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CASE REPORT

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Prenatal diagnosis of a fetal intracranial tumor

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Abstract *Introduction*: The commonest fetal intracranial tumor is the teratoma. The prognosis is poor with death usually occurring shortly after birth. Modern high resolution ultrasound scanners facilitate examination of the cranial contents, allowing earlier diagnosis. *Case report*: A fetus with a congenital intracranial teratoma presenting with a disproportionately enlarged head at 36 weeks' gestation is presented. The infant died of respiratory failure within 24 h of birth. On postmortem examination the histologic report revealed an immature teratoma. *Summary*: This article describes the prenatal sonographic diagnosis of a rare case of intracranial immature teratoma in a fetus at 36 weeks' gestation.

Keywords Intracranial teratoma · Ultrasonography

Introduction

Childhood intracranial tumors are rare. Only about 5% arise during fetal life and usually indicate a poor prognosis [1]. The diagnosis is generally made by ultrasonography in fetal life. Ultrasound diagnosis of fetal brain tumors is possible, when intracranial masses disrupt the normal architecture with or without hydrocephalus. Depending on the variety of congenital tumors, ultrasonic appearance can change from uniform solid or cystic lesions with well-defined borders to complete inhomogeneous tumors with irregular borders. Teratoma is the most common tumor in the neonatal period, representing one-third to one-half of all tumors [2, 3]. Transvaginal ultrasonography and MR imaging have recently been employed to improve the imaging of fetal intracranial structures and abnormalities [1, 4]. Neonatal brain biopsy is still necessary to assign a definitive diagnosis. We report a patient diagnosed prenatally as having an enlarging intracranial mass that proved to be a immature teratoma.

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Case report

This 25-year-old primigravida was referred to our hospital at the 36th week of gestation for delivery. Ultrasound examinations were done in emergency condition. She had no prior ultrasonographic examination. Ultrasonography showed intracerebral midline mass of 17×14 cm. Additionally, ventriculomegaly with dilatation of lateral ventricles and third ventricle was found.

The tumor showed a primarily solid homogeneous echogenic structure with some loculated low echogenic or cystic structures within it. The mass was placed at the midline of the brain, extending from the suprasellar region to the skull, and from the frontal to the occipital region, limited here and on the parietal side by massively dilated lateral ventricles. The borders of the tumor were well defined (Fig. 1).

Fetal swallowing and activity were normal. Additional malformations were excluded, and amniotic fluid index was normal. Labor was done in emergency conditions with cesarean section since the breach presentation and extremely large fetal cranium. A 4,300-g female fetus were delivered with 5 APGAR score. She died in the following hours because of respiratory distress. The postmortem examination was performed in the pathology department (Figs. 2, 3). The diagnosis was immature teratoma after microscopic examination.

Discussion

Brain tumors are exceedingly rare in children, and only about 5% arise during fetal life [1]. Data from the

