Case Reports in Women's Health 22 (2019) e00121

Contents lists available at ScienceDirect

Case Reports in Women's Health

journal homepage: www.elsevier.com/locate/crwh

The differential diagnosis of fetal facial tumors: A case report of a neonatal granular cell tumor (GCT)

Ammar Al Naimi *, Stephan Spahn, Franz Bahlmann

Department of Obstetrics and Gynecology, Buergerhospital Frankfurt, Germany

ARTICLE INFO

Article history:
Received 31 March 2019
Received in revised form 29 April 2019
Accepted 1 May 2019

Keywords:
Fetal facial tumors
Granular cell tumor
Neonatal GCT

ABSTRACT

Cranio-cervico-facial tumors are rare. While ultrasound is the gold-standard method for diagnosing these anomalies, three-dimensional ultrasound and prenatal magnetic resonance imaging are complementary tools for reaching a precise diagnosis. Hemangiomas, meningoceles, proboscis lateralis, skin appendages and other fetal tumors are the main differential diagnoses. The prenatally assumed diagnosis of these malformations can change postnatally, with the ready identifcation of additional clinical features. We present a case of prenatally suspected proboscis lateralis. This diagnosis was revised postnatally to a facial hemangioma. The tumor did not regress with β-blocker therapy for 5 months, and so a biopsy was then performed, which showed it was a granular cell tumor (GCT). This was later successfully excised, with clear margins. This case is important because there has been only one reported case of neonatal GCT, and because it shows that even with technologically advanced prenatal diagnostic methods, reaching the correct diagnosis can still be challenging.

1. Introduction

Cranio-cervico-facial tumors are rare, and so few cases will be diagnosed in a single centre. There are several additional factors that affect the sensitivity of prenatal diagnosis of these malformations, such as the changes of the fetal face throughout pregnancy, fetal position, anterior wall placenta, and the requirement for two-dimensional (2D) ultrasound images to be interpreted as a three-dimensional (3D) construct when 3D ultrasound is not available. Nevertheless, in the hands of an experienced physician, ultrasound remains the perfect tool for diagnosing cranio-cervico-facial malformations [1].

2. Case

A 30-year-old Caucasian woman with a body mass index of 19 kg/m^2 was referred in the 34th gestational week in order to clarify an abnormal growth near the fetal nose. The medical history included a miscarriage in the 10th week of a previous pregnancy, normal non-invasive prenatal testing in the 14th week of the present gestation and a normal ultrasound scan in the 21st gestational week. Ultrasound confirmed the presence of a round, tumor-like structure, 16 mm in diameter, between the nasal root and the left eye. This tumor was vascularized, as could be demonstrated with low pulse repetition frequency (PRF), and a connection between it and the cranium could not be ruled out. According to the ultrasound findings (Fig. 1), the differential diagnosis was limited to hemangioma, meningocele, proboscis lateralis, or a skin appendage.

Magnetic resonance imaging (MRI) (Fig. 2) was performed to further limit the differential diagnosis. The MRI report stated that the cranium was morphologically normal and without any connection to the tumor. In addition, amniotic fluid could be demonstrated only in the right nasal canal and therefore the tumor was suspected to be a proboscis lateralis with deformation of the left nasal canal.

The neonate's parents were appropriately counseled and prepared for several possibilities regarding postnatal management. During the course of the pregnancy, the size of the tumor remained constant, without significant growth, and a planned caesarean section was performed close to term, as per the wish of the mother-to-be. The healthy female newborn had a soft, round, left-sided, red tumor at the base of the nose; the tumor had a velvety surface and a diameter of 20 mm. Postnatal ultrasound showed a vascularized tumor and the postnatal MRI showed that the tumor infiltrated the subcutaneous tissue without involving the orbit or the nasal canal. This tumor was clinically diagnosed as a hemangioma and treated accordingly, with propranolol. Even after five months of treatment with the β-blocker, the tumor showed no regression and even developed an atypical hair growth pattern, and so a biopsy was performed. The biopsy showed that the tumor was a granular cell tumor (GCT), which was subsequently excised (Fig. 3). The final histology report confirmed the tumor as a GCT with adequate free margins. Regular follow-ups were planned.

