Prognosis is good with most low-complicated by any medical illness, was born neonate 247-247, Seizure disorders might evolve thereafter depending female Most by Case Report children account for 20% of all childhood malignancies. Most cases occur in the first decade of life, with 9 years 1. The annual incidence is approximately 14 per 100,000 children younger than 15 years in the United States. The 5-year survival rates as high as 95-100% without further treatment. Current operative mortality rates are less than 1%. The prognosis, however, is poor for high-grade tumors. The 5-year survival rate is 15-30% for supratentorial lesions and less than 10% for pontine tumors. Seizure disorders might evolve thereafter depending on the astrocytoma site.

Keywords: brain tumors, astrocytoma, childhoodtumours, glioblastomamultiforme

1. Introduction

Brain tumors in children account for 20% of all childhood malignancies. There are considered the most common malignant tumors after acute lymphoblastic leukemia. Most cases occur in the first decade of life, with the peak age at 5-9 years. The annual incidence is approximately 14 per 100,000 children younger than 15 years in the United States.

Astrocytomas have wide clinical manifestation are therefore classified based on location within central nervous system, potentiality of growth rate, invasiveness, morphological features, tendency for progression, and clinical course. The world health organization (WHO) clinicopathologic grades are as follows: pilocytic astrocytoma (WHO grade I), diffuse astrocytoma (WHO grade II), anaplastic astrocytoma (WHO grade III), and glioblastomamultiforme (WHO grade IV) [2].

Indolent low-grade astrocytomas (ie, WHO grade I-II) chiefly found in midline locations, e.g. the cerebellum and diencephalic region. The more malignant high-grade astrocytomas (ie, WHO grade III-IV) predominantly arise in the cerebral hemispheres (i.e. supratentorial) or pontine areas.

Prognosis is good with most low-grade tumors with surgical resection alone is curative. The 5-year survival rates as high as 95-100% without further treatment. Current operative mortality rates are less than 1%. The prognosis, however, is poor for high-grade tumors. The 5-year survival rate is 15-30% for supratentorial lesions and less than 10% for pontine tumors. Seizure disorders might evolve thereafter depending on the astrocytoma site.

2. Case Report

A female neonate was born by emergency lower-segment Caesarian section for non-reassuring cardiotocography at 40 weeks and 10 days to a 36 years old, Para 3+1. The pregnancy was not complicated by any medical illness, neither gestational diabetes mellitus nor hypertensive disorders. The parents are Caucasians and are non-consanguineous. The mother is on no prescribed medications, over the counter medications nor a herbal medicines. She denies tobacco, alcohol and illicit drugs intake. The mother is Blood Group O positive and rubella immune. No history of prolonged membrane rupture or septic factors.

On day one of life, the neonate was post-term (40 weeks+10 days). Appgar was 9 and 10 at 1 and 5 minutes, respectively. The patient was admitted to neonatal intensive care unit for 42 hours. Head circumference was 34 cm (25% centile). Birth weight was 2.78 kg (25% centile). Diagnosis was made as asymmetrical intra-uterine growth regression. Hb level was 15.4 g/dl. Heart rate was 105 beats/minute. Blood pressure was 79/53 with a mean of 50 mmHg. Capillary refill time (CRT) was < 2 seconds. That is normal. She was pink in colour. Cardiovascularly stable. Neurologically stable, eyes opened spontaneously (E=4), sucking normally and crying (V=5), moving all four limbs (M=6), normal posturing (Glasgow coma scale is 15/15). There was no
dysmorphic, no cleft lip nor cleft palate. Soft anterior fontanelle and was not bulging. She was crying. All primitive reflexes are elicited.

