Growth hormone deficiency and pituitary dysgenesis in a girl with microdeletion 2q31.1

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INTRODUCTION

Microdeletions of the chromosomal region 2q31.1 are rare. Growth retardation, developmental delay, limb abnormalities, short palpebral fissures and heart defects are phenotypic abnormalities, described in these patients (1,2). So far, growth hormone deficiency was not reported in a patient with 2q31.1 microdeletion. Cerebral malformations are facultative clinical features and there is one report of a midline defect (3). We present a clinical description and the molecular data of a new patient with microdeletion 2q31.1.

CASE REPORT

History

- normal pregnancy
- normal birth after 38+2 weeks of gestation (weight 2730g [-1.2SDS], length 48cm [-1.2SDS], head circumference 33cm [-1.1 SDS])
- Karyotyping was performed in the neonatal period because of single transverse palmar crease and was normal (46,XX)

Family History

- non consangineous parents (height: mother 174cm, father 182cm), one healthy sister
- malignant melanoma in the grandmother and the mother
- no developmental delay, no syndromic features in any of the family members

Clinical Course

- feeding problems in the first year of life
- delayed motor development (crawling with 20 months, walking with 2 years)
- moderately reduced mental performance (first words with 5 years)
- vision normal, no hearing problems
- severe growth failure

Clinical Features

- short palpebral fissures, ptosis, strabismus, high arched palate
- single transverse palmar crease on one hand
- no skeletal abnormalities
- age 7 years: height 104.2 cm (-4.4 SDS), weight 16.0 kg (-3.4 SDS), height velocity 1.3 cm/year (-7 SDS), head circumference (11,1 years) 50.2cm (-2.5SDS)

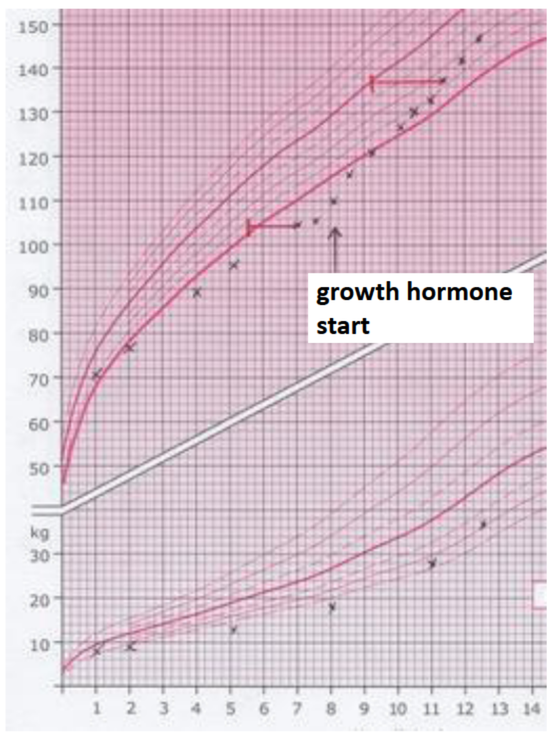

Fig. 1: linear growth of our patient

Longitudinal linear growth data for German Girls are graphed, with percentiles indicated (Kromeyer-Hauschild et al., 2001)

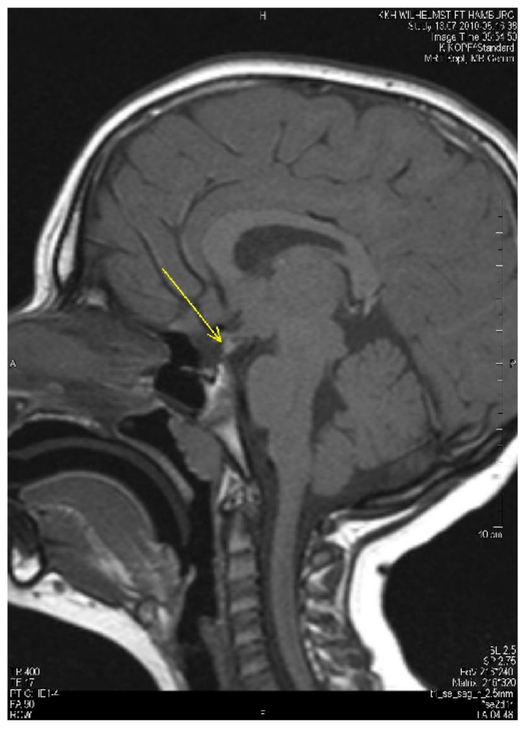

Fig. 2 MRI scan of our patient at the age of 7 years: Midsagittal T1-weighted image showing missing continuum of the infundibulum and slightly hyperintense thickening proximal (yellow arrow).

