The “O” Dilemma: A Case Series on Obstetric Oncological Clinical Vignettes

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Received on: 16 February 2024; Accepted on: 28 May 2024; Published on: XX XXXX XX

ABSTRACT

Background: Pregnancy being an immunocompromised state, when complicated with neoplasm, challenges its management and outcomes. The study aims to find a middle path for optimum maternal, fetal, and oncological outcomes.

Aim and objective: To understand a multidisciplinary approach towards care and management of cancers concomitantly prevalent with pregnancy and their outcomes.

Methodology: An observational retrospective study was conducted at a Tertiary Care Hospital.

Case description: This case series involves multiple cases diagnosed as neoplasms during pregnancy. Brain tumors in pregnancy are extremely rare. Here citing four cases with CNS tumors complicating the natural course of pregnancy. Also, including other tumors like 4 cases of Hematological malignancies during pregnancy.

Conclusion: A multidisciplinary approach paves the way for optimum management of pregnancy with the neoplasm. Each case is unique and desires a new set of management protocols. The cases mentioned below describe the best possible treatment available and provided in various cases of neoplasms complicating pregnancy.

Keywords: Acute myeloid leukemia, Acute promyelocytic leukemia, Brain tumors, Cancers in pregnancy, Chemotherapy, Craniopharyngioma, Hemangioblastoma, Maternal mortality, Medical termination of pregnancy, Meningioma.

Journal of South Asian Federation of Obstetrics and Gynaecology (2024): 10.5005/jp-journals-10006-2458

CASE DESCRIPTION

The Male Child

A 32-year-old, G5P2L2A2, previous two female children, 26 + 3 weeks gestation, un-booked patient, referred to medical emergency services of our hospital with complaints of acute onset altered sensorium with multiple episodes of vomiting, and history of persistent headache since first trimester which remained unevaluated. Detailed neurological examination revealed increased tone in all four limbs and Left eye ptosis with restricted adduction suggestive of 3rd nerve palsy. The provisional clinical diagnosis was cerebral venous thrombosis. Urgent magnetic resonance imaging (MRI) brain revealed extra axial mass lesion of 8.5 × 5 × 5 cm in bilateral basi frontal and parafalcine region with left uncal and subfalcine herniation and obstructive decompensated hydrocephalus s/o Meningioma, as seen in Figure 1. During the course, the patient deteriorated rapidly, and was intubated in view of falling GCS. A multidisciplinary approach was adopted, which concluded the need for operative intervention as a life-saving measure for the mother. Digital subtraction angiography done to look for the central cause of infertility. A 4 × 3.6 × 4.2 cm lesion was seen in the suprasellar region, with calcific areas were present, and the pituitary was seen separately s/o craniopharyngioma as seen in Figure 2. The patient underwent a craniotomy with meningioma excision. Postoperatively, the general condition of the patient poor maintained on mechanical ventilation and iotonic support. In due course, the patient succumbed on post-op day 3. Post-mortem report specified the cause of death as ARDS with cerebral edema and the presence of corpus callosal infarcts.

The Donor Egg

A 27-year-old, primigravida, 28 weeks of gestation, IVF conception (Donor egg), with one twin gestational failure, came to OPD with complaints of blurring of vision. The patient has been under evaluation for primary infertility and secondary amenorrhea since 2019. Underwent laparoscopic cystectomy for serous cystadenoma of the ovary. Hormonal profile-FSH 0.95, AMH-<0.01, s/o hypogonadotropic hypogonadism. Ultrasonography of pelvis s/o unicornuate uterus with no rudimentary horn. Hysterosalpingography (HSG) showed similar findings with the proximal tubal block. Magnetic resonance imaging brain was done to look for the central cause of infertility. A 4 × 3.6 × 4.2 cm lesion was seen in the suprasellar region, with calcific areas were present, and the pituitary was seen separately s/o cranioopharyngioma as seen in Figure 2. The patient underwent a craniotomy and excision of tumor mass. Histopathology report s/o adamantinomatous craniopharyngioma. Follow-up MRI s/o presence of residual disease and was advised radiotherapy treatment. The patient and relatives refused to consent to radiotherapy. In order to conceive, the patient underwent video hysteroscopy with bilateral lateral wall metroplasty.

