

Case Report

Fetal mosaic trisomy 2q associated with polydactyly

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Received February 22, 2018; Accepted October 25, 2018; Epub November 15, 2018; Published November 30, 2018

Abstract: Trisomy 2q is a rare cytogenetic anomaly, which shares some characteristic features. Here we report the first case of a fetus with preaxial polydactyly in both hands that was found to be associated with trisomy 2q mosaicism. SNP array can reveal the partial trisomy mosaicism in uncultured material in contrast to traditional chromosome analysis.

Keywords: Trisomy 2q, mosaicism, SNP array, FISH, polydactyly

Trisomy 2q is a rare cytogenetic anomaly mostly resulted from a balanced parental translocation and therefore associated with deletion of part of another chromosome. Trisomy 2q shares some common characteristic features, including failure to thrive, microcephaly, craniofacial anomalies, developmental delay, severe to profound mental retardation, and limb malformations [1]. Polydactyly is a common congenital limb malformations, It tends to be associated with *GLI3* (165240) on chr7p13 and *SHH* (600725) on chr7q36 [2]. Here we report the first case of a fetus with preaxial polydactyly in both hands that was found to be associated with trisomy 2q mosaicism.

A 32-year-old nulliparous woman at 26 weeks' gestation was referred to our reproductive genetics because of two soft markers on her antenatal fetal anomaly ultrasound scan, bilateral choroid plexus cysts and preaxial polydactyly in both hands (**Figure 1**). Cordocentesis chromosome analysis showed normal female chromosomes, 46,XX in 50 cells examined (**Figure 2A**). SNP array showed a 131.38 Mb copy number mosaic gain of the long arm of chromosome 2, region q13 to q37.3, with molecular karyotype arr [hg19] 2q13q37.3 (111,400,648-242,783,384)x2-3 (**Figure 2C**). In order to con-

firm the result of SNP array, fluorescence in situ hybridization (FISH) analysis was performed by using two telomere probes with TelVysion 2p green probe (VIJ2yRM2052, Vysis) and TelVysion 2q orange probe (VIJ2yRM2112, Vysis), the results showed that 25 out of 100 unstimulated interphase cells (25%) had trisomy 2q (**Figure 2B**). The SNP array of the parents were normal, trio analysis showed that the duplicated chromosomal material was maternal in origin. The pregnancy was terminated because of the ultrasound abnormalities and the abnormal SNP array results. A female fetal autopsy was not performed, but trisomy 2q features of the fetus have been observed, including a prominent forehead and glabella, hypertelorism, a broad and flat nose, a long flat philtrum, a short neck, limb malformation.

The fetus shares common craniofacial anomalies with previous reports of trisomy 2q [1]. As concerns the limb malformation, it is noteworthy that the HOXD clusters, a family of genes supposed to play a role in the control of limb morphogenesis [3]. HOXD was the gene most likely to be involved in polydactyly [4]. In the present case, a genotype phenotype correlation is quite easy to establish because of the common characteristic features associ-



Figure 1. Antenatal fetal anomaly ultrasound scan at 26 weeks of gestation showed preaxial polydactyly.

ated with the chromosomal regions involved. Even though the percentage of mosaic cells was low (25%) for lymphocytes, the mosaic 2q duplication contributes to major aspects of our patient's phenotype.

Prenatal diagnosis of mosaic partial trisomy is difficult and challenged due to the lack of cases [5], however an important finding can help explain ultrasound anomalies. The mosaic trisomy 2q was likely to be contributing to preaxial polydactyly in both hands. The phenotype of the fetus correlates well with her trisomy 2q mosaicism. SNP array on uncultured DNA may avoid the detection of cultural artefacts and accurately identify the true level of mosaicism, which may be missed by G-banded chromosome analysis.

In conclusion, this report demonstrates that trisomy 2q could be associated with facial defects and this is believed to be the first case of pre-

axial polydactyly associated with trisomy 2q mosaicism.

