



CASE REPORT

Pregnancy in a Persistent Vegetative State: A Management Dilemma. Case Report, Literature Review and Ethical Concerns

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Abbreviations

AV	arterio-venous
ICH	intracranial hemorrhage
ECA	external carotid artery
ICA	internal carotid artery
MCA	middle cerebral artery
DSA	digital subtraction angiography
PVS	persistent vegetative state

Introduction

Persistent vegetative state in pregnancy is a rare and challenging scenario, discussed here.

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Case

A 32-year-old primigravida with a history of 3-month amenorrhea was referred to our institute's neuroemergency with sudden onset severe headache, vomiting and weakness of right side of the body. She had no previous medical concerns. On arrival, she was conscious, but had right hemiplegia. A diagnostic digital subtraction angiography (DSA) of the patient was done, which was suggestive of high flow arteriovenous fistula in left temporo-parietal region with feeders from superior and inferior divisions of left middle cerebral artery (MCA) draining into superior sagittal sinus, external–internal carotid artery (ECA- ICA) anastomosis and at cavernous segment of ICA. After being informed the risks of procedure and its complications, including effect on her fetus, she underwent a DSA embolization of arteries supplying the fistula while a lead screen covered the abdomen. Post-embolization runs showed occlusion of the fistula with normal opacification of left middle and anterior cerebral artery branches. Immediate post-procedure her CT scan suggested increase in the left temporo-parietal intracranial hemorrhage (ICH) with significant midline shift due to normal perfusion pressure breakthrough and diversion of blood flow to the normal intracranial vessels. While her pupils started to dilate, she underwent an immediate left fronto-temporo-parietal decompressing hemicraniectomy with lax duraplasty (Fig. 1). Postoperatively, she needed prolonged ventilatory support and was tracheotomized. She had a vacant stare and stereotypic facial movements, there were no purposeful movements, and the significant damage to the brain led her to the persistent vegetative state (PVS).

Though the family did contemplate termination of pregnancy, they decided to continue pregnancy. She received Ryle's tube feed, regular physiotherapy and anti-seizure prophylaxis. She developed a bed sore and received antibiotic for fever and recurrent urinary infection. All this while, she had no obstetrical problems. Fetal anomaly scan