The patient conceived through the IVF technique with donor eggs in June 2022. In due course of her pregnancy, her vision
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Deteriorated as counting fingers from 3 meters in her right eye and hand movements in her left eye; and was managed conservatively on Tab. Dexamethasone 4 mg thrice a day and Tablet Levetiracetam 500 mg twice a day. The patient improved symptomatically. Regular neuromedicine and neurosurgery opinions were taken. Around 32 weeks of gestation, during regular fetal heart monitoring, the non-stress test showed the presence of persistent variable deceleration. Being a precious pregnancy, a decision for an emergency lower-segment cesarean section was taken. She delivered a healthy female child of 1.335 kgs which was shifted to the Neonatal Intensive Care Unit for further management. The mother was transferred to the Neurosurgery Department and she underwent re-exploration with excision of craniopharyngioma. On post-LSCS day 12 and post re exploration day 5, the patient had a drastic improvement in her vision with 6/36 in the right eye and counting fingers from 6 meters in the left eye. Mother and baby were discharged on day 18 post-LSCS. Breastfeeding continued and the mother is on regular follow-up with the Neurosurgery Department.

Serendipity

A G3P1L1A1, 30-year-old, female at 21 weeks gestation, presents in the Emergency Department with complaints of persistent headache for 15 days, insidious onset, progressive, holocrine predominantly occipital region, radiating to back and neck and not relieved on medications. Fundoscopy examination suggested evidence of papilledema in both eyes. Magnetic resonance imaging brain did suggestive of Intra axial cystic lesion in the right cerebellar hemisphere with post-contrast enhancement of size 3.8 × 3.6 × 3.5 cm with its mass effect as effacement of ipsilateral cerebellar folia and herniation of cerebellar tonsils by 1.3 cm, suggestive of Hemangioblastoma as seen in Figure 3. The patient underwent midline suboccipital craniotomy with excision of the right cerebellar mass and insertion of Torkildsen Shunt. The patient tolerated surgery and anesthesia well. Post-procedure fetal viability confirmed. Histopathology confirmed WHO Grade I Hemangioblastoma. Currently, the Patient is in close follow-up with both neurosurgeons and obstetricians and continuing her pregnancy well.
The Paraplegia
A 32 week antenatal female, G4P3L3, presented to the Emergency Department with complaints of bilateral lower limb weakness with urinary retention for 1 month. Weakness was gradual in onset, progressive in nature, and associated with a tingling sensation. Also, associated with bilateral lower limb swelling (diagnosed to have Deep Vein Thrombosis). No history of loss of consciousness or altered sensorium.

On clinical examination, the patient was alert and conscious. Visual acuity and visual field are normal in both eyes. Extraocular movements are normal. Rest all cranial nerve examinations within normal limits. Power was 5/5 in both upper limbs and 0/5 in bilateral lower limbs. The tone was increased in both lower limbs. No evidence of sensory deficit and no evidence of cerebellar or meningeal signs.

Magnetic resonance imaging spine is suggestive of altered marrow signal at D6 with fatty marrow changes and multiple osteolytic areas, involvement of bilateral Costo-transverse joint. Posterior epidural soft tissue D5D6D7 with craniocaudal extent of 45 mm encroaching into left neural foramina causing compression of exiting nerve roots.

The patient underwent elective lower segment cesarean section after steroid cover. She delivered a healthy male child of 2.3 kg. On day 5 post-LCS, patient was shifted to the Neurosurgery Department for further management. The patient underwent D5, D6, D7 decompressive laminectomy and excision biopsy of the dorsal space-occupying the lesion. Postoperative course uneventful. Both mother and baby were discharged on day 12 post LSCS. A histopathology report is awaited.

