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Case Report

A Case Report: Acute Symptomatic Seizure Associated Brain Metastasis in Pregnant Woman

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Abstract
Pregnant women can present with a wide variety of neurological conditions. Conditions including epilepsy, eclampsia, facial nerve palsy, pituitary tumor, cerebrovascular disorders, myasthenia gravis, multiple sclerosis, and nonpituitary intracranial tumors could be encountered. (Cheung, 1997).We describe a patient who presented with Acute Symptomatic Seizure Associated Brain Metastasis In Pregnant Woman. She came to the hospital because of a fit event and sudden left hemiparalysis and was diagnosed as a stroke, but further examinations revealed unexpected results. Brain imaging suggested brain metastasis was encountered, but histopathological examination did not support this data. More investigations are needed to determine the true etiology of her fit attacks. This patient's diagnosis and management were even more challenging since she's now at nine weeks gestation.

Keywords— pregnant woman, brain metastasis, acute symptomatic seizure

I. Introduction:

Pregnant women can present with a wide variety of neurological conditions. Conditions including epilepsy, eclampsia, facial nerve palsy, pituitary tumor, cerebrovascular disorders, myasthenia gravis, multiple sclerosis, and nonpituitary intracranial tumors are encountered. (Cheung, 1997).

A 32-year-old nulliparous woman at nine weeks of gestation presented with a sudden left hemiparalysis and secondary generalized tonic-clonic seizure. There was no history of attacks before. She denied having previous severe headaches and visual disturbances. Initial physical examination revealed a hemodynamically stable woman (blood pressure 140/90, pulse 99/min) who was alert and oriented with slight slurring of speech, a mild left-sided facial droop, and bilateral sixth nerve palsies. Her motor examination revealed 0 strength of the left upper and lower extremities. The remainder of her physical exam was within normal.

The occurrence of brain tumors during pregnancy is unusual; when this happensjeopardizes the lives of both mother and infant. Its occurrence is infrequent. Isla et al. observed only seven women with a brain tumor in a series of 126,413 pregnancies. (Lynch et al., 2011; Bodner et al., 2006; McKenzie et al., 2005; Leeners et al., 1997) Relative to a non-pregnant population, malignant tumors have been described to be less common in pregnant women. It also creates a real challenge of a neurosurgical, clinical, obstetric, ethical, and psychological nature, so a multidisciplinary approach should be used in their care. (Lynch et al., 2011; Patel&Sharan, 2004)

II. Case Illustration

We reported a patient who presented with Acute Symptomatic Seizure In Pregnant Woman. She came to the hospital because of a fit event and sudden left hemiparalysis and was diagnosed as a stroke, but further examinations revealed unexpected results. Imaging examinations revealed brain metastasis. This patient's diagnosis and management were even more challenging since she's now at nine weeks gestation.

A thirty-two-year-old G_3P_2 at nine weeks gestation was admitted to the Neurology department of Dr. M. Djamil Hospital Padang, West Sumatera,with Sudden paralysis of the left limbs since 6 hours before being hospitalized. It was felt suddenly during the activity. The patient suddenly fell to the

left and could not move her left limbs at all. She remained conscious. The left arms' weakness was as severe as in the left legs.

These complaints were also accompanied by asymmetrical lips, slurred speech, and secondary generalized tonic-clonic seizure. The seizure began with rigidity on the left lower limbs and spread to the upper limbs for 30 seconds, followed by a clonic event for 1-2 minutes. She was unconscious during the fit and wetting her pants. She looked sleepy and tired after the seizure attack and remained conscious. The fit occurred six times with the same pattern and interval of one hour. She remained aware between the reasonableperiod. She also complained of headaches before the attack and vomited twice.

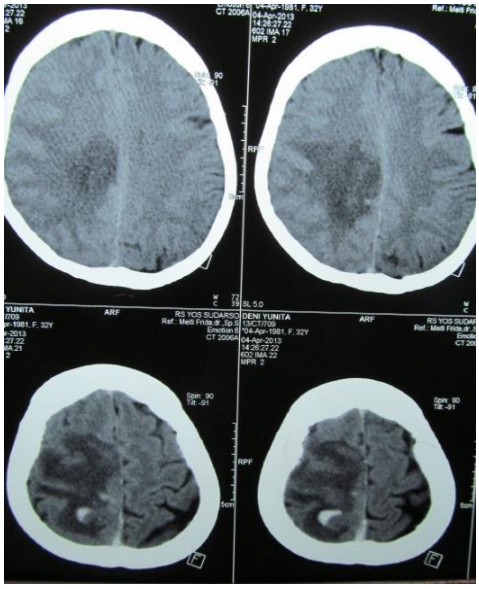
There was no history of seizure before and hypertension, diabetes, stroke back, head trauma, central nervous system infection.

