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BRIEF COMMUNICATION

Prenatal Sonographic and MRI Assessment of Early Fetal Neck Immature Teratoma

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Abstract We report a case of a pregnancy involving a fetal neck mass which was diagnosed at 19 weeks of gestation. Three dimensional ultrasound provided detailed additional information about the extent of the lesion and the areas of involvement. Color Doppler revealed intense vascularity within the lesion, with both arterial and venous flow. Fetal MRI revealed the exact extent of the lesion along with deep seated structures involved. Diffusion weighted images revealed restricted diffusion with low ADC values suggesting a mitotic etiology. The patient along with her husband decided to abort the fetus. An infantogram of the abortus was taken. Histopathology and immunohistochemistry was performed. The final diagnosis was immature teratoma.

Keywords Fetal neck mass · Immature teratoma in fetal neck · Antenatal ultrasound in fetalneck mass · Fetal MRI

Introduction

Cervical masses in the fetus present a challenge in the antenatal, intrapartum and postpartum period. The common differential diagnoses include teratoma, neuroblastoma, cystic hygroma, dermoid cyst, hemangioma, lymphangioma, epignathus, cervical meningocoele, thyroglossal duct cyst and esophageal diverticulum.

Cervical teratomas in the fetus are rare. They have an incidence of 1 in 20,000–40,000 live births and account for about 6% of all fetal teratomas [1–4]. Airway obstruction in the newborn because of tracheal compression or occlusion has been reported as the cause of an 80–100% mortality rate in untreated cervical teratomas in the neonatal period [5, 6]. Neonatal survival depends on the size and extent of the involved tissues and respiratory compromise is the major cause of subsequent morbidity and mortality. Prenatal diagnosis is usually based upon the findings of a solid and cystic mass usually in the anterolateral aspect of the fetal neck extending across the midline [7].

We report a case of antenatally diagnosed fetal neck teratoma where the fetus was eventually aborted.

The present case to our knowledge is one of the earliest diagnosed antenatal fetal neck masses.

Case report

A 23 year old primigravida was referred to our department for a detailed anomaly scan at 19 weeks gestation. Ultrasound examination revealed an appropriate for gestational age fetus with normal amniotic fluid.

There was a large postero-lateral neck mass of 4.5 × 4.3 × 4.1 cms with a predominant solid component. Internal cystic areas with foci of calcification were seen. The mass was seen to extend from the level of the occipital bone to the level of the clavicle. On color doppler, the lesion showed internal & peripheral vascularity with both arterial and venous flow and low resistance indices, indicating a vascularized tumor (Fig. 1a, b). The trachea and the esophagus were patent and the stomach bubble was visible.

Fetal MRI revealed a large solid mass along the postero-lateral aspect of the fetal neck. The lesion was seen to arise from the right parapharyngeal space and was seen to lie in