CONCLUSION

This is the first report of growth hormone deficiency in a patient with microdeletion 2q31.1. Cerebral MRI scan demonstrated dissociation of adeno- and neuropituitary in our patient. Other hormone deficiencies were not detected. Because patients with microdeletions of the area 2q31.1 frequently have limb abnormalities and also because syndromic short stature can be assumed, growth hormone deficiency may be missed. MRI scan is frequently performed in these patients because of developmental delay and should also focus on the pituitary region.

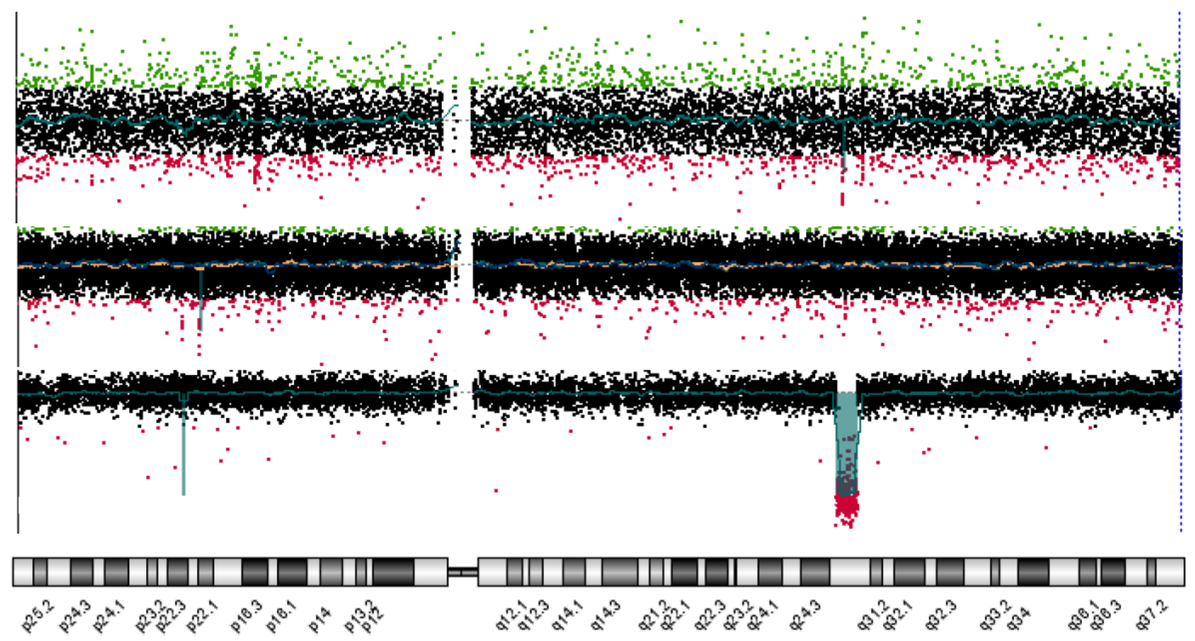

Fig. 3: Array-CGH (180K-chip , average resolution 0.15Mb) of the patient (bottom) shows a 4.3 Mb deletion in 2q31.1 Analysis of the mother (top) and the father (middle) revealed normal results.

Endocrinological Examination (age 7 years)

- IGF1 <25ng/ml, IGFBP3 1.24mg/l (3rd percentile 1.6mg/l)
- Arginin stimulation test: growth hormone (GH) peak 1.2ng/ml
- Glucagon stimulation test: GH peak 1.2ng/ml, hypoglycemia (31mg/dl)
- Cortisol 15.3µg/dl (while hypoglycemic), basal morning cortisol 5.2µg/dl (normal)

Cerebral MRI scan

Dissociation of anterior and posterior pituitary

➢ **treatment with growth hormone (0.025mg/kg/d) sc.**

Follow up (age 12 years)

- height 142.4cm (-1.6SDS), weight 33.9kg (BMI 16.7kg/m^2, 44th percentile), height verlocity 9.5cm/ year (+1.9SDS)
- Tanner stage B2

LITERATURE

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