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Case Report

Multidisciplinary examination for prenatal diagnosis of posterior cervical teratoma in early second trimester

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Abstract

Objective: Cervical teratomas represent approximately 3% of all congenital teratomas, which occur in approximately 1 in 20,000–40,000 live births. In this report, we present a case of congenital posterior cervical teratoma diagnosed by a two-dimensional (2D) ultrasound in the early second trimester.

Case Report: A 28-year-old woman, gravid 1, para 0, came to our prenatal clinic at 20 weeks of gestation for her first prenatal visit. Results of an ultrasound revealed a fetus with multiple cystic septal mass with internally calcified spots measuring approximately 3 cm over the left fetal neck. Because no other abnormality was noted at that time, magnetic resonance imaging (MRI) and amniocentesis were scheduled on the following day. At the same time, results of a 4D ultrasound revealed the mass size to be same as that measured by the 2D ultrasound; however, the location was defined on the left posterior neck and MRI showed there was no invasion to the intracranial area. The parents opted to continue the pregnancy. In the following prenatal cares, no polyhydramnios was found and the fetal body weight was within the normal growth curve. The baby was delivered by cesarean section at 38 weeks of gestation with Apgar scores of 8 (at 1 minute) and 9 (at 5 minutes). The baby was scheduled for surgical intervention 3 days after birth. Finally, results of a pathological analysis revealed the mass to be a benign cystic teratoma.

Conclusion: Prenatal diagnosis of cervical teratoma is very crucial, allowing early detection of masses that obstruct the airway. Therefore, a multidisciplinary examination and follow-up are recommended for early prenatal diagnosis.

Keywords: cervical teratoma; four-dimensional ultrasound; magnetic resonance imaging; prenatal diagnosis

Introduction

Congenital cystic lesions of the neck are uncommon and often manifest as slow growing masses and show symptoms only after enlarging sufficiently or after infection [1]. Malignancy change was relative rare and always presented in distinctive image presentation [2]. Cervical teratomas represent approximately 3% of all congenital teratomas, which occur in approximately 1/20,000–40,000 live births [3]. Teratomas are derived from all the three germ cell layers (i.e., the ectoderm, the mesoderm, and the endoderm). The primordial germ cells migrate from the yolk sac to genital ridges during 4^{th}–6^{th} week of gestation. The germ cells are then incorporated into the primitive sex cord to form the gonads. The unincorporated cells normally involute. However, a continued division of these unincorporated pluripotent cells gives rise to teratomas. Head and neck are second most common locations for teratomas after the sacrococcygeal area. In the head and neck region, teratomas are most commonly found in the cervical area, followed by the nasopharynx. Tumors detected before birth are usually large and may be associated with polyhydramnios, hydrops, or premature delivery. The fetus head is often held in hyperextension position

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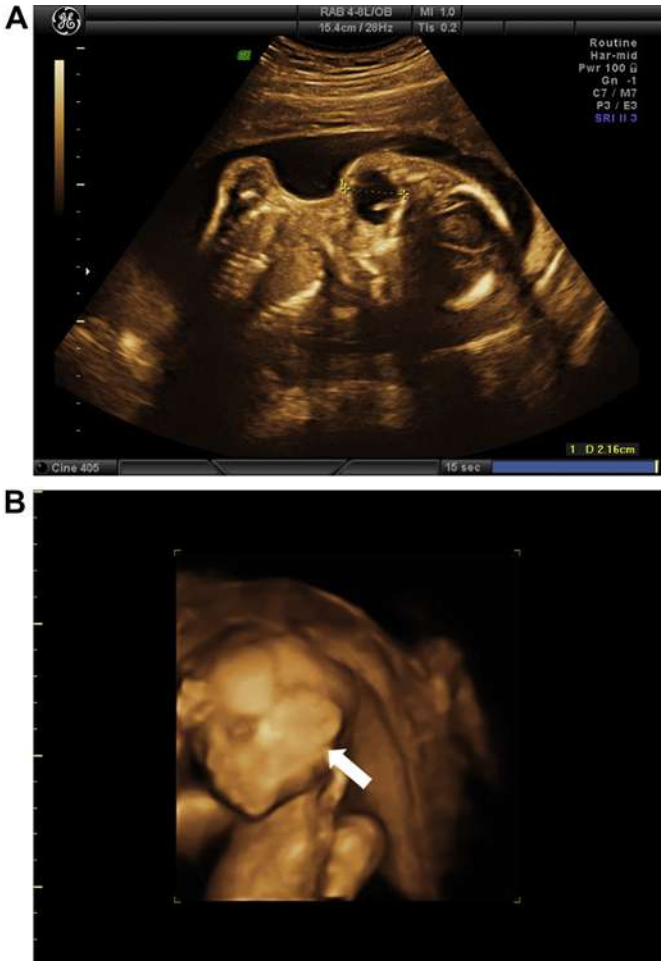