The Blast
A G2P1D1 with previous LSCS was referred from a peripheral hospital in view of 34 week ANC mother with multiple fever spikes, tingling sensations in periorbital, perioral regions, and distal extremities, gum hypertrophy, and abnormally raised total leucocyte counts in the range of 31,000; all symptoms started a month back. Hemogram showed Hemoglobin of 8.4 gm/dL; Total leucocyte count of 31,500 cells/microliter and platelet count of 46,000 cells/microliter; Peripheral smear evaluated was suggestive of 87% of blast cells with myeloperoxidase (MPO) positivity, severely hypochromic, normocytic red blood cells and giant platelets. Bone marrow aspiration confirmed the diagnosis as seen in Figure 4. Elective lower segment cesarean section was planned for the patient in view of previous LSCS with a short interconceptional period with maternal need for chemotherapy. About 24 hours post steroid cover given for fetal lung maturation, the patient underwent elective LSCS and delivered a male child of 2.17 kgs. On post-op day 2, the patient was shifted to the oncology care unit for management of AML. The 5 + 2 regimen of induction therapy with cytarabine and doxorubicin started for the mother. Breast milk suppression is given to avoid the ill effects of cytotoxic drugs on the newborn. Risk stratification for AML was done using Fluorescence in situ hybridization studies which revealed the presence of trisomy 8, as a poor marker for response to therapy. The patient was then advised bone marrow transplantation, which was awaited at the time of publication.

The Gum Hyperplasia
A 26-year-old female, primigravida at 7 weeks gestation, came with complaints of fever for 15 days, insidious onset, intermittent nature, high grade, relieved on medications, associated with gum hyperplasia for 15 days as seen in Figure 5. On routine lab studies, 54% of blast cells were identified on peripheral smear which showed MPO positivity. A bone marrow biopsy was done and a diagnosis of
The patient was delivered vaginally and was transfused 47 random donor platelets. 26 fresh frozen plasma, 24 cryoprecipitate, and 7 packed red blood cells. The cytogenetic evaluation revealed translocation t(15;17) PML RARA, 99% transcripts. The patient was started on induction therapy for APML with all-trans retinoic acid (ATRA) and arsenic trioxide (ATO) therapy, along with multiple antibiotic and antifungal cover. Currently, her coagulation profile is within normal limits and she underwent a check curettage in view of incomplete abortion. The patient, follows up with Hematology Department for the continuation of her maintenance therapy. The latest cytogenetic report on 11/09/2023 reveals zero PML RARA transcripts.

Patient is counselled for contraception and opted for non-scalpel vasectomy.

**CASE DISCUSSION**

Cancers in pregnancy, being extremely rare, challenges clinical management. Each case is managed uniquely to give optimum maternal and fetal outcomes. The incidence of neoplasm in pregnancy is about 1 in 1,000 gestations.1 Multiple factors affect the treatment protocols, like, type of cancer, stage of the disease, gestational age at the time of diagnosis, associated maternal comorbidities, and other specifications to particular cancers. The individual case demands a Multidisciplinary approach as it alters the natural course of pregnancy.

Meningiomas are slow-growing, extra-axial tumors, mostly benign, arising from arachnoid. Meningiomas are usually diagnosed incidentally. Studies have shown the presence of progesterone, estrogen, and androgen receptors on meningioma.

2 A desire for a male child, despite two girls, proved dangerous for the mother. Proper use of contraception would have prevented pregnancy and this rapid growth of the tumor. The space-occupying lesion, meningioma, led to uncal herniation, and also, its unusual site made it difficult to operate and remove it in toto. Maternal stabilization was prime even for a 26-weeks pregnancy, hence operative decision was found to be the most suitable option for the mother. However, the associated morbidity led to an adverse maternal and fetal outcome.

Cranioopharyngiomas (CP) are benign tumors, derived from embryonic remnants of the Rathke’s pouch epithelium in the sellar and parasellar region.4 Symptoms are mainly due to compressive effects on the pituitary gland and optic chiasma. Although benign, CP is notorious for being recurrent. Ernst’s desire for a child and to overcome societal obligations, the patient opted for IVF conception, disregarding the need for radiotherapy. However, the odds fell in her place as she delivered a healthy child and immediately postoperatively, her vision improved drastically. These compressive symptoms were managed conservatively during pregnancy.