No family member suffers from hypertension, heart disease, diabetes, and stroke.

The patient is a nurse who lives with her husband and one daughter. The patient is nine-week pregnant. She doesn't smoke and drinks coffee. No history of using any hormonal birth control.She was born at 38 weeks of gestation after spontaneous delivery—norecord of delayed developmental and physical problems.

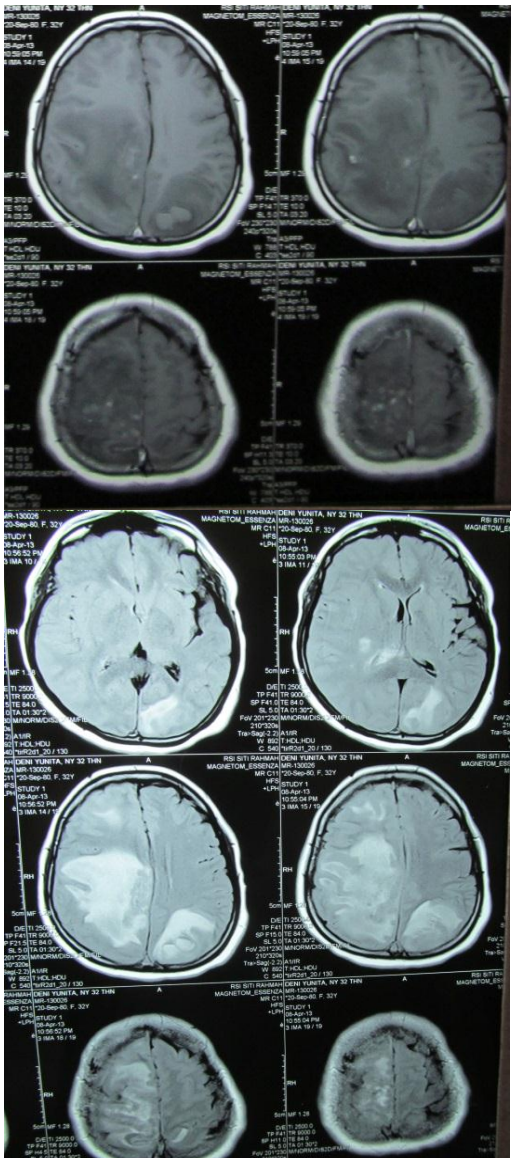
Initial physical examination revealed a hemodynamically stable woman (blood pressure 140/90, pulse 99/min) who was alert and oriented with slight slurring of speech, a mild left-sided facial droop, and bilateral sixth nerve palsies. Her motor examination revealed 0 strength of the left upper and lower extremities. The remainder of her physical exam was within normal.

Laboratory findings and ECG recordings were normal. She was treated in the Emergency room with oxygen, Ringer Lactate infusion/12 hours, tranexamic acid injection 6qh, Citicholin injection 2qh, carbamazepine 200 mg.

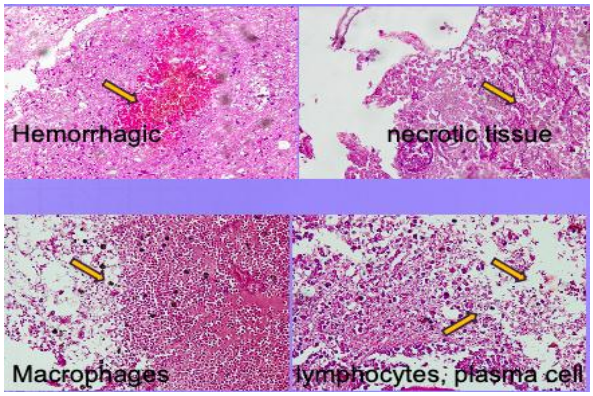


The result ofbrainCTscanwithoutcontrast:hyperdensionslesion seenonthe parietal region of right cerebralhemisphere with extensive oedema. midlineshift (+). Ventricle system, Pons andCPA, cerebellum are normal. Conclusion: intracranial mass with hemorrhagic lesion

