GHD associated with arteriovenous complex malformation – case report

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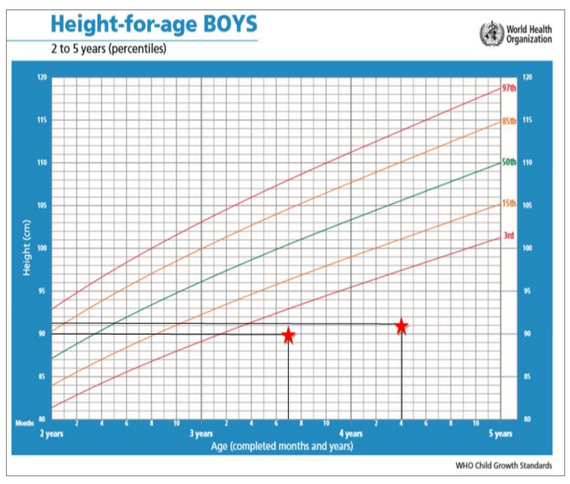
Background: Arteriovenous malformations (AVMs) are rare in kids, estimated to represent 3% of all AVMs. They tend to rupture more frequently than in adults, that is why, usually, AVMs are brought to attention after rupture, as the most common cause of non-traumatic intracerebral hemorrhage. AVMs could also present as recurrent seizures or headaches. Their optimal management remains controversial.

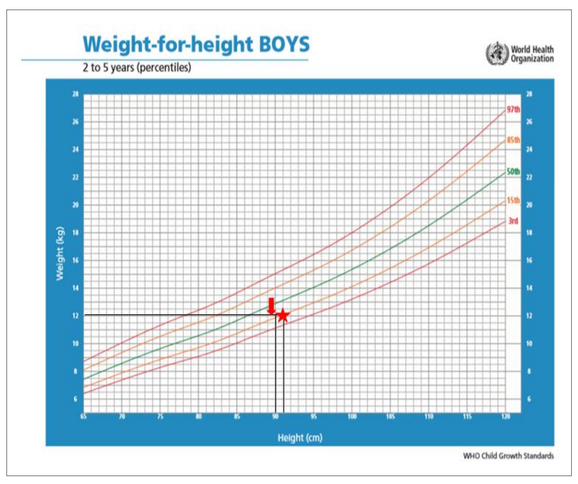
Case presentation:

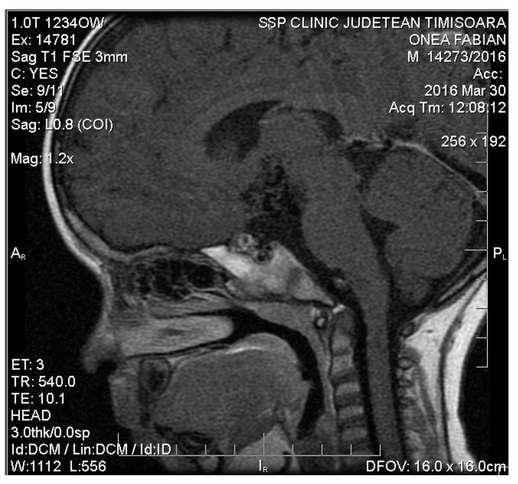
- 4.5 years old boy, referred to our department because of growth deficit - slow growth and poor weight gain,
- Personal history:
  * he was a healthy newborn, with normal parameters at birth who has grown up normal until the age of 18 months when he has experienced an episode of ***seizure***.
  * then he was hospitalized in a pediatric department and the complete evaluation revealed ***hypoglycemia***.
  * the evaluation also included: IGF1, basal GH, cortisol, serum insulin level and oral glucose tolerance test (OGTT) : all were in normal range.
- ***Hypoglycemia*** was thought to have occurred in the absence of a proper meal schedule, so an appropriate for age meal plan was recommended and he was followed–up for the next 6 months. Unfortunately the parents did not show up for the scheduled check-ups.
- 3 years later, the parents addressed the child to our department.

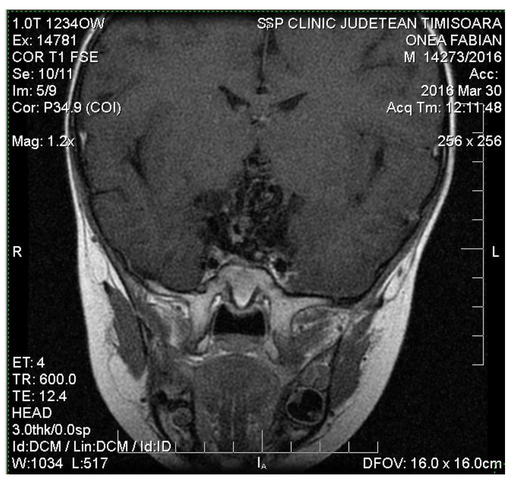
Clinical Examination:

- height deficit: SDS_{height} = -3, weight deficit: W/H = 15th percentile (Figure 1), no particular clinical features.
- *Investigations revealed*: delayed bone age ***(BA –CA = -3.5***), growth hormone deficit (IGF1 < 25 ng/ml ↓, low stimulated GH) confirming GHD.
- ***MRI*** exam of the head revealed complex arteriovenous malformation involving the left carotid artery and the Willis polygon. The optic chiasm was dislocated anterior and the pituitary gland and stalk difficult to identify, possibly also dislocated by the arterio-venous malformation located in and above the sella turcica.
- The child was scheduled for surgical intervention, results are to be communicated subsequently.









Discussions:

✓ GHD is frequently encountered in any process that compresses the sella and pituitary gland (tumors, cysts, vascular malformations).

✓ The particular evolution of this case lies in the lack of clinical signs suggestive either for compression of the sella/pituitary by the AVM (headache, vomiting) or for GHD/other pituitary deficits, except for the isolated, episodic hypoglycemia associated with seizures, which was attributed to an inadequate for age meal plan.

Conclusion:

- ***Hypoglycemia*** requires a complete evaluation of GHD/MPHD, including GH stimulation tests and imaging of the pituitary and sella in order to exclude hypopituitarism caused by a process exerting compression in this area.

Disclosure statement: I declare that I have no potential conflict of interest

References:

1. Niazi, Toba N. et al. *Diagnosis and Management of Arteriovenous Malformations in Children*. Neurosurgery Clinics July 2010 , Volume 21 , Issue 3 , 443 – 456.
2. Bradley A. Gross, Rose Du, *Natural history of cerebral arteriovenous malformations: a meta-analysis.* Journal of Neurosurgery, *Feb 2013* / Vol. 118 / No. 2 : Pages 437-443.
3. Wuyang Yang, Heather Anderson-Keightly, Erick M. Westbroek, Justin M. Caplan, Xiaoming Rong, Alice L. Hung, BA, Geoffrey P. Colby, Alexander L. Coon, Rafael J. Tamargo, Judy Huang and Edward S. Ahn. *Long-term hemorrhagic risk in pediatric patients with arteriovenous malformations.* Journal of Neurosurgery, 2016: Pediatrics 18:3, 329-338.
4. Bristol RE, Albuquerque FC, Spetzler RF, Rekate HL, Mc-Dougall CG, Zambramski JM. *Surgical management of arteriovenous malformations in children.* J Neurosurg , 2006.(2 Suppl) 105:88–93.
5.Shields, R., Mangla, R., Almast, J. et al. *Magnetic resonance imaging of sellar and juxtasellar abnormalities in the paediatric population: an imaging review*. Insights Imaging (2015) 6: 241.