Acknowledgements

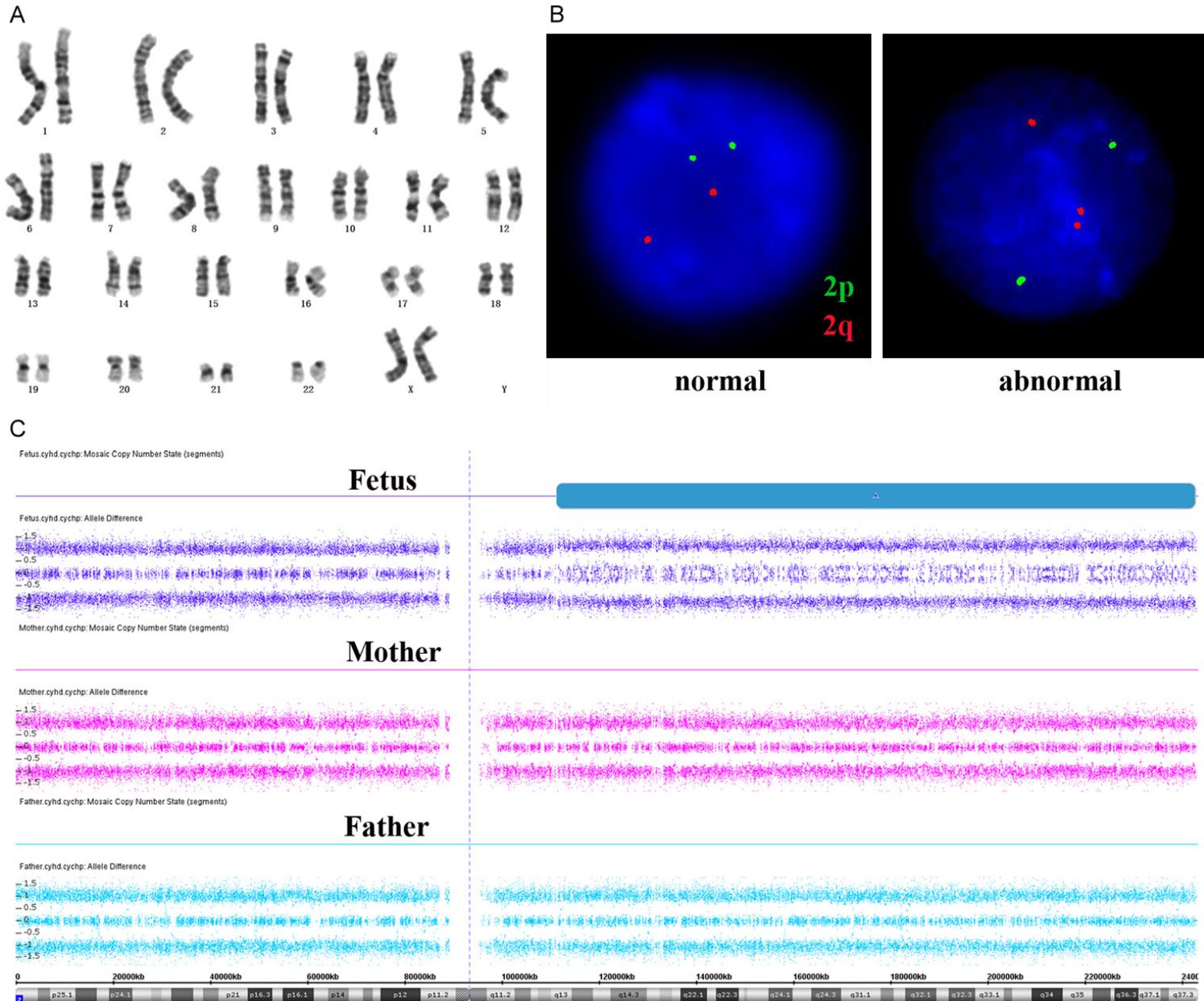
The work was supported by the Medical Scientific Research Foundation of Zhejiang Province (2017KY427), the Education Commission of Zhejiang Province (Y201737590), National Key Research and Development Plan (2018YFC1002702).

Disclosure of conflict of interest

None.

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Figure 2. Genetic analysis on the fetus with mosaic trisomy 2q. A. Karyotype analysis of cordocentesis showed normal karyotypes. B. FISH results with chromosome 2p subtelomeric probe (green) and chromosome 2q subtelomeric probe (red), Interphase FISH analysis on lymphocytes revealed low-level mosaicism showing 25 out of 100 cells (25%) with trisomy 2q. C. SNP-array analysis on uncultured cordocentesis sample showing 131.38 Mb mosaic gain from chromosome region 2q13 to 2q37.3 (111,400,648-242,783,384) and normal parental sample.

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