Hypothalamic Hamartoma Revealed by Precocious Puberty in Girls: About A New Case

S. Aminou, A. Gaouzi, and Z. Imane

ABSTRACT

Precocious puberty is a multifactorial process whose diagnosis is based, first of all, on the clinic but also on the realization of the bone age, the pelvic ultrasound and the cerebral IRM. Moreover, the GnRH test constitutes the cornerstone to highlight a premature activation of the Hypothalamo-hypophyseal axis. We report the case of a 3-year-old girl admitted for exploration of precocious puberty. The central origin was confirmed by a GnRH test with a peak reaching 45 mIU/L. A hypothalamohypophyseal MRI was performed, showing a mass consistent with a hypothalamic hamartoma. Treatment with GnRH analogues is the treatment of choice for central precocious puberty.

Keywords: Hypothalamic hamartoma, LHRH agonist, precocious puberty.

Submitted: July 2, 2021

Published.: August 20, 2021

ISSN: 2593-8339

DOI: 10.24018/ejmed.20213.4.965

S. Aminou*

Pediatric Endocrinology-Diabetology Unit, Pediatrics Department 2 Children's Hospital, IBN-SINA University Hospital Centre, Rabat, Morocco.

(e-mail: aminousarah40@gmail.com)

A. Gaouzi

Pediatric Endocrinology-Diabetology Unit, Pediatrics Department 2 Children's Hospital, IBN-SINA University Hospital Centre, Rabat, Morocco.

Z. Imane

Pediatric Endocrinology-Diabetology Unit, Pediatrics Department 2 Children's Hospital, IBN-SINA University Hospital Centre, Rabat, Morocco.

**Corresponding Author*

I. INTRODUCTION

Precocious puberty is defined as the early development of sexual characteristics before the age of 8 years in girls and before the age of 9 years in boys [1]. The use of neuroimaging is essential in central precocious puberty in girls in order to detect an organic cause, as exceptional as it may be, namely hypothalamic hamartoma. We report the case of a 3-year-old girl admitted for exploration of precocious puberty which revealed the presence of a hypothalamic hamartoma which remains a rare etiology.

II. CASE REPORT

Child aged 3 years (Date of Birth =16/04/2018), female, last of a sibling of three, birth weight = 3500 g, good psychomotor development, with no particular pathological history, who consults for an increase in the volume of the mammary gland noted since 4months. The clinical examination revealed a development of pubertal characteristics at S3P2 according to Tanner, without signs of oestrogenic impregnation, Weight = 17 kg (+2DS), Height = 100 cm (+2DS). Bone age at 4 years for a chronological age of 2.5 years (Fig. 1). Breast ultrasound = bilateral homogeneous hypertrophy of glandular tissue measuring

35×40×14 mm. Pelvic ultrasound=absence of utero-ovarian anomaly. Hypothalamic-pituitary MRI was performed showing an oval mass, measuring 9x8 mm, with regular borders, isointense T1, hyperintense T2, located below the floor of the 3rd ventricle, consistent with a hypothalamic hamartoma (Fig. 2 and 3). Biology: TSH = 1.543 uIU/mL, T4=0.94 ng/dL Beta HCG=5 mIU/mL, FSH=9.2 mIU/mL, LH=4.2 mIU/mL, Estradiol=41 pg/mL. The central origin was confirmed by a GnRH test with a peak reaching 45 mIU/L, LH/FSH ratio=2.3. Child put on GnRH analogue treatment.

Fig. 1. Bone age at 4 years for a chronological age of 2.5 years.

Fig. 2. Magnetic resonance imaging in T2 (A) and T1 (B): the lesion process, with a signal identical to the gray matter develops from the floor of the third ventricle.

Fig. 3. Coronal T2 magnetic resonance imaging: the lesion process develops from the floor of the third ventricle.