The result ofMRI withcontrast:hyperintensemultiple lesion seenonthe temporoparietooccipital region of right cerebralhemisphere with extensive oedema and left parietooccipital regionwith unclear border. After contrast administration, the lesion becomes more hyperintense. midlineshift to the right. Ventricle system, Pons andCPA, cerebellum are normal. Conclusion: intracranial metastasis with subfalc herniation (hemorrhagic metastasis)



The patient was diagnosed with brain metastasis after a Brain MRI had been conducted. Neurosurgeon consultation also supported the diagnosis and was planned for craniotomy. The histopathological examination was astonishing since it revealed only chronic inflammation. There were no cell tumors.



The patient was discharged after rehabilitation therapy was conducted three times. But still, her muscle strength was zero. After two weeks of being discharged, she came with better improvement. Her muscle strength was 333 at left lower limbs and 444 at left upper limbs.

III. Discussion

A 32-year-old nulliparous woman at nine weeks of gestation presented with a sudden left hemiparalysis and secondary generalized tonic-clonic seizure. There was no history of attacks before. She denied having previous severe headaches and visual disturbances. Initial physical examination revealed a hemodynamically stable woman (blood pressure 140/90, pulse 99/min) who was alert and oriented with slight slurring of speech, a mild left-sided facial droop, and bilateral sixth nerve palsies. Her motor examination revealed 0 strength of the left upper and lower extremities. The remainder of her physical exam was within normal limits.

The patient was admitted for further evaluation with the underlying suspicion of a cerebrovascular event. Her hemoglobin, hematocrit, platelet count, coagulation profile, liver, and renal function tests were normal. Brain CT Scan revealed an intracranial mass with the hemorrhagic lesion. Magnetic resonance imaging (MRI) of the head revealed hyperintense multiple lesions seenonthe temporoparietooccipital region of the right cerebral hemisphere with extensive edema and left parietooccipital part with unclear border. After contrast administration, the lesion becomes more hyperintense. Midlineshift to the right. The suspicion was of anintracranial metastasis with subfield herniation (hemorrhagic metastasis).

The patient's clinical course was complicated by the moderate progression of the neurologic symptoms on the third hospitalization day. Dexamethasone intravenous therapy was given to reduce brain edema (dexamethasone 10 mg intravenously every 6 hours). Obstetrically, there was a normal fetus from fetomaternal USG. The neurosurgeon suggested craniotomy for biopsy and planned for radiotherapy or chemotherapy based on biopsy results. After the patient underwent craniotomy, the brain tissues were sent for histopathological examination. But apparently, the result was quite astonished since the result revealed only chronic inflammation.

The occurrence of brain tumors during pregnancy is unusual may jeopardize the lives of both mother and infant. Its occurrence is infrequent. Isla et al. observed only seven women with brain tumors in a series of 126,413 pregnancies. (Lynch et al., 2011; Bodner et al., 2006; McKenzie et al., 2005; Leeners et al., 1997) Relative to a non-pregnant population, malignant tumors have been described to be less common in pregnant women. It also creates a real challenge of a neurosurgical, clinical, obstetric, ethical, and psychological nature, so a multidisciplinary approach should be used in their care. (Lynch et al., 2011; Patel&Sharan, 2004)

In our case, the tumor was suspected of brain metastasis. She was also a nine week-pregnant woman at presentation (first trimester). Metastases can present before or simultaneously with the primary malignancy—fast-growing tumors, edema, and raised ICP to develop early in the clinical course. Highly vascular tumors such as melanoma, choriocarcinoma, and renal carcinoma are prone to bleed, mimicking a stroke. The location, number, and size of metastasis vary significantly at the cortex and white matter junction. (Haberland, 2007; Dorai et al., 2010)

The main problem of this patient has not known the primary. Patients diagnosed for the first time with probable brain metastasis (based on brain MR imaging) may or may not have a known primary. Perhaps one-third of all patients developing brain metastasis do not have previous cancer history. In most of these instances, the patients are suspected of suffering from lung cancer (Parizel et al., 2010; Sawaya et al., 2011; Dorai et al., 2010). The management of this patient should be tailored on exploring the primary tumor. Chest X-Ray, CT scans of the chest, abdomen, and pelvis, and blood tests such as Carcinoma Embryonic Antigen, Alfa Feto Protein. This patient has been tested for tumor markers. But the result was not supported. Other tests could not be done since the patient is eight weeks pregnant.

