Neuroendocrine consequences of Hypothalamic Hamartoma and their Imaging (MRI) and Surgery Correlate

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INTRODUCTION:

Hypothalamic hamartomas (HH) are rare heterotopic congenital malformations causing central precocious puberty (CPP) and/or resistant epilepsy whose natural history is unknown.

AIM:

To describe clinical and imaging features, and the risk of developing endocrine deficits, especially after surgery

METHODS:

Retrospective case note and imaging review of all HH (n=59) diagnosed by MRI between 30.08.1991 and 24.11.17, analyzed by initial presentation, imaging (Delalande grading), and surgery.

RESULTS:

CLINICAL FEATURES BY DIAGNOSTIC PRESENTATION

	CPP	Epilepsy*	Incidental	TOTAL
Number (n)	17	32	10	59
Sex (F)/(M) (n)	11/6	7/25	5/5	23 (F) **36(M)**
Age diagnosis HH (years)	1.35 y. (0.64-8.49)	5.62 y. (0.16-15.59)	0.9 y. (antenatal-9.78)	2.72 y. (antenatal-15.59)

Table 1: Clinical manifestation throught the follow-up

**Gelastic/dacrystic seizures*

OUTCOME

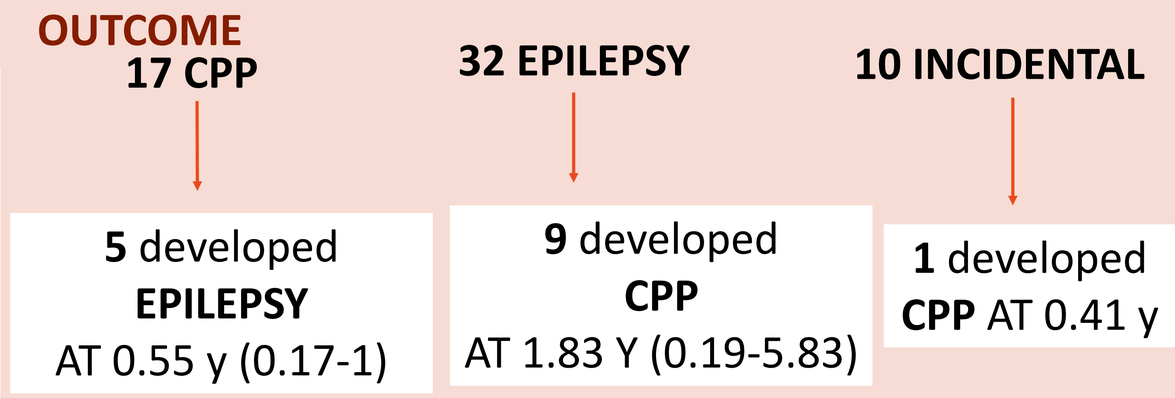


Diagram 1: Clinical manifestation throught the follow-up

Despite 60% experiencing seizures* in their first year of life, patients with epilepsy (total number=37) had a 2.96 year delay in HH diagnosis compared with CPP (total number= 27) (Mann-Whitney $p<0.05$)

RADIOLOGICAL FEATURES ACCORDING TO DELALANDE GRADING

DELANLANDE	CPP	P value	Epilepsy	P value
Type 1	14	<0.05	4	>0.05
Type 2	1	>0.05	10	<0.05
Type 3	6	>0.05	13	<0.05
Type 4	4	>0.05	6	>0.05