Fig. 1. (A) Two-dimensional image (2D) at 21 weeks of gestation shows a multiple cystic septal mass with internally calcified spots measuring approximately 21.6 × 26.3 mm^2 over the left fetal neck. (B) A 4D ultrasound scan showed the location of the tumor to be the left posterior neck (white arrow).

or is deviated sideways. Malignant change and metastasis can occur as a rare event. It could be critical if the tumor obstructs the airway with an intrauterine presentation (polyhydramnios, hydrops, or premature delivery). In this report, we present the case of congenital posterior cervical teratoma, which was diagnosed by a two-dimensional (2D) ultrasound in the early second trimester.

Case report

A 28-year-old, gravida 1, para 0, woman came to our prenatal clinic at 20 weeks of gestation for her first prenatal visit. Her previous obstetric history and family history were unremarkable. At our clinic, we performed a routine prenatal ultrasound scan for assessing the basic biometry and the nuchal thickness. Results of the scan revealed a fetus with multiple cystic septal mass with internally calcified spots measuring 21.6 × 26.3 mm^2 over the left fetal neck (Fig. 1A). Because no other abnormality was noted at that time, an amniocentesis was scheduled on the following day. At the same time, results of a 4D ultrasound revealed the mass size to be same as that measured by the 2D ultrasound; however, the location was defined on the left posterior neck. Results of amniocentesis revealed a karyotype of 46,XX. The parents opted to continue the pregnancy. We had also arranged a fetal magnetic resonance imaging (MRI) scan, which illustrated a large heterogeneous mass at the left side of the fetal neck with T2W image (Fig. 2A and B). In the following prenatal cares, a serial sonography examination showed no polyhydramnios and the fetal body weight was within the normal growth curve; however, there was an increase in the size of the cystic mass, which now measured 5 cm. The baby was delivered by cesarean section at 38 weeks and 3 days of gestation with Apgar scores of 8 (at 1 minute) and 9 (at 5 minutes) (Fig. 3). After discussing the situation with a pediatric surgeon, the baby was scheduled for a neonatal MRI evaluation and a surgical intervention was planned 3 days after birth. Finally, results of the pathological analysis revealed the mass to be a benign cystic teratoma (Fig. 4).

Discussion

An undiagnosed teratoma may induce fetal birth injury [4]. Usually, a prenatal diagnosis using a 2D ultrasonography after the 15th week of gestation shows a large heterogeneous mass in the

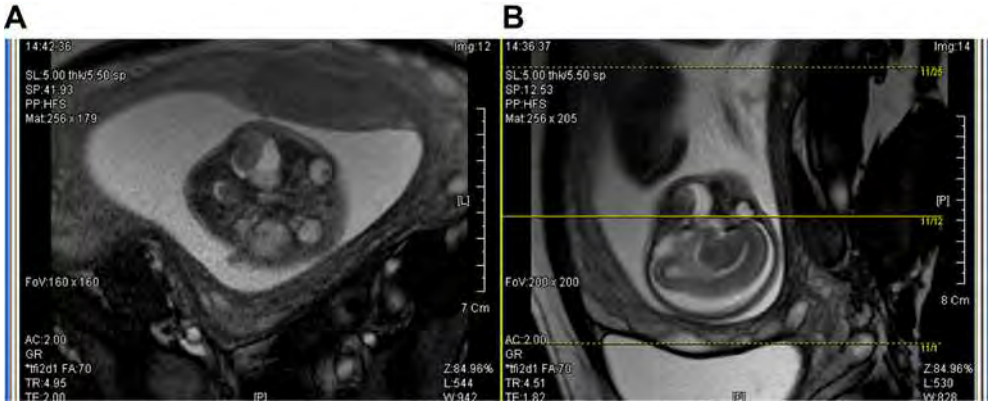

Fig. 2. Fetal magnetic resonance imaging. T2-weighted images in the (A) axial and (B) coronal planes show a large heterogeneous mass on the left side of the fetal neck and the extra-cranial area (above the yellow line).