* Corresponding author at: Department of Obstetrics and Gynaecology, Buergerhospital – Dr. Senckenbergische Stiftung, Nibelungenallee 37-41, 60318 Frankfurt am Main, Germany.
E-mail address: ammar.alnaimi@uclmail.net (A. Al Naimi).

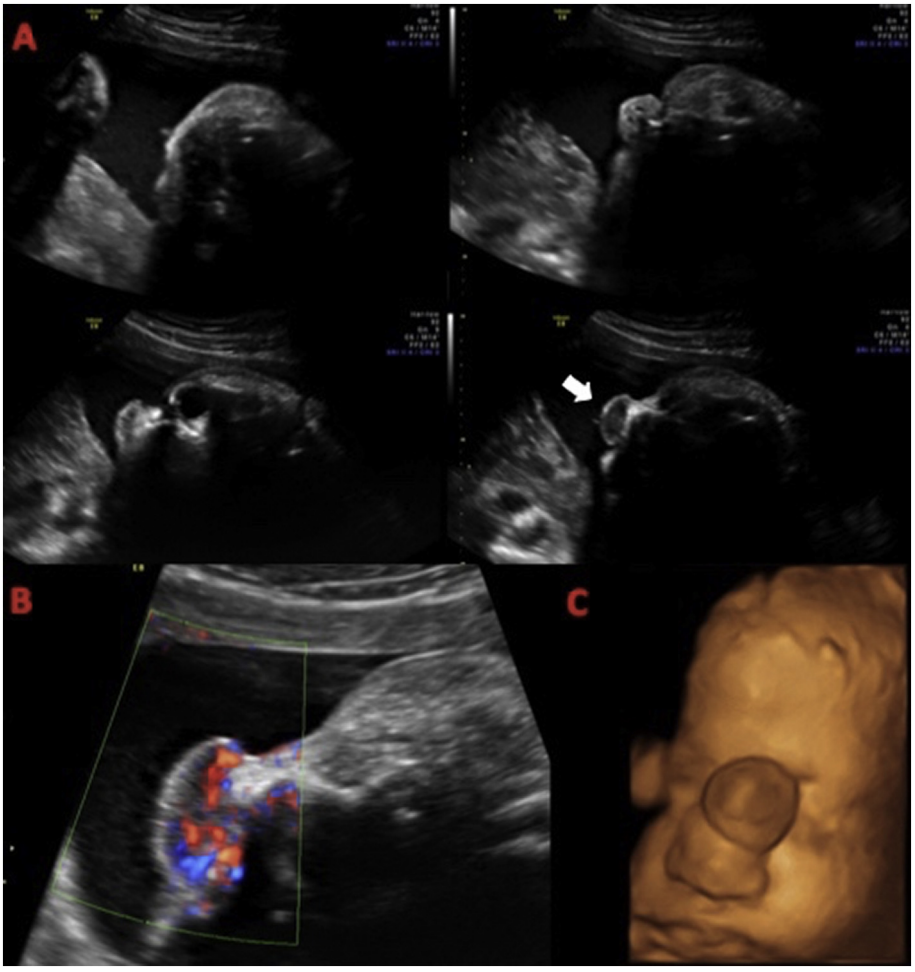

Fig. 1. The prenatal ultrasound findings, A) B-mode, arrow showing the tumor B) Doppler flow C) 3D ultrasound.

