must be taken to avoid abdominal compression to minimize surgical bleeding. The lateral position facilitates gravity-assisted drainage of blood and CSF and provides good surgical access for unilateral procedures. The position of the park bench is a modification of the lateral position where the patient is positioned semi-prone with his head bent and facing the floor. This facilitates greater access to midline structures and, in certain patients, avoids the need for a prone position. Care should be taken

during positioning to avoid detachment of tracheal lines and tubes, and protection of pressure areas.

The sitting position improves surgical access to the posterior fossa by facilitating gravity-assisted blood drainage and CSF and lowering ICT (Figure 1). This improves surgical orientation, access to midline structures and reduces the number of surgical retractions required to gain access to deeper structures. The patient in a sitting position should be quickly returned to the supine position for resuscitation measures in case of acute cardiovascular collapse.[19] Sitting position is associated with several potential complications including the following: (1) Cardiovascular instability; (2) venous air embolism (VAE); (3) pneumocephalus; (4) macroglossia; (5) quadriplegia.

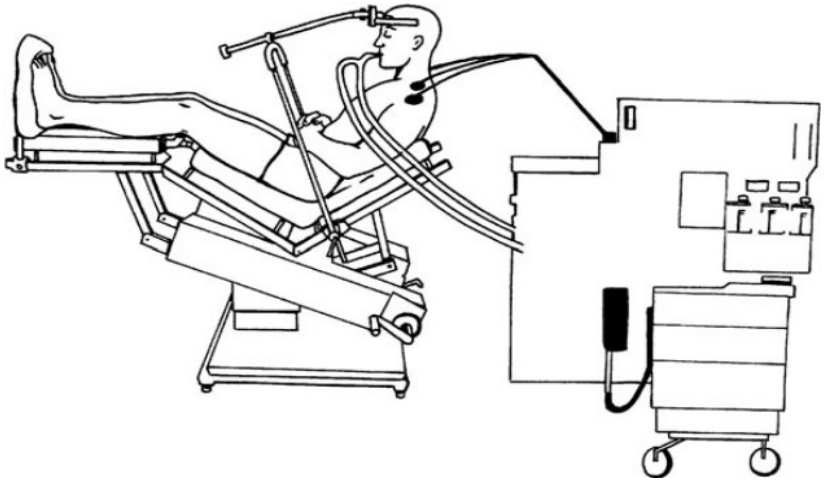

Figure 1. Intraoperative position in neurosurgical operations[19]

The objectives of anesthesia management are to avoid significant increases in ICT, maintain cerebral perfusion pressure, avoid hemodynamic instability, enable intraoperative neuro-monitoring and ensure early detection and management of complications. Hemodynamic instability during induction and positioning should be avoided and disturbances in monitoring during positioning minimized. Remifentanil may be used in patients with elevated ICT to reduce the stress response to intubation. Both inhaled and intravenous This technique can be used for maintenance anesthesia, but nitrous oxide should be avoided, especially in patients with a high risk of venous air embolism (VAE) or pneumocephalus. Any unexpected hemodynamic changes or instabilities should be notified to the surgeon immediately as they may indicate the proximity of the surgery to vital centers. Normothermia must be maintained throughout. Careful observation of the patient's blood loss and volume status should be ensured.

Proper intraoperative monitoring is essential during posterior fossa surgery. Regular monitoring should include pulse oximetry, ECG, capnography, and temperature. Invasive artery monitoring will allow for accurate pulse-by-beat variability measurements and blood pressure control, and is a must. The arterial transducer should be placed at the level of the external auditory meatus to correlate with cerebral perfusion.

The use of a central venous catheter in the right internal jugular vein is common practice in patients undergoing surgery in a seated position as it allows assessment of volume status and air aspiration during VAE. Measurement of urine output with a sedentary urinary catheter is also important.

Extubation depends on the patient's condition before surgery and intraoperative course. In patients who are neurologically intact and who have undergone surgery smoothly, smooth extubation should be performed and the patient monitored for signs of neurological changes in areas of high dependence. The presence of lower cranial nerve dysfunction and potential aspiration pneumonia may require postoperative ventilation. Extensive intraoperative dissection, especially at the base of the fourth ventricle and around cranial nerve nuclei, can cause postoperative airway disorders after extubation. Airway edema after a prolonged prone position and swelling of the tongue after a sitting position are not uncommon. ICP monitoring should be considered if postoperative ventilation is required because hydrocephalus remains a risk. Postoperative hypertension should be carefully managed to avoid bleeding complications.