On day two of life, she had multiple generalized tonic-clonic seizures and episodes of apnea and desaturating to 60% in room air. The baby was placed in continuous positive airway pressure. She received phenobarbitone and phenytoin. A septic workup was performed. Lumbar tap was performed. Blood and lumbar culture found that no organisms were seen on gram stain and PCR was negative for HSV type 1 and type 2, Enterovirus, Nisseria meningitides DNA, Bacterial 16S rRNA gene. Karyotyping was 46XX. Intravenous antibiotics were empirically commenced, namely benzpyenillin, gentamicin, and cefotaxime. A coagulation screen was done and returned normal. On day three of life, magnetic resonance imaging (MRI) to the brain was conducted. MRI report revealed that there is an extensive parieto-occipital intraparenchymal haemorrhage was found as well as a midline shift. Compression of the left lateral ventricles with left intracalcalcine herniation.

Two weeks later, surgical decompression and craniotomy was performed. The patient was admitted to paediatric intensive care unit thereafter. Tissue was biopsied and sent to the pathology lab for further investigation. Post-operative MRI was done revealing the following: post surgical changes secondary to craniotomy. It is found that there was a large occipital cavity communicating with left lateral ventricle with surrounded oedema. Intraventricular and subdural blood was also found. Small post-operative axial air fluid collection and subgaleal fluid collection were also noted. Phenobobarbitone was given (5mg/kg) for 6/52 to be continued. MRI was repeated in a 6-week period. 3D MRA and 2D MRV have been performed. No abnormalities were found. Histopathological examination confirmed that patient has glioblastomamultiforme (GBM).

Three months later, patient had an MRI showing that a mass lesion at the site of the previous hemorrhage. The patient was admitted electively for craniotomy and debulking of a large parieto-occipital enhancing mass. Patient underwent craniotomy and the left occipital tumor was excised. The patient was on dexamethasone. The patient was postoperatively a bit irritable. A computerized topography revealed a large cavity at the site of excised mass and a small tentorial subdural hematoma in addition to pneumocephalus. A two-week MRI scanning showed a small post-operative pseudomeningocele was noted did not show any evidence of residual tumour.

She stated the first cycle of chemotherapy (Regimen A: vincristine 0.065/kg, IV, taken on day 1 and 4 day and cyclophosphamide 65 mg/kg, IV, taken on day 1. Regimen B: etopsie 6.5 mg/kg, IV, taken on day 3 and day 4 and cisplatin 4 mg/kg, IV, taken on day 1). Regimen A was given for the first two months and regimen B was given in the third month.

3. Discussion

The clinical manifestations of malignant gliomas are dependent upon the location and size of the lesion and are similar to those produced by other primary and metastatic brain tumors [8]. The spectrum of symptoms that malignant gliomas manifest as are: headache, seizures are a presenting symptom in approximately 20% of patients with supratentorial brain tumors [3]. As in our case report, the patient chiefly presented initially with seizures, which was described as generalized tonic-clonic. Other symptoms that present in older patients include memory loss, motor weakness, visual symptoms, language deficit, and cognitive and personality changes. In neonates, the other non-specific symptoms can include: irritability, lethargy, nausea and vomiting, papilledema, and anorexia. Despite extensive clinical trials and recent advances in therapeutic modalities, individual prediction of clinical outcome has remained elusive. The prognosis, therefore, of patients with glioblastomamultiforme (GBM) remains poor.

GBM is considered as the most malignant type of cancer. The overall median survival is less than 1 year [10]. It has been demonstrated that the survival rate, in a series of 279 patients receiving aggressive radiation and chemotherapy, was only 1.8% in a 3-year period. That is, 5 out of 279 patients survived longer than 3 years [10]. The survival time is estimate of GBM could probably be longer than 4 years.

There are certain prognostic factors that affect the response to the undertaken treatment. Accordingly, there is an inter-individual as well as intra-individual variation in response to the assumed therapy, which are all dependent on variety of clinical parameters. The most significant prognostic factors described in the literature are age at presentation, tumour location, tumour grade (GBM has the worst prognosis), and Karnofsky performance status (KPS; it is standard measure of the ability of patients with cancer to perform daily tasks) (Figure 3), as well as extent of initial surgical resection [4, 5, 6, 7].

There is a compelling evidence suggesting that the greater the extent of resection, the more longer the survival for patients with malignant gliomas [8, 9, 10]. Tumours, however, that are labeled as unresectable, e.g., due to their hazardous sites in the brain (e.g., in the brainstem) signifying a poorer prognosis [11].