Clinically, brain metastasis could not be established from this patient since the primary tumor is not clinically evident. The primary cancers most commonly associated with metastasis are lung cancer (34%), breast cancer (21 %), melanoma (12 %), renal cancer (8 %), and colon cancer (6 %). Most brain metastases (80 %) are supratentorial, and nearly 50 % are multiple—melanomas, lung cancer, and breast cancer commonly present with multiple metastases.(Paduvally&Armstrong, 2004; Hanjani&Harsh, 2005).

Brain MRI supported brain metastasis diagnosis on this patient. Tumors are characterized by preferential involvement of white matter with sparing of cortical gray matter, round, or infiltrating shape, and are not confined to a specific vascular distribution. MRI is more sensitive than CT in detecting intracranial mass lesions because of the intrinsically higher soft-tissue contrast resolution and because the associated edema is easily observed on FLAIR and T2-W1. The peritumoral edema is more extensive than the tumor itself (Parizel et al., 2010). It is in accordance with our case. The imaging of this patient revealed extensive vasogenic edema and multiple lesions that are common in brain metastasis. Vasogenic edema is caused by a breakdown of the blood-brain barrier (BBB), which allows excess fluid to pass from the capillaries into the extracellular space. Vasogenic edema extends along white matter tracts and generally spare the cortical gray matter. (Parizel et al., 2010; Sawaya et al., 2011).

During pregnancy, the plasma volume increases from the sixth week to reach a maximum of approximately 3600 ml by the 32± 34th week. The cardiac output increases by 20% (5.5 l/min at conception to 6 l/min) during the first trimester and remains the same to term. These changes depend on increased production of estrogen and progesterone by the trophoblast in anticipation of the fetal needs. (Naidoo&Bhigjee, 1998)

During pregnancy, brain tumors may increase in size, leading to clinical symptoms. To explain this phenomenon, early authors focused on theories such as accelerated growth rates, vascular engorgement, and increased fluid content of the tumor. These intracranial neoplasms have at times demonstrated

hormone-related growth, with the progression of neurologic symptoms during pregnancy and remission postpartum. Steroid receptors have been identified primarily in meningiomas, with progesterone receptors notably more prominent than estrogen receptors. Ultimately, multiple factors probably play a role in this process. (Elwatidy et al., 2011)

Clinical presentation during pregnancy may be mild in onset or may emerge rapidly, as in our case. Typical presenting symptoms include headache, nausea and vomiting, motor dysfunction, visual disturbances, seizures, loss of consciousness, and incontinence. In the acute presentation, prompt care is imperative to stabilize the mother and ensure fetal well-being before the onset of any further complications such as intracranial hemorrhage or cerebral herniation. (McKenzie et al., 2005)

The symptoms of brain tumors during pregnancy on this patient have been attributed to water retention, engorgement of the vessels, and the effect of progesterone in the appearance and development of brain tumours. Sex hormones occurring during gestation may have a profound effect on tumor growth, recurrence, time of recurrence, and dedifferentiation, worsening the neurological symptoms and harming the mother. (Lynch et al., 2011)

Patients with brain tumors tend to have subacute progressive syndrome and occasionally present with sudden severe neurological signs or symptoms. These cases usually result from hemorrhage into the lesions, nonconvulsive status, and stroke syndromes caused by tumor emboli, endocarditis, or inherent coagulopathies. (Dorai et al., 2010; Tsemenzis, 2000; Yeung 2012) The sudden onset of this patient was thought a cerebrovascular event at early presentation. It could probably be by the presence of a hemorrhagic lesion seen from the Brain CT scan and MRI.