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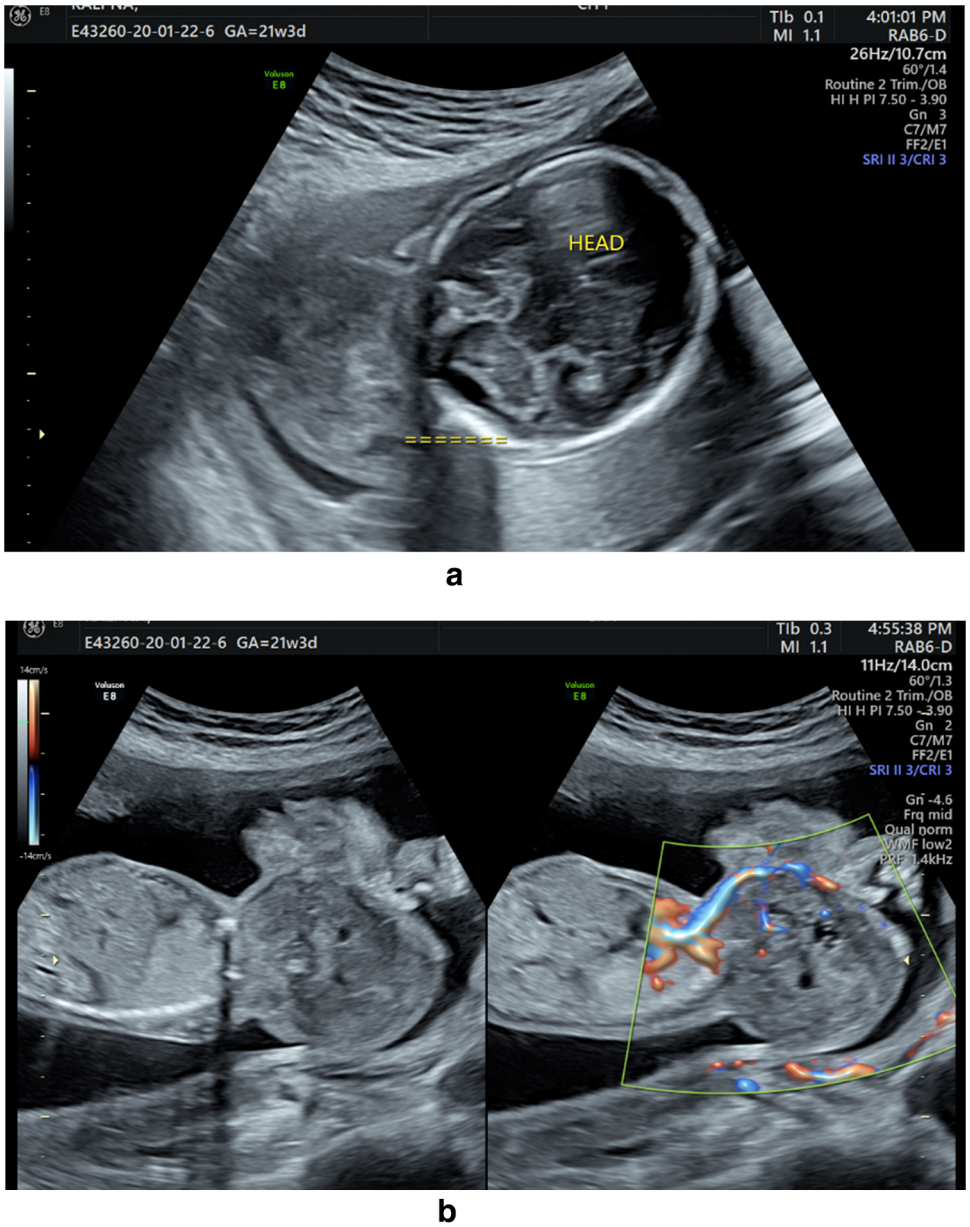


Fig. 1 **a** Ultrasound scan showed a large, fairly well defined, heteroechoic lesion along the postero-lateral aspect of neck of the fetus **b** On Color Doppler, the lesion showed vascularity along with multiple cysts and calcified foci

close proximity to the carotid vessels, parotid and submandibular gland. It was seen to compress the oropharynx and the upper part of esophagus. The lesion showed restricted diffusion on DW images with associated low ADC values (Fig. 2a, b).

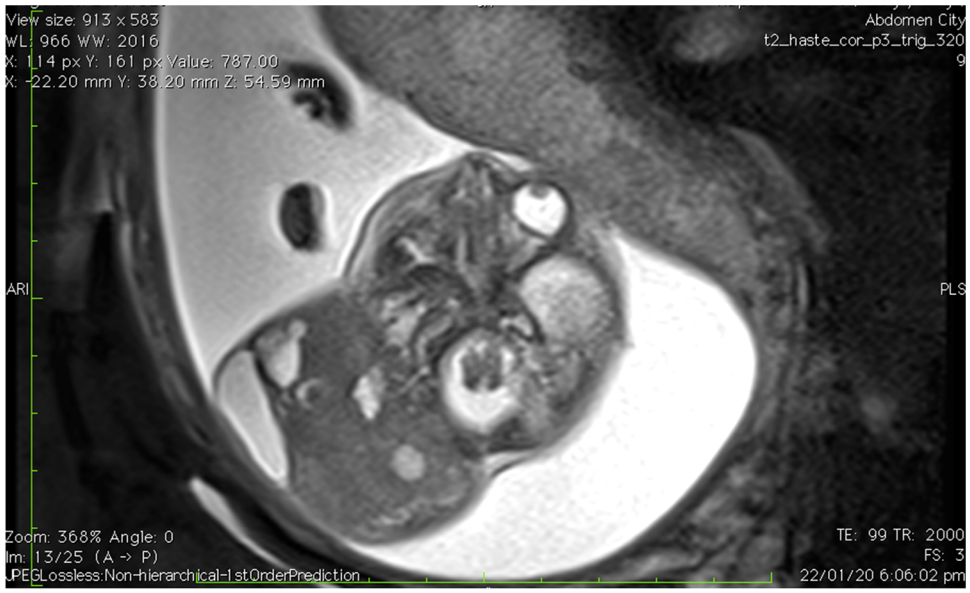
A provisional diagnosis of cervical teratoma was made. Due to the large antenatal mass at an early gestational age, the parents elected to terminate the pregnancy.