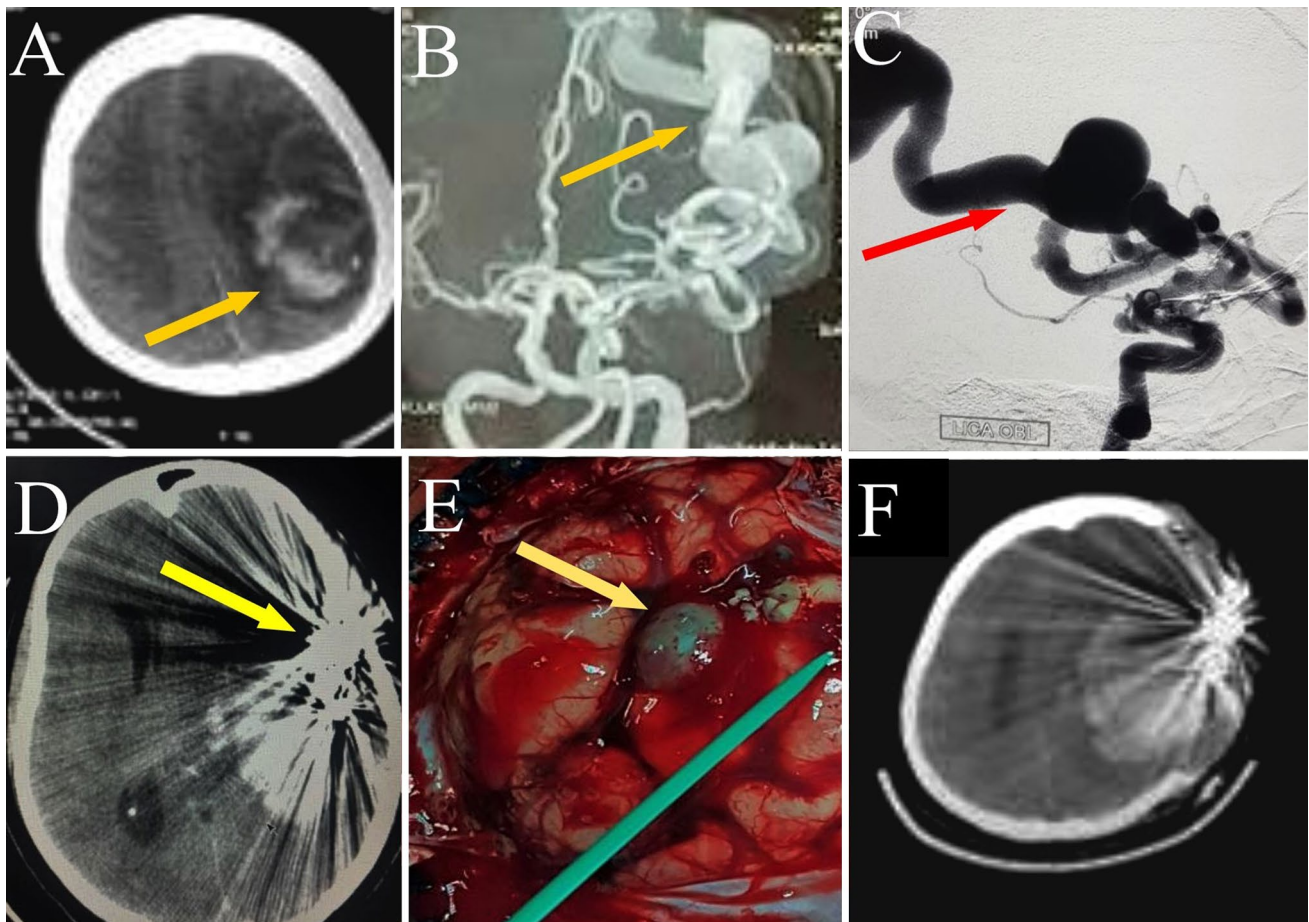


Fig. 1 **a** Intraparenchymal hemorrhage in left parietal region (yellow arrow), **b, c** MR angiography and DSA showing the large pial AV fistula (yellow and red arrow), **d** post-procedure scan showing coils with the increase in hematoma and mass effect (yellow arrow) (**e**), Intra-

operative image showing the obliterated pial AV fistula with edematous brain (yellow arrow), **f** postoperative scan following decompressive hemicraniectomy

was normal. Regular ultrasounds for growth monitoring revealed mild fetal growth restriction, but biophysical profile remained normal. She received antenatal steroids for fetal lung maturity. Decision was taken to terminate the pregnancy at term or earlier in case of maternal or fetal deterioration. Decision for mode of delivery was perplexing. In lieu of the low but potentially existing risk of intracranial rebleed with valsalva and the inability of the patient to maintain a position for delivery (due to her spastic paralysis), an elective caesarean section was planned. After consultation with the anesthetists, neurosurgeons, obstetricians, neonatologist, the hospital administration personnel and the family, consent for surgery was taken from the husband. She underwent an elective caesarean section at 37 weeks and delivered a live born girl of 2.3 kg, with an Apgar of 8 and 9. Intra-operatively, she developed atonic postpartum hemorrhage which was managed by uterotonics and uterine artery ligation. She remained stable postoperatively and was discharged after 2 months of stay.

Discussion

Persistent vegetative state is defined as a state characterized by a normal brain stem function with absent cerebral function or lack of awareness, present for more than one month after an acute traumatic or non-traumatic brain injury or lasting for at least one month in patients with degenerative/disorders. Normal sleep–wake cycle and respiration differentiate PVS from coma and brain death. The patient may show swallowing, chewing, random eye movements or other purposeless body movements. Though there is no cortical awareness of pain, changes of pulse, respiration and blood pressure may be noted with it. PVS is rare, with few cases reported. Life expectancy is 2–5 years and long-term prognosis is poor [1]. Causes of PVS may be neurological like ruptured aneurysm, spontaneous hypertensive hemorrhage, anoxic ischemic encephalopathy due to cardiac arrest, accident or failed suicide [1].

The aim of management in a woman with pregnancy and PVS would be to maintain basic body function of the mother with a low but chance prospect of maternal recovery [1]. However, the chances are bleak if no recovery occurs for over twelve months in traumatic and 3 months in non-traumatic cases [1].

The ethical concerns in management include whether the pregnancy should be continued in such a situation, whose interest is more important—the fetus or the mother—and who is the proper surrogate decision maker in the absence of a living will or legal attorney [1]. Most literature on such cases comes from developed countries [2]. In the absence of the patient's capacity to make decisions, ethical principles of beneficence and non-maleficence and justice become paramount [3]. Ethical issues of the rights of the unborn child, what would have been the will of the mother (who presently lost her capacity) for withdrawal of life support in the state of pregnancy, wishes of the family and social costs add to the dilemma in such cases [3]. Most authors and academic organizations have supported collective decision-making, considering the wishes of the mother as paramount [2]. Despite reports of successful fetal outcome for women presenting in first trimester, the chances would improve with the higher gestation at which the mother suffered the neurological insult. Discussion with the family should include wishes of the mother, prognosis of the mother and the fetus, social costs and also issues related to organ donation [4].