3. Discussion

This patient presented in the 34th gestational week, which is not usually ideal for detecting facial abnormalities. The posterior-wall placenta, an adequate amount of amniotic fluid, and the experience of the sonographer made it possible to visualize the tumor well and limit the differential diagnoses. Performing both 3D ultrasound and prenatal MRI is helpful in reaching a definitive diagnosis and has been recommended in several publications [2]. Both investigations were performed mainly to exclude the involvement of the neurocranium and thus meningoceles. The MRI report suggested the diagnosis of proboscis lateralis, which is a facial malformation with an incidence of 1:100,000. It presents as a rudimentary, nose-like, soft, tubular process medial to the orbit at the nasal root and can be isolated or associated with other

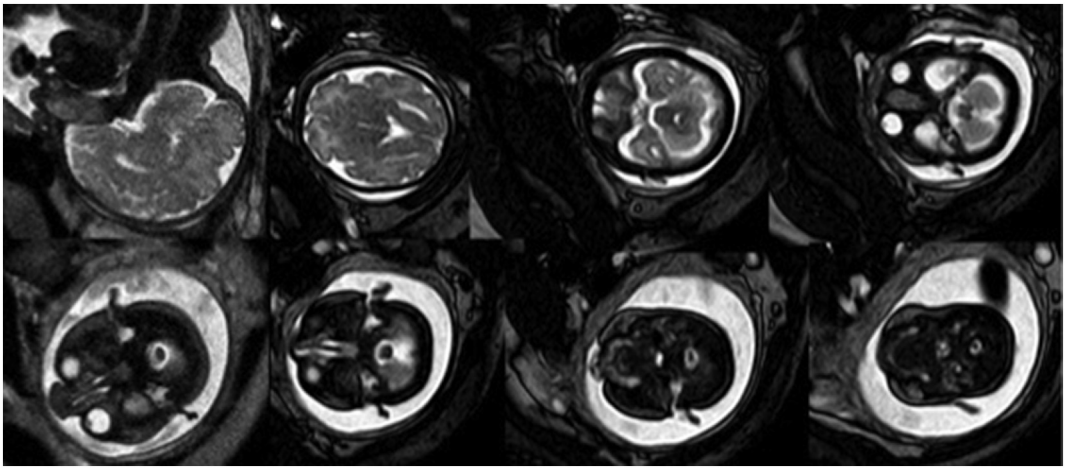

Fig. 2. The intrauterine MRI for assessing the tumor and the fetal cranium.

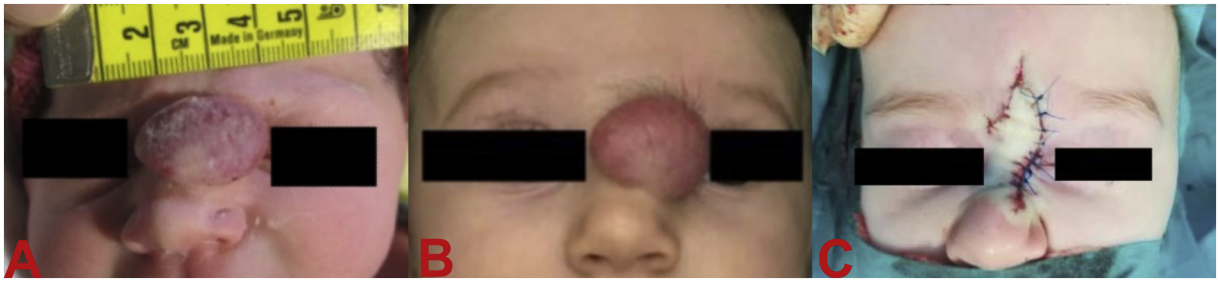

Fig. 3. The morphological appearance of the tumor, A) postnatally, B) after 5 months of β-blocker therapy, C) post-excision.

malformations, such as nasal hemiplasia/aplasia, atypical clefting, orbital malformations, brain malformations and mental retardation [3]. It has male predominance and is usually unilateral [4] – very few bilateral cases are described in the literature [5].