High doses of daily dexamethasone therapy have many deleterious effects, like increased risk of neurodevelopmental abnormalities, risk of sepsis, and skeletal anomalies in the newborns. Fortunately, none was identified in the newborn during the stay in hospital. Currently, her coagulation profile is within normal limits and she underwent a check curettage in view of incomplete abortion. The patient, follows up with Hematology Department for the continuation of her maintenance therapy. The latest cytogenetic report on 11/09/2023 reveals zero PML RARA transcripts.

Cerebellar hemangioblastomas are extremely rare tumors during pregnancy.6 They can be sporadic or associated with von Hippel Lindau syndrome. There are studies that argue the role of placental growth factors and vascular endothelial growth factor receptors on hemangioblastoma that expedite their growth during pregnancy. A multidisciplinary approach is needed to decide the line of management for such patients. Raised intracranial pressure

![Fig. 5: Gum hyperplasia in a case of acute myeloid leukemia](image-url)
tension with cerebellar tonsil herniation prompts urgent surgical intervention. Gestational age determines whether to undergo a direct surgical procedure (in early gestation) or a shunt procedure (in late gestation). A joint discussion between neurosurgeons, obstetricians, and anesthetists, decided on surgical excision of the tumor, in good faith of the mother and fetus (Table 1).

Although, paraplegia secondary to a cerebral insult are more common, differentials include spinal cord lesions. This rare case of an intradural extramedullary space occupying a lesion (SOL) of the spine, caused severe morbidity in an antenatal mother. The timely decision for cesarean section to expedite decompression surgery at a spinal level to relieve symptoms proved beneficial in the patients care. Differential diagnoses of these SOLs shall be spinal cord lipoma, hemangioma, or meningioma tumor.

Leukemia’s one of the common cancers during pregnancy. Gestational age determines the further management in the case of acute leukemias. In order to start chemotherapy at the earliest, a decision for termination is essential. Chemotherapeutic agents used in the treatment of these leukemias are teratogenic when given during organogenesis.

In the case of acute myeloid leukemia mentioned above, the pregnancy had already crossed the period of viability. Hence, after steroid cover, the decision for termination of pregnancy was taken. Postoperatively, chemotherapy started and the patient was given breast milk suppression to avoid the ill effects of chemotherapeutic agents on the neonate. Owing to the sporadic nature of the disease, the newborn was not subjected to any genetic testing. Contraceptive counseling was done and the couple agreed to use a barrier method till the patient recovers and subsequently use an intrauterine contraceptive device.

In the case of APL, pregnancy warrants special care. The treatment with ATRA (tretinoin) poses a high risk of teratogenicity and risk of birth defects like facial dysmorphism, cleft palate, eye abnormalities, CNS, CVS, and musculoskeletal defects. None was identified in this case scenario. An intrauterine contraceptive device was placed in the immediate postpartum period.

Also, pertaining to the second case of APLM, the patient classically presented in disseminated intravascular coagulation in her first pregnancy and managed wisely.

**CONCLUSION**

Neoplasms in pregnancy, itself being a rare entity, require a high level of clinical acumen to provide satisfactory outcomes. The multidisciplinary approach and obstetrical decisiveness for either the continuation of pregnancy or its termination varies with each case and is of primary benefit to the mother. The morbidity caused may affect the quality of life and mental well-being of the mother, emphasizing a multidisciplinary approach for the same. Adding to the current situation, it jeopardizes a woman’s right to contraception use, partly due to insufficient evidence or due to sociocultural norms.

**ACKNOWLEDGMENT**

The authors would like to extend their gratitude towards all the Departments of KEM Hospital, Mumbai who were directly or indirectly involved in the management of each case. A special mention to Dr. Amey Tule from the Neurosurgery Department at the hospital for providing his valuable insights in each case with brain tumors. Also, a word of gratitude towards Dr. Rakesh R from the Hematology Department for providing us with microscopic images in cases with acute myeloid leukemia.

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