Postoperative nausea and vomiting *(*PONV) and pain are important considerations after posterior fossa surgery. The occipital and infratentorial approaches are associated with severe postoperative pain due to extensive muscle cutting and reflection and subsequent spasms. All patients undergoing surgery on the posterior fossa should be considered at high risk of PONV due to the proximity of the vomiting center to the vomiting center. surgical locality. The use of opioids to control pain after extensive muscle cutting surgery complicates matters.[20]

CASE

A 23-year-old woman G1P0A0 gestational age 36 weeks. The patient has no allergies and no previous medication history. The patient has no other diseases and no previous history of surgery. The patient fasts 6 hours before the procedure and gets a headache. The patient appears moderately ill, compos mentis consciousness. Blood pressure 115/85 mmHg, pulse 98x/min, respiratory rate 20x/min, apefris temperature, saturation 99% room air. Generalist status within normal limits. Neurological status is acquired dysfunction of nerve II dextra, parese nerve III dextra. dysfunction of nerve V dekstra, parese nerve VII sinistra peripheral type. Motor function is obtained motion and strength decreases on the left side of the body. Tonus, trophies, physiological reflexes within normal limits. A pathological reflex and cloning of the inferior extremity of the left side were obtained. The patient did not get His and vaginal discharge. Fetal heart rate 129 bpm. Internal examination has no opening, amniotic skin and effacement are difficult to judge, the portio is supple posterior, the lower part of the fetal head is still high. Blood tests obtained hemoglobin 10.6 g / dL, hematocrit 33.3%, leukocytes 10500 / uL, urea 9 mg / dL, creatinine 0.6 mg / dL.

CT-Scan of the head obtained cystic lesions with solid parts and rims of multilobulated shape firm borders of regular edges in the temporal region, right CPA size (3.84 x 4.49 x 3.87 cm), mass picture/SOL, accompanied by an increase in current ICT. Abdominal ultrasound shows fetus I live intra uterine, location of right back oblique with FM +, FHM +, FHR 152 bpm, AVG

/ EFW: 35w5d / 2,784 grams, placenta implantation in the fundus extends to the anterior corpus less to SBR, grade II, calcification, liq amnii impression exhausted. Currently, there are no major congenital abnormalities of the fetus. Doppler A. umbilicalis Ri: 0.52 (among 5-50th percentile), Pi: 0.73 (among 5-50th percentile).

Assessment obtained G1P0A0 23 years pregnant 36 weeks 4 days, fetus I live intrauterine, location of right back oblique, oligohydramnios, tumor cpa right ec epidermoid cyst, progressive chronic cephalgia, parese nerve vii sinistra peripheral type, nerve dysfunction ii dekstra, nerve dysfunction v dekstra, parese nerve iii right, anemia mild, increased ICT, mild malnutrition. Patients are planned for malnutrition diet, DJJ supervision with sedentary KTG, vitamin bc/c/sf 1 tab/12 hours, pro sctp cito on indications of oligohydramnios and CPA tumors, proposal of craniotomy skull base tumor evacuation, MRI of the head with contrast according to the field of neurosurgery, blood effort 1 prc, ICU backup intactive.

Table 1. Intraoperative conditions

Hour	18.30	19.00	19.30	20.00
TD	120/80 mmHg	115/75 mmHg	110/70 mmHg	112/72 mmHg
HR	121	106	89	71
RR	16	16	16	16
Sat	100	100	100	100

Intraoperative conditions. Obtained at 18.30 given drugs in propofol 100 mg, fentanyl 100 mg, rocuronium 30 mg, and paracetamol 1000 mg. At 19.00 enter the drug oxytocin 20 iu drip, metergin 1 ampoule, and tranexamic acid 1 gram. At 19.30 enter ketorolac 30 mg. The liquid enters the lactate ringer 500 ml, the next 30 minutes 500 ml, and continued 200 ml. Urine 100 ml and bleeding 400 ml.

Postoperative follow-up condition H+1 obtained postoperative pain. The general state is good, composmentist consciousness. Blood pressure 109/80 mmHg, pulse 86x/min, respiratory rate 22 x/min, apefris temperature. Generalist status within normal limits. Patients received nfus RL+ oxytocin therapy 10 IU 20 tts/min (2 bottles), PO Vit BC/C/SF 1 tab/12 hours, vitamin A 200,000 IU/24 hours (for 2 days), surgical wound hygiene, exclusive breastfeeding, high pillow sleep 24 hours postoperatively, diet according to TS Nutrition, gradual mobilization, paracetamol 1000 mg tab/8 hours orally for 2 days, ketorolac 30 mg inj/8 hours intravenously for 2 days, PRC blood effort, metoclopramide 10 mg inj/8 hours intravenously for 2 days, fentanyl 100 mcg in RL 500 mL drip infusion path 20 tpm.