It has been classified into 6 groups depending on the associated abnormalities and the prognosis depends on this classification [6]. Even though the fetus in this case was female and proboscis lateralis has a male predominance of 3:1, it could still have been the correct diagnosis, as it does also affect females [4]. The fact that the left nasal canal was not visible on MRI suggested to the radiologist a diagnosis of proboscis group II, which is the most common form of proboscis lateralis and is associated with ipsilateral nasal deformity [6]. Retrospectively, it is known that the left nasal canal was normal but could not be visualized with prenatal MRI due to external obstruction of the tumor that prevented amniotic fluid entrance. The parents were counseled accordingly and the fact that the tumor showed no significant growth during pregnancy supported this differential diagnosis. Caesarean section was planned for several reasons, one of which was the wish of the mother-to-be not to deliver vaginally, but other medical reasons also supported this decision. Cranio-cervico-facial tumors can often block the airways and cause congenital high-airway obstruction syndrome (CHAOS). Optimizing the delivery environment with planned timing, availability of neonatologists and EXIT procedure as an option during the operation is recommended [7]. This case was unlikely to involve CHAOS, thus EXIT procedure was only discussed during counseling, and not planned. Facial hemangioma was also a differential diagnosis and it can tear and subsequently bleed profusely during vaginal delivery. This was another reason for elective caesarean section in this case.

The postnatal clinical characteristics of the tumor confirmed the differential diagnosis of a facial hemangioma rather than a proboscis lateralis. Hemangiomas are well-isolated benign tumors with a rich vascularization and represent the most common tumor of infancy. They can affect different parts of the body and can present either intra- or extracorporally. Facial hemangioma is one of the possible extra-corporal presentations [8]. Their typical ultrasound presentation is rich vascularization, occasionally with dense calcification. Their prognosis is dependent on the size and growth. Big hemangiomas could significantly impair the fetal circulation, causing cardiomegaly, secondary cardiopathy and ascites; thus, regular ultrasound follow-ups are important to study the growth of these tumors and detect early signs of circulatory impairment [9]. It is important to remember that the absence of a Doppler signal rules out larger vessels only, and a very vascular mass of capillaries and arterioles might lack a Doppler signal. The tumor in this case showed positive vascularization with a low PRF and did not grow significantly during pregnancy; the fetal circulation remained intact throughout the pregnancy. The postnatal clinical appearance of the tumor and the vascularization were the main indicators of a facial hemangioma. The postnatal management of hemangiomas has evolved immensely and moved away from immediate surgical intervention. The renin-angiotensin system plays a significant role in the development of hemangiomas and non-selective β-blockers such as propranolol have become the first line of therapy. This treatment usually lasts for about one year with such significant tumor involution that surgery is required in only 10% of cases [8]. The newborn was accordingly treated with propranolol and regular follow-ups were scheduled in order to detect possible cardiac impairment caused by the medication. Even though treatment continued for 5 months, the tumor showed no regression. This is atypical for hemangiomas and thus a biopsy is recommended in similar cases.

Surprisingly, the biopsy showed that the tumor was a GCT, an extremely rare tumor originating from the Schwann cells of the neural sheath. They can affect any submucosal or subcutaneous tissue throughout the body, but predominantly involve the neck, oropharynx, head, breast and vulva, with a female predominance of 4:1 [10]. The usual age for presentation of GCTs is during the fourth or fifth decade of life and the largest review of GCT cases reported only one case of neonatal GCT. This would make this case the second in the world literature, to our knowledge [11]. GCT at a younger age can be associated with genetic syndromes such as Noonan syndrome, but this case showed that this was an isolated tumor without further pathological associations [12]. GCTs are almost always benign tumors – only 1–3% have malignant potential. Wide excision with clear margins is the recommended therapy, and is achievable in about 30% of cases. Positive margins increase the risk of recurrence from 2% to around 20% [10]. This patient can be considered fortunate, in that excision with free margins was possible with a good cosmetic result, given the location of the tumor. Post-excision histology confirmed this rare diagnosis and annual follow-ups are planned, conforming to existing recommendations.