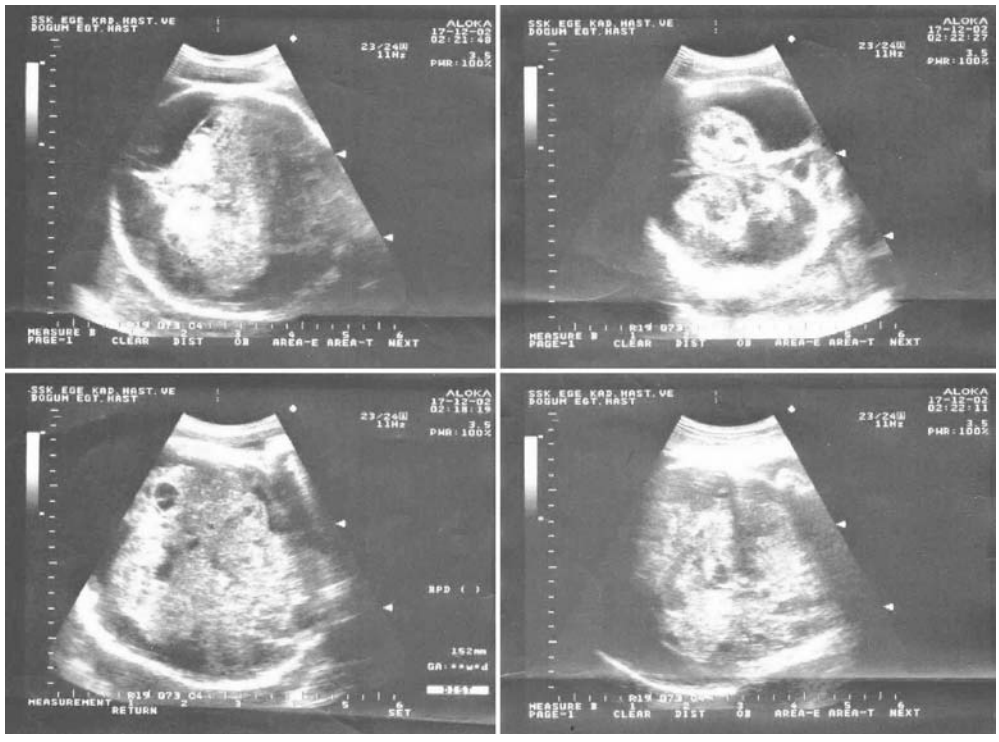

Fig. 1 Sonographic picture of fetal cranium with an intracranial teratoma

National Cancer Institute's Surveillance Epidemiology and End Results program suggest that the incidence of these tumors has increased during the past 20 years [3]. Teratomas are the most frequent intracranial tumors found in the neonate, with meningeal sarcoma, craniopharyngioma, lipoma of the corpus callosum, and oligodendroglioma being found less commonly [3, 5]. Most are located in the pineal region, but about 20% are located in the suprasellar or infrasellar regions [3, 5, 6]. Histologically they are classified as mature, immature, or teratoma with malignant components based on the amount of tissue differentiation [7]. They contain structures derived from all three germ cell layers. Immature teratomas may also contain primitive neural tissue.

A brain tumor should be suspected in the presence of mass-occupying solid or cystic lesions, and a change in shape or size of the normal anatomic structures (such as shift in the mid-line). Cystic tumors and teratomas are usually characterized by complete loss of the normal intracranial architecture. In some cases, the lesion appears as a low echogenic structure, and it may be difficult to recognize. Hydrocephalus is frequently associated with brain tumors and may be the presenting sign. In our case tumor showed a primarily solid homogeneous echogenic structure with some loculated low echogenic or cystic structures within it. There were also massive

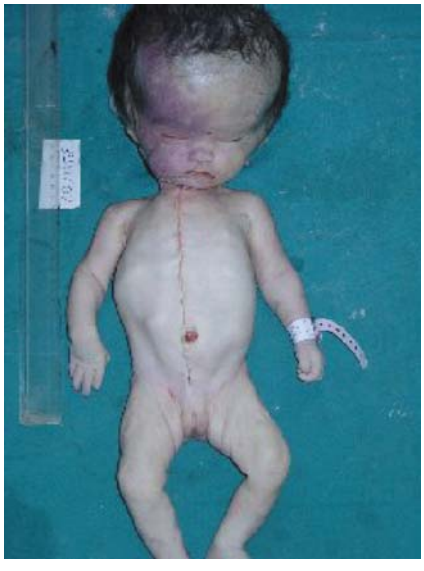

Fig. 2 Macroscopic picture of enlarged cranium

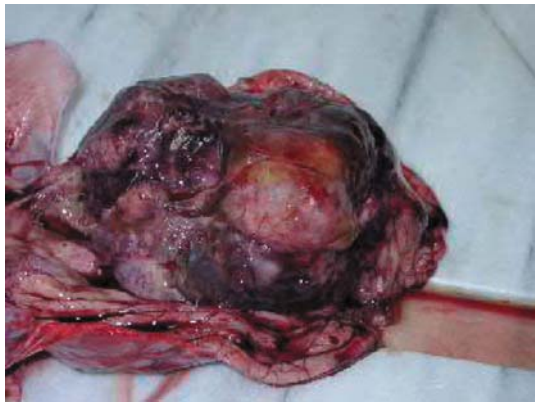

Fig. 3 Macroscopic specimen of intracranial teratoma

hydrocephalus. The ultrasound appearances of all intracranial tumors are similar and, therefore, precise histological diagnosis from a scan is almost impossible. Possible exceptions are lipomas (that have a typical hyperechogenic homogeneous appearance) and choroid plexus papillomas (that appear as an overgrowth of the choroid plexus) [7, 8]. There were no uniform hyperechogenic structure and choroid plexus overgrowth in our case. Identification of brain neoplasm associated with tuberous sclerosis, neurofibromatosis, and systemic angiomatosis of the central nervous system and eye can be attempted in patients at high risk; in most cases, however, antenatal sonography is negative, at least in the second trimester [6, 8]. There were no family history of our case to put into high risk group for intracranial tumors.

Teratomas are usually associated with calcifications. In ultrasonographic examination our case had no calcification. Most of the times polyhydramnios and rarely pulmonary hypoplasia and high cardiac output failure may associate intracranial tumors [3]. In our case amniotic fluid index was normal and there were no associated abnormal findings in other side of the body.

Prenatal detection of precise histologic type of the tumor is impossible, because sonographic appearances of different tumors are similar. The location, size and the behavior of the tumor throughout the pregnancy, due to its rapid growth as well as increasing ventriculomegaly, may lead to preterm delivery or to the decision of the parents to terminate the pregnancy before viability.

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