III. DISCUSSION

Central precocious puberty is due to premature activation of the hypothalamic-pituitary-gonadal axis. The hypothalamic hamartoma represents its most frequent cause. It is a congenital, non-neoplastic, malformative lesion of the hypothalamic tuber cinereum, consisting of hypothalamic ectopic tissue, related to a rare migration disorder of the central nervous system [2]. The hypothalamic hamartoma was first described by Marquant and Russell [3]. Precocious puberty is its most frequent clinical manifestation, sometimes it is responsible for gelastic epilepsy or delayed psychomotor development [4]. The LHRH test studies the response of the gonadotropic axis to confirm or deny its activation. It is accepted that an LH peak greater than 5 mU/L and an LH/FSH ratio greater than 1 at the time of the peak is

consistent with activation of the axis, and thus with puberty of central origin [1]. The diagnosis is not very problematic compared to other masses in the region: it relies on brain MRI. The appearance is characteristic; the topography is constant, appended to the mammary tubercles, behind the pituitary stem. The mass is in T1 iso-signal and often in discrete hyper signal on long T2 and FLAIR sequences [5]. The size of the tuber hematoma is variable. There is never any contrast. The treatment, because of the difficulty of access and the benignity of the lesion, is essentially medical by the administration of LH-RH agonists associated with antiepileptic drugs [3]. The restraining treatment takes the form of monthly or quarterly injections (LP retardant), given subcutaneously or intramuscularly, and is usually continued until an average age of 11 years in girls [6]. It is administered at a dose of one ampoule per month for children weighing more than 20 kg and half an ampoule for those weighing less than 20 kg. Surgical resection is indicated only in cases of progressive neurological deficit, hydrocephalus, or frequent seizures that are resistant to medical treatment [7]. However, careful monitoring of the clinical course, growth and bone age at a minimum, is usually done every 6 months at the time of diagnosis, and then more frequently. It should be noted that in 10-15% of cases, episodes of uterine withdrawal hemorrhage may occur during the first months of treatment [2], and patients and their parents should be warned of the risk of transient vaginal bleeding, which may require the addition of progestin therapy.

IV. CONCLUSION

Hypothalamic hamartoma is similar to a congenital neuronal malformation with an incidence ranging from 1/100,000 to 1/1,000,000. The long-term prognosis is preserved, and the therapeutic challenge is major.

COMPETING INTERESTS

The authors declare no competing interests.

AUTHORS' CONTRIBUTIONS

All the authors have read and agreed to the final manuscript.

REFERENCES

- [1] S. Benyakhlef, N. Messaoudi, S. Rouf, H. Latrech, "Hypothalamic hamartoma revealed by precocious puberty: about a case." *SFE Marseille* 2020; *Annales d'Endocrinologie* ; 81 : 282-314.
- [2] J. Mounacha, R. Abilkassem, A. Zerhouni, A. Satté, A. Bourazza, H. Baizri, H. Ouhabi, A. Agadr, "Precocious puberty due to hypothalamic hamartoma." *Archives of Pediatrics*; 2010; 17:1095-1097.
- [3] A. S. Harvey, J. L. Freeman, "Epilepsy in hypothalamic hamartoma: Clinical and EEG features." *Semin Pediatr Neurol*; 2007; 14: 60-4.
- [4] N. Ech-Cherif El Kettani, O. Mouti, H. Benchaaboun, M. Fikri, M-R El Hassani, M. Jiddane, "Hypothalamic hamartoma revealing gelastic seizures." *Archives of Pediatrics* 2014; 21:529-531.
- [5] Dorfmueller G, Fohlen M, Bulteau C, O. Delalande, "Surgical disconnection of hypothalamic hamartomas." *Neurosurgery* 2008; 54:315-9.
- [6] P. Pallavee, R. Samal, "Precocious puberty: a clinical review." *Int J Reprod Contracept Obstet Gynecol.* 2018 Mar;7(3):771-777.

- [7] I. R. Rousso, M. Kourti, D. Papandreou, A. Tragiannidis, F. Athanasiadou, "Central precocious puberty due to hypothalamic hamartoma in a 7-month-old infant girl." *Eur J Pediatr* 2008; 167:583–585.