The aborted fetus revealed a 5 × 4.5 × 4 cms cervical mass occupying the postero-lateral aspect of the right side of neck.

Post termination infantogram was performed, which demonstrated the extent of the lesion (Fig. 3a, b).

On histopathology, sections showed tumor tissue composed of immature neuroepithelium arranged in diffuse sheets, at places forming multilayered rossettes with luminal neurofibrils. Tumor cells are round, with high nucleo-cytoplasmic ratio, hyperchromatic nuclei showing coarse chromatin and inconspicuous nucleoli (Fig. 4).

A diagnosis of round cell tumor with predominant immature neuroepithelial element, was made. On IHC, GFAP and CD 99 positivity was noted, supporting the final diagnosis of Immature teratoma with extensive primitive neuroepithelial element.



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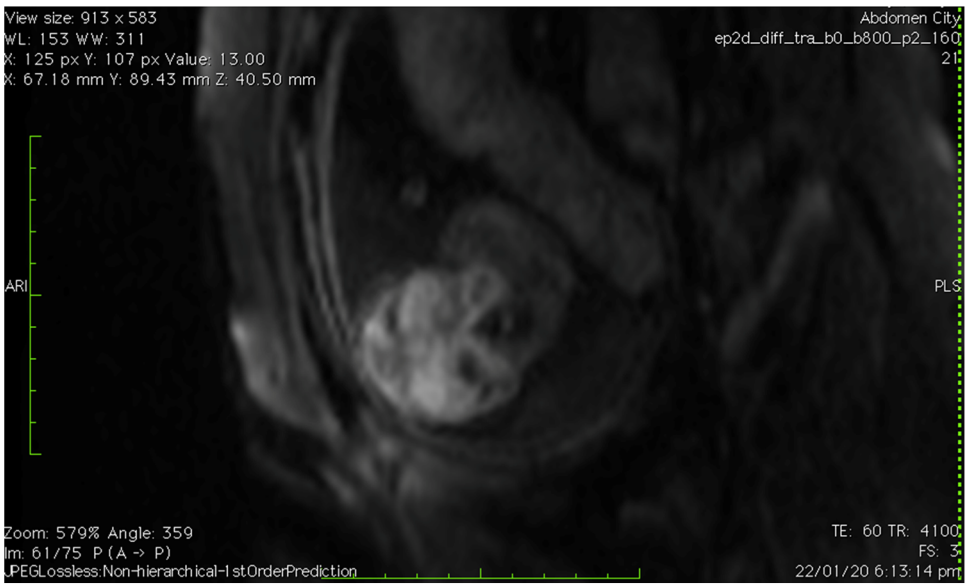

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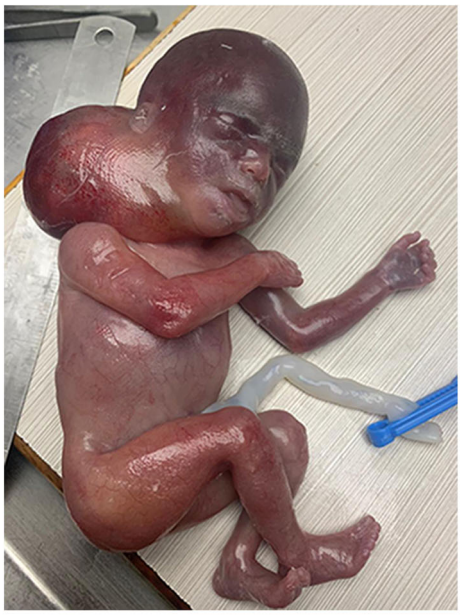
Fig. 2 **a** Axial T2 weighted image of fetal MRI shows deep extension of the lesion. **b** Diffusion weighted image shows restricted diffusion, suggestive of mitotic etiology

Discussion

With a reported incidence of 1 in 20,000–40,000 live births, teratomas are the most common congenital tumor [1–4, 8]. They occur in different parts of the fetal body. About 40% of fetal teratomas are sacrococcygeal and the second most common is intracranial. About 5% of fetal teratomas are situated in the lateral and anterior cervical region [9, 10] Fetal teratomas consist of ectodermal, endodermal and mesodermal germ cell tissue which includes central nervous tissue.