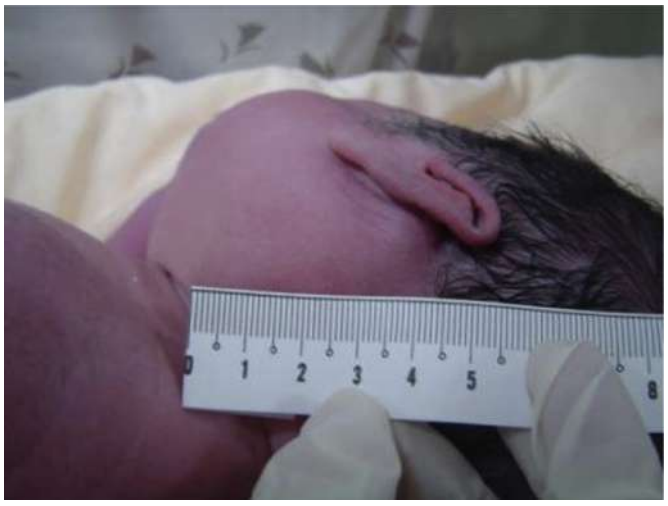

Fig. 3. Grossly, the neck mass measured approximately 4.3 × 4 × 3 cm^3. When the mass was cut, adipose tissue, cartilage, and bony parts are found.

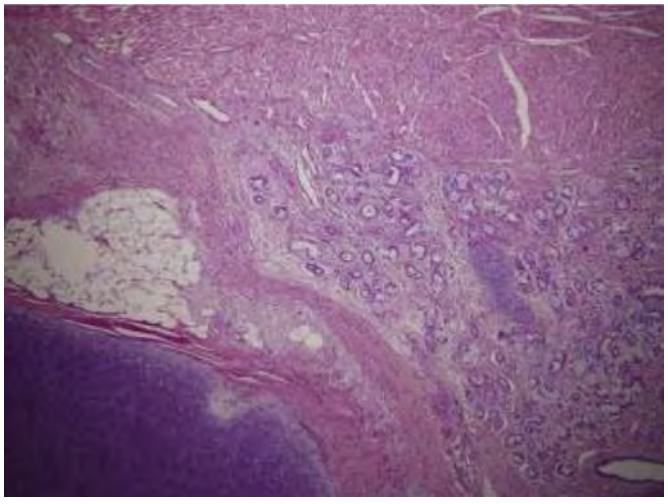

Fig. 4. The tumor is composed of mature somatic tissue derived from all the three germ cell layers including skin and its appendages, fat, smooth muscles, cartilage, bone, neural, and gastrointestinal tissues. No evidence of immaturity or malignancy in any of the components is noted.

cervical region, plus polyhydramnios, and an ultrasonography on the Doppler mode will show the tumor vascularization. The prognosis depends mainly on the size and location of the lesion, the tumor growth rate, and the level of tracheal compression [5]. However, in our case, no polyhydramnios and tumor vascularization by the 2D and color Doppler ultrasound were detected. Therefore, we speculated there was no obstruction of the airway and the esophagus. Prenatal diagnosis of cervical teratoma is very crucial, which allows for early detection of masses that obstruct the airway. A systemic review reported that a 3D ultrasound and an MRI may enhance the accuracy of the antenatal diagnosis (location, extension, and intracranial spread) and may aid in the selection of patients requiring treatment [6]. In this case, the tumor mass did not spread to the intracranial regions, as suggested by fetal MRI. The ultrasonographic findings of cervical teratomas are (1) predominately solid or mixed cystic/solid mass, (2) calcifi cations are virtually pathognomonic of teratoma, (3) head is often held in hyperextension position, (4) polyhydramnios resulting from upper esophageal obstruction, and (5) a color Doppler ultrasound over solid portions shows high vascularization of the tumor. Fetal MRI is an important adjunct to antenatal imaging especially when neonatal surgery is contemplated [6]. In our case, we performed multidisciplinary examinations such as 2D, 4D ultrasound, amniocentesis, and fetal MRI for prenatal diagnosis and genetic counseling after birth. Of course, repeated neonatal MRI should be scheduled before surgery. The differential diagnosis of cervical teratoma including epignathus, cystic hygroma, goiter, or other rare soft tissue tumors such as hemangioma, fibromatosis, fibrosarcoma, rhabdomyosarcoma [7] should be ruled out. Prenatal karyotype and searching for associated abnormalities are mandatory in all teratomas. In this case, the karyotyping turned out to be normal. Besides, the delivery should involve elective cesarean section with *ex utero* intrapartum treatment procedure or resection of the tumor mass, which may be performed on a placental support operation based on the placental support procedure to increase the chances of postnatal survival [8]. An early surgical approach to congenital cervical teratomas provides the best final results, with lower rates of complication and recurrence. Early consultation with pediatric surgeons for intervention and advanced organization of planning for resuscitative efforts are very important. Finally, a multidisciplinary examination and follow-up are recommended for early diagnosis, surgical excision, and follow-up. All of these experiences benefit us by increasing our knowledge to help us with genetic counseling and prenatal diagnoses.

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