DISCUSSION

Brain tumors tend to increase in size during pregnancy due to several factors such as fluid retention, increased blood volume and hormonal changes so that they can be diagnosed early. The decision to proceed with neurosurgery operations during pregnancy depends on the location, size, type of tumor, signs of neurological symptoms, fetal age, and wishes of the patient.[21,22]

There are no guidelines for the management of intracranial tumors in pregnant women. Possible algorithms to follow are shown in Figure 1 by Tewari

et al.[23] CPA tumor is a triangular area of the posterior fossa bounded by the temporal bone, cerebellum and pons. In this area there is often an abnormal period which is then referred to as CPA tumor, often occurs in adults and comprises 5-10% of all intracranial tumors.[10]

Clinical manifestations in patients with CPA tumors include hearing loss and labyrinth dysfunction, occipitofrontal pain, cerebellar ataxia and various cranial nerve disorders. Symptoms that occur in CPA tumors vary greatly depending on the size, location and progression of the tumor.[3]

Preoperative preparation including on the choice of anesthesia technique should be appropriate to the clinical situation. Pre-anesthesia evaluation for emergency cesarean section should be with prompt assessment to determine the risk of difficult airway, obstetric hemorrhage and risk of aspiration. Preoperative investigations required are complete blood tests, blood grouping and cross matching and if absolutely necessary kidney function, liver function tests and coagulation profiles. This patient is performed GA because the mother has increased ICT caused by CPA tumors. It is absolutely contraindicated to perform regional spinal anesthesia.[24]

General anesthesia (GA) is safe to use in patients with intracranial tumors. Tracheal intubation is very important because it allows hyperventilation of the mother so as to control the increase in ICT.[25] Patients should be premedicated with intravenous 50 mg ranitidine injection and 4 mg ondansetron injection intravenously to protect the patient from possible vomiting and aspiration.

Propofol is used in our patients without causing any side effects. The main side effect is that it has a relaxing effect on the uterus. It is still controversial whether its use is safe for newborns. Bacon et al.[26] reported no propofol side effects in newborns after emergency SC while another study reported seizures, ataxia, and hallucinations after prolonged propofol anesthesia for more than 6 hours.[27] Induction of rapid sequence intubation with cricoid pressure was performed using propofol, 2.5 mg/kgBB, and rocuronium 0.6 mg/kgBB.[28]

In the induction process patients are given propofol 100 mg, fentanyl 100 mcg IV, O2: sevoflurane (single breath rapid induction) Sellick's maneuver, and rocuronium 30 mg IV. Patients given sevoflurane associated with the main problem of using GA for SC is the onset of maternal awareness associated with the use of small doses and low concentration anesthesia with the aim of minimizing the effects on neonatal. The use of low concentrations of strong volatile anesthetic agents will successfully prevent consciousness without adverse neonatal effects or excessive uterine bleeding. As mentioned above, desflurane 4.5% or sevoflurane 1.5% in 50% nitrous oxide has been shown to guarantee such things. In these patients during surgery obtained stable hemodynamics, bleeding 400 cc. Baby born crying with AS 9-9-10.

At the end of the procedure, neuromuscular blockade can be antagonisted using neostigmine (50 mcg/kgBB) combined with anticholinergics (e.g. atropine 25 mcg/kgBB). The majority of patients can be extubated after regaining consciousness, avoiding hypercarbia, and with techniques that minimize the

risk of aspiration (lateral or sitting). Analgesia can be achieved with a combination of paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs) if not contraindicated with additional oral opioids to relieve pain. Patients should be monitored in an appropriate environment by interprofessionals, especially neurosurgeons, as a result of regular neurological observation. The patient was admitted to the ward for five days in collaboration with a neurosurgeon. The patient plans to be discharged first.

CONCLUSION

A woman with a diagnosis of G1P0A0 23 years pregnant 36 weeks 4 days, fetus I live intrauterine, location of the right back oblique, oligohydramnios with tumors of right CPA et causa epidermoid cyst, progressive chronic cephalgia, parese nerve VII sinistra peripheral type, dysfunction of nerve II dekstra, nerve dysfunction V dekstra, parese nerve III right, anemia mild, increased ICT, and mild malnutrition are consulted by the obstetric gynecology department to anesthesiology and intensive therapy for SC surgery with GA.

During anesthesia and surgery, no complications were found. After the operation is completed, the patient is monitored in the recovery room, During the monitoring period the patient's condition is good, vital signs are stable, visual analog scale (VAS) score 1-2, no side effects are found.

In these patients are considered for termination of pregnancy related to the well-being of the mother and baby. Management of brain tumors in pregnant women is very dependent on the case and personal experience of the doctor. Therefore, close communication between neurosurgeons, neuroanesthesiologists, gynecologists and patients is essential.

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