Both mature and immature teratomas are distinguished by the degree of differentiation of tissues. Usually fetal cervical teratomas are considered benign. However, their malignant transformation can also occur and has been reported in the literature [5]. Magnetic resonance has also been described as providing essential information about the diagnosis and the anatomy of giant fetal neck masses and the adjacent airway [11].

In contrast to our report, most of the cases reported in literature have been diagnosed in the late second and third trimester of pregnancy [5, 7, 12–14].



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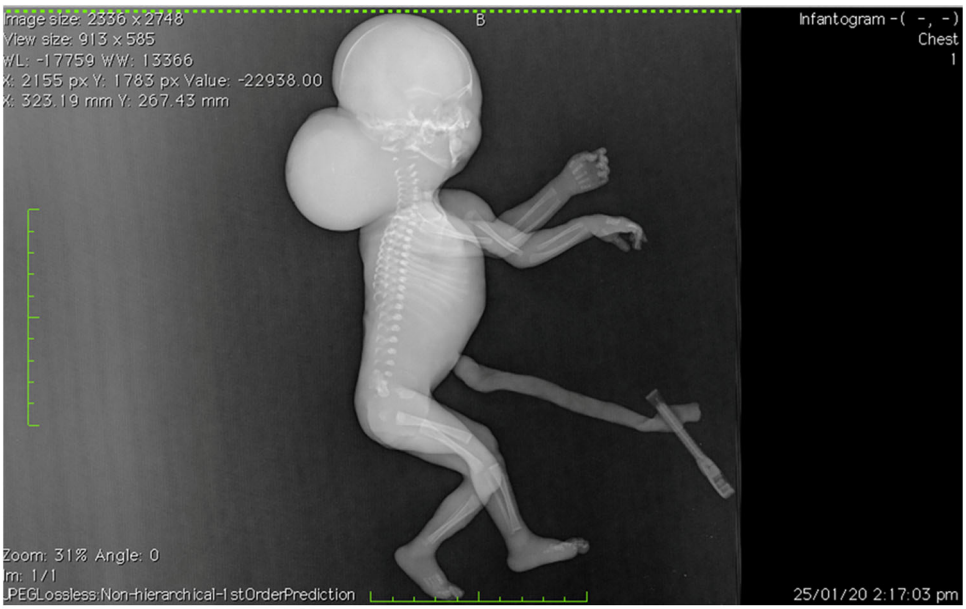

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Fig. 3 The abortus **(a)** and infantogram **(b)** confirmed the imaging findings

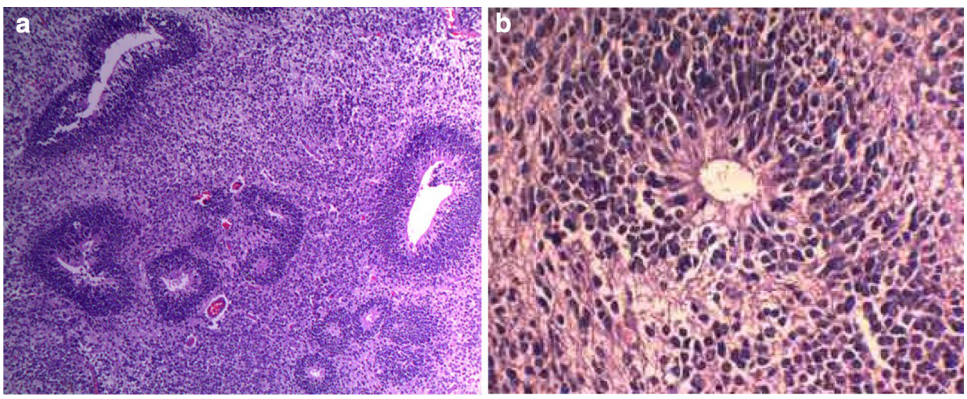

Fig. 4 Tumor cells forming rossettes with neurofibrillary lumen

Sherer et al. reported a case of cervical teratoma at 18 weeks gestation with subsequent termination of pregnancy [15].

Conclusion

The prenatal diagnosis of these tumors is of clinical importance. The prognosis is poor as 50% cases die in utero and 50% of those born alive die within few hours due to respiratory complications [16, 17]. Both ultrasound and fetal MRI play a vital role in the assessment and detailed evaluation of an antenatal neck mass.

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