Factors to consider in the initial treatment include the severity of the maternal symptoms, the extent and location of the tumor, the gestational age of the fetus and ultimately, the wishes of the patient. Corticosteroids are usually administered to reduce intracranial inflammation while also protecting against complications associated with fetal prematurity. Dexamethasone has been traditionally used to reduce brain edema. It is safe to use in an acute setting, but its chronic use may be harmful to the fetus as it may cause hypoadrenalism. (El Saayed et al., 2013)

The patient also presented with acute symptomatic seizures. Seizures are a common symptom of a brain tumor, with estimates ranging from 30-50 % of patients. (Yuen et al., 2011) Weighing the risks and benefits of treating seizures with anticonvulsants, it is recommended to use them in this setting to avoid seizures that may lead to maternal and fetal hypoxia and acidosis. (El Saayed et al., 2013) The benefit of anticonvulsants outweighs the risks of teratogenicity, especially when the patient is beyond the first trimester. This patient has been treated with carbamazepine 100 mg every eight hours.

More definitive treatments such as craniotomy, radiation, and chemotherapy must be chosen individually. The benefits and risks to the mother and fetus should be assessed before making treatment decisions. (McKenzie AP et al., 2005)

Treatment should always primarily focus on preserving the mother's life and, secondarily, the energy of the embryo. The surgical decision should be tailored to each patient according to the circumstances. Still, delivery should be performed whenever possible when the fetus weighs 1 kg, calculated by ultrasound, which corresponds to the gestational period between 26^{th} and 30^{th} week. Following this period, there is a 90 % or greater chance of being born healthy. If delivery is performed around the 25^{th} week, the fetus has less than 50 % chance of surviving, and before the 22^{nd} week, only 5 %. (Lynch et al., 2011)

The time of choice for neurosurgical intervention and the delivery will depend on three factors: severity of neurological symptoms, the gestational age of the embryo, and the presumed histology of the tumor. (Lynch et al., 2011)

In 2000, Tewari et al. suggested a management algorithm for symptomatic brain tumors in pregnancy. The algorithm was based on the published information on this topic during the previous 50 years. A woman presenting during the first or early second trimesters of pregnancy whose condition is stable should continue with the pregnancy if she wishes. Neurosurgery or radiotherapy may be considered in the early second trimester. Similarly, a woman who presents in the late second or early third trimesters and is stable should continue with the pregnancy. Antepartum fetal surveillance must be initiated; once fetal maturity is documented the woman should be delivered and appropriate treatment is given (tumor resection, radiation). A woman who has worsening symptoms, manifests new deficits, or has evidence

of increased tumor growth or metastases, may be offered radiotherapy. Delivery should occur once fetal maturity is established, followed by tumor resection. An urgent cesarean delivery under general anesthesia should be accomplished for the woman with acute deterioration or mental status changes, followed by cerebral decompression and tumor resection. (McKenzie AP et al., 2005)

When the diagnosis is made at term, women should be delivered expeditiously and, in the presence of a mass effect, preferably by cesarean under general anesthesia. This would theoretically decrease the risk of cerebral herniation. Vaginal delivery should be reserved for clinically stable women. Avoiding regional anesthesia is prudent due to the dangers of cerebral herniation with the placement of an epidural catheter. Tumor resection may be performed at delivery or in the postpartum period. (McKenzie AP et al., 2005)

The patient was discharged after rehabilitation therapy was conducted three times. But still, her muscle strength was zero. After two weeks of being discharged, she came with better improvement. Her muscle strength was 333 at left lower limbs and 444 at left upper limbs. The remarkable improvement of this patient was due to corticosteroid therapy.

With advances in the medical and surgical treatment of metastatic brain tumors, it is sometimes difficult to predict the life expectancy of patients with the disease. The following factors have been determined to be prognostically favorable in patients with brain metastasis: a high Karnofsky Performance Scale, solitary brain metastases, an absence of systemic metastases, a primary controlled tumor, and a younger age (<60-65 years). (Dorai et al., 2010)

The prognosis of this patient was still unclear since the true etiology of this fit event is still not established. More examinations are still needed. We should conduct repeated Brain MRIs for evaluation and explorations for the primary tumor if it is brain metastasis. The investigations are facing challenges, too, since she is still pregnant, and examinations,e.g., chest x-ray, the abdomen, should be postponed. Brain MRI is scheduled for her sixth month of pregnancy.

IV. Conclusion

1. Brain tumor during pregnancy is extremely rare.
2. Regular physiologic changes associated with pregnancy, combined with pathophysiologic processes unique to pregnancy, predispose women to develop braintumorsduring pregnancy.
3. Corticosteroids in this patient must be given to reduce brain edema.
4. The patient had an unclear prognosis since the true etiology of early-onset seizure in this patient has not been established.

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