Table 2: Classification of HH according to Delanlande grading
*Missing data: 4

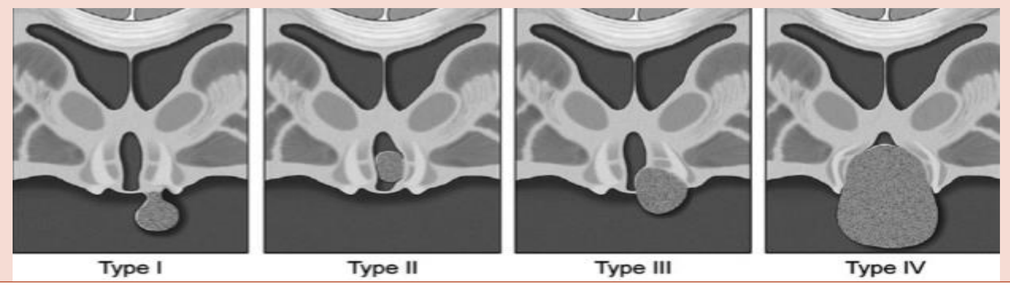
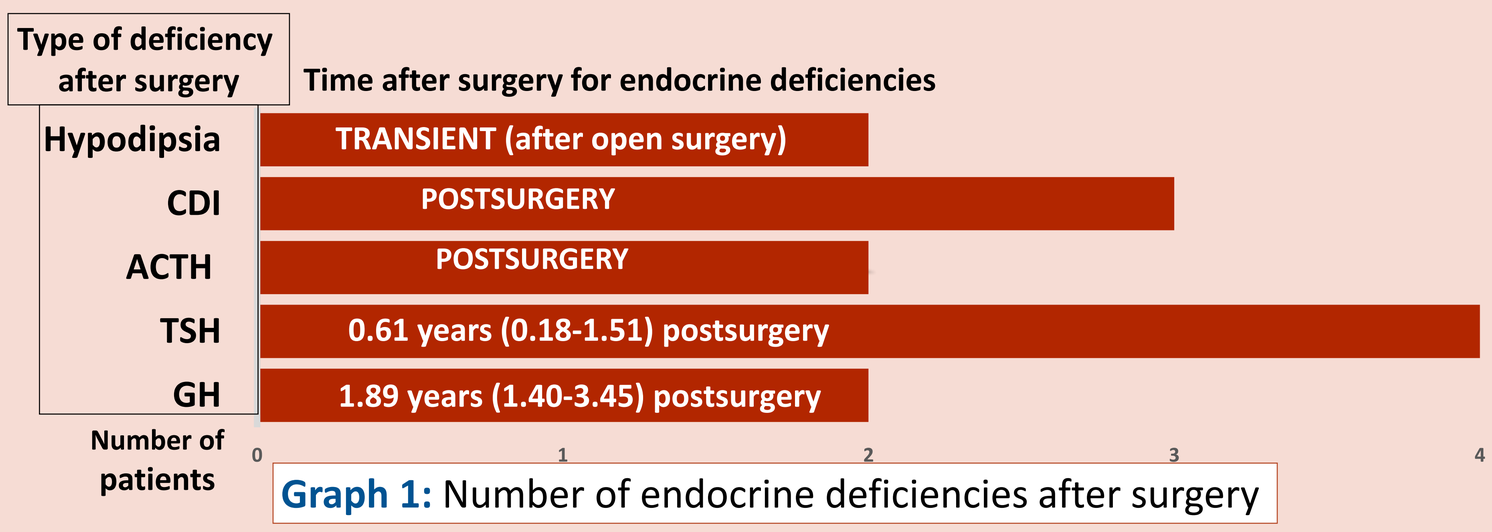


Image 1. Classification system for HH, proposed by Delalande[1].

Type 1: bellow of the third ventricule´s floor
Type 2: attachment to the wall of the third ventricle´s floor, **above** of it
Type 3: above and below of the third ventricle´s floor
Type 4: "giant" a lesión volume of 8 cm^3

ENDOCRINOLOGY COMORBIDITIES

- ✓ **66%** (n=39/59) were followed endocrinologically for 5.32 years (0.29-14.34): **BMI increased by 1.05** SDS (0.1-4.18)
- ✓ **GH deficiency** (GHD) occurred in 4 patients, **of whom 2 had never had surgery**
- ✓ 20 underwent surgery (4=endoscopic, 10=open, 4=radiosurgery, 2=laser) for intractable epilepsy at 8.10 years (0.17-16.88), 3 of whom required multiple attempts [(endoscopic+laser),(4endoscopic+open+radiosurgery), (open+radiosurgery+open)].
- ✓ Only 14 of 20 were followed after surgery: **GHD and ACTH deficiency (ACTHD) were associated with endoscopic surgery**($p<0.05$).



Graph 1: Number of endocrine deficiencies after surgery

N=1: **Isolated CDI** after open surgery
N=1: **CDI[1]+ GH[1] +ACTH[2]+TSH[2]**
[1]after endoscopic surgery & [2]after laser surgery
N=1: **ACTH[1]+GH[1]+CDI[2]**
[1]after first endoscopic & [2]after third endoscopic
N=3: **Isolated TSH deficiency**:
after open surgery (n=2) / after endoscopic (n=1)

CONCLUSION:

- ✓ Grade 1 HH more often cause CPP, and grade 2/3 cause epilepsy, but the features overlap
- ✓ **All should be endocrinologically screened for CPP, GHD and obesity over time**.
- ✓ Surgery causes additional deficits in 43 % of those operated on, with lifethreatening CDI and ACTHD in 15%, including one patient who received modern laser surgery.
- ✓ **This data helps inform therapeutic choices and hypothalamic morbidity in this disease and require close monitoring**.

REFERENCES:[1] [1]DELALANDE O, FOHLEN M. Disconnecting Surgical Treatment of Hypothalamic Hamartoma in Children and Adults with Refractory Epilepsy and Proposal of a New Classification. Neurologia medico-chirurgica 2003;43(2):61-68.