To conclude, there are several possible differential diagnoses for fetal facial tumors. Prenatal ultrasound with Doppler and 3D transducers in combination with MRI are essential to determine the exact diagnosis, which in turn will allow the patients to be counseled correctly and the perinatal management to be planned. The availability of expertise and instruments for prenatal diagnosis does not necessarily guarantee achievement of the correct diagnosis. Rare conditions such as the GCT described here can be diagnosed only postnatally and it is important to remember and include this challenge in counseling mothers whose fetus has a facial tumor.

Contributors

Ammar Al Naimi was responsible for the concept and design of the case report, and for drafting the manuscript.

Stephan Spahn was responsible for acquisition of data.

Franz Bahlmann was responsible for critical revision and supervision.

Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

Funding

No specific grant from funding agencies in the public, commercial, or not-for-profit sectors supported the publication of this case report.

Patient Consent

Informed consent was obtained from the parents of the patient for the publication of this case report.

Provenance and Peer Review

This case report was peer reviewed.

Acknowledgements

This work was supported by the Dr. Senkenbergische Stiftung, Frankfurt am Main, Germany.

References

[1] D. Rotten, J.M. Levaillant, Two- and three-dimensional sonographic assessment of the fetal face. 1. A systematic analysis of the normal face, Ultrasound Obstet. Gynecol. 23 (2004) 224–231.
[2] J.C. Shih, W.C. Hsu, H.C. Chou, S.S. Peng, L.K. Chen, Y.L. Chang, F.J. Hsieh, Prenatal three-dimensional ultrasound and magnetic resonance imaging evaluation of a fetal oral tumor in preparation for the ex-utero intrapartum treatment (EXIT) procedure, Ultrasound Obstet. Gynecol. 25 (2005) 76–79.
[3] S.B. Magadum, P. Khairnar, S. Hirugade, V. Kassa, Proboscis lateralis of nose - a case report, Indian J. Surg. 74 (2012) 181–183.
[4] J.M. Guerrero, M.S. Cogen, D.R. Kelly, B.J. Wiatrak, Proboscis lateralis, Arch. Ophthalmol. 119 (2001) 1071–1074.
[5] V. Kolluru, S. Coumary, Proboscis lateralis: a rare bilateral case in association with holoprosencephaly, J. Clin. Diagn. Res. 9 (2015).
[6] Y. Sakamoto, J. Miyamoto, H. Nakajima, K. Kishi, New classification scheme of proboscis lateralis based on a review of 50 cases, Cleft Palate Craniofac. J. 49 (2012) 201–207.
[7] R. Zieliński, M. Respondek-Liberska, The role of prenatal ultrasound assessment in management of fetal cervicofacial tumors, Arch. Med. Sci. 12 (2016) 850–855.
[8] T. Itinteang, A. Withers, P. Leadbitter, D.J. Day, S.T. Tan, Pharmacologic therapies for infantile hemangioma: is there a rational basis? Plast. Reconstr. Surg. 128 (2011) 499–507.
[9] M. Respondek-Liberska, K. Janiak, A. Jakubek, I. Marosyñka, B. Lipka, B. Dembowska, B. Milewska-Bobula, D. Perek, J. Wilcyñski, Prenatal diagnosis of fetal face hemangioma in a case of Kasabach-Merritt syndrome, Ultrasound Obstet. Gynecol. 19 (2002) 627–629.
[10] A. Al Naimi, F. Schulze, M. Schmidt-Fittschen, F. Bahlmann, Granular cell tumors are very rare but important vulvar masses that should not be overlooked, J. Genit. Syst. Disord. 5 (2016) 4.
[11] C. Dupuis, K.C. Coard, A review of granular cell tumours at the University Hospital of the West Indies: 1965-2006, West Indian Med. J. 58 (2009) 138–141.
[12] B. Vera-Sirera, P. Zabala, C. Aviño-Mira, F.J. Vera-Sempere, Multiple granular cell tumors with metachronous occurrence in tongue and vulva. Clinicopathological and immunohistochemical study, J. Oral Maxillofac. Pathol. 18 (2014) 437–441.