Patients who are newly diagnosed with a histology-confirmed GBM, nomograms have been devised in order to estimate both median survival and two-year survival probability. Subsequently, it is useful to assist in decision making for individual patients [12]. Normogram was not used for our patient as it was not available.

The malignant gliomas are rapidly progressive brain tumors that are divided into anaplastic gliomas and GBM based on their histologic features [12]. They are best managed with a combined modality approach, initial surgical resection incorporated with adjuvant postoperative radiation therapy and adjuvant postoperative chemotherapy. The initial treatment for malignant gliomas is resection.

The extent of surgery must be balanced with preservation of neurologic function [13, 14, 15]. Various preoperative imaging (e.g., preoperative PET scanning and functional or echo planar magnetic resonant imaging (MRI) and
intraoperative techniques (1) awake craniotomy combining frameless computer-guided stereotaxis with intraoperative cortical stimulation and repetitive neurologic and language assessments as well as (2) specially designed operating rooms that are equipped with computerized tomography (CT) or MRI scanners are being incorporated into patient management to facilitate these goals [16, 17, 18]. The effect on survival of maximal resection is uncertain. Although a number of studies failed to demonstrate a benefit with more extensive surgical resection [19], other reports suggested that maximal resection does lengthen survival [20].

There are many Adjuvant Postoperative Radiation Therapy (RT) techniques that have been described in the literature about the adjuvant postoperative radiation therapy. Whole brain RT (WBRT) was first technique that has been initially reported to be effective in the survival for GBM’s patients. Focal external beam RT, termed involved field RT (IFRT), has replaced WBRT as the standard approach. Some types of involved field RT include 3D-conformal RT, intensity modulated RT, stereotactic radiosurgery (three-dimensional planning techniques), interstitial brachytherapy (placement of radioisotope seeds (most commonly iodine-125), Charged heavy particle RT (helium and neon ions, protons, and neutrons) [11]. The addition of adjuvant WBRT to surgical resection increased median survival from 14 to 36 weeks [22]. Some studies succeeded to show that adequate doses of RT are required to maximize the survival benefit [23].

The effect on survival of maximal resection is uncertain. Although a number of studies failed to demonstrate a benefit with more extensive surgical resection [24], other reports suggested that maximal resection does lengthen survival [25, 26].Temozolomide (TMZ): The benefit of adjuvant treatment with TMZ (as combination of TMZ and RT) was demonstrated in a phase III trial [27]. In this study, patients who whose age is less that less than 50 years old, the five-year survival was 17 percent. Bevacizumab (BV): It is a monoclonal antibody that binds vascular endothelial growth factor (VEGF), which plays a critical role in the development of the abnormal vasculature observed in GBM. In a phase II study, patients who were treated with BV and TMZ during and after RT showed improved progression-free survival (=13.6 months) [28]. The survival benefit was shown unequivocally in a meta-analysis comparing RT alone or with chemotherapy [29]. Chemotherapy was associated with a 15 percent decrease in the risk of death (hazard ratio (HR) 0.85, 95% CI 0.78 to 0.91), which translated to a 6 percent absolute increase in one-year survival (from 40 to 46 percent) and a two-month improvement in median survival.

Guidelines from the National Comprehensive Cancer Network (NCCN) recommend that a repeat MRI should be obtained in patients with a malignant glioma about two to six weeks after completion of radiation therapy, then every two to four months for two to three years, and less frequently thereafter [30].

Reviewing the current literature, we would propose a treatment plan for this patient as follows. This patient shall start with an initial BV (10 mg/kg every two weeks) in combination with a standard regimen RT (60 Gy in daily 30 fractions) with concomitant TMZ (75 mg/m2 daily up to 49 days) followed by up to six cycles of adjuvant TMZ (150 to 200 mg/m2 daily for five days, every 28 days) [31]. This protocol has been widely used so far [31]. This could not be asesses because the patient have not yet underwent her chemoradiotherapy.

References