There is difference of opinion in the law in different parts of the world on whether life support can or cannot be withdrawn to a pregnant woman with brain extensive brain injury [2]. With the patient maintaining her vitals and no further threat to the life of the mother or the fetus by continuation of pregnancy, medical termination of pregnancy is controversial.

The medical management of a pregnant patient with PVS includes multidisciplinary input, with involvement of the neurologist, neurosurgeon, an obstetrician, critical care team along with the ethics committee, social workers and legal counsel. Medical problems may include cardiovascular instability, hyperthermia, pituitary failure and infections [4]. The patient may require airway support, sedatives and anti-epileptics, prolonged catheterization, antibiotics, dialysis, cardiovascular and nutritional supplementation. Due to the catabolic state, the woman requires a 3000 to 4000 calories per day. Teratogenic medications should be avoided. Ultrasonographic assessment for the fetal anomalies and aneuploidy screen should be done [4]. Having sustained an anoxic insult, fetal neurological assessment may be done by the presence of ventriculomegaly, microcephaly and intrauterine growth restriction and assessment of variability on cardiotocography in the third trimester [5]. Careful monitoring should be done for abnormal fetal growth, preterm labor or rupture of

membranes, and bedside ready preparation for emergency caesarean section and neonatal resuscitation in case of maternal cardiac arrest needs to be available at all times [1]. There is no consensus on timing of delivery, cases reporting delivery from 28 weeks onwards. Though there were more caesarean sections than vaginal deliveries done in cases reported, vaginal delivery is possible [4]. Pain relief should be provided to avoid cardiovascular instability. Level of block cannot be assessed in regional anaesthesia. General anaesthesia needs may be tailored to provide pain relief and lesser muscle relaxants. Postoperatively, thromboprophylaxis should be given. Lactation suppression should be given if not breastfeeding.

Finally, pregnancy in a woman with PVS is an emotional, clinical and ethically challenging scenario that requires a multidisciplinary care. Laws may vary in different regions. Continued pregnancy care includes good dietary and supportive care, fetal monitoring and multidisciplinary planning for delivery.

Lessons Learnt and Recommendations

- Pregnancy in a woman with persistent vegetative state is an emotional, clinical and ethically challenging scenario that requires a multidisciplinary care from the neurologist, neurosurgeon, an obstetrician, critical care team along with the ethics committee, social workers and legal counsel.
- Laws on life support in these situations vary in different regions. There is need for recommendations/ guidelines from medical societies and legal counsel/ attorneys in our country.
- Decision whether to continue life support for the baby in case brain death or persistent vegetative state develops in pregnancy should be discussed, in the early antenatal visits.
- Continued pregnancy care should include good dietary and supportive care, fetal monitoring and multidisciplinary planning for delivery including pain relief. Thromboprophylaxis should be considered as well.

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Compliance with Ethical Standards

Conflicts of interest There are no conflicts of interest.

Human and Animal Rights The report is in accordance with the 1964 Helsinki Declaration.

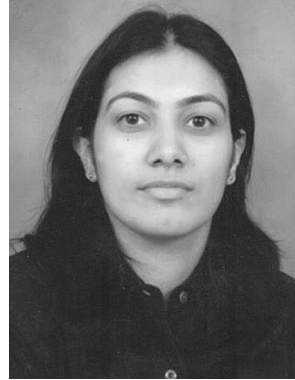
Informed Consent An informed consent has been taken from the husband and the relatives of the patient as patient was in vegetative state.

About the Author

References

1. Bush MC, Nagy S, Berkowitz RL, Gaddipati S. Pregnancy in a persistent vegetative state: case report, comparison to brain death, and review of the literature. *Obstet Gynecol Surv.* 2003;58(11):738–48.
2. Burkle CM, Tessmer-Tuck J, Wijdicks EF. Medical, legal, and ethical challenges associated with pregnancy and catastrophic brain injury. *Int J Gynaecol Obstet.* 2015;129(3):276–80.
3. American College of Obstetrics and Gynecology. ACOG Committee Opinion No. 390, December 2007. Ethical decision making in obstetrics and gynecology. *Obstet Gynecol.* 2007;110(6):1479–87.
4. Feldman DM, Borgida AF, Rodis JF, Campbell WA. Irreversible maternal brain injury during pregnancy: a case report and review of the literature. *Obstet Gynecol Surv.* 2000;55(11):708–14.
5. Webb GW, Huddleston JF. Management of the pregnant woman who sustains severe brain damage. *Clin Perinatol.* 1996;23(3):453–64.

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