

# Rathke's cleft cysts and endocrine dysfunction in children

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disclosure statements : nothing to disclose

## Introduction

Rathke's cleft cysts (RCC) are benign sellar and/or suprasellar lesions of the pituitary gland. RCC are the result of an inappropriate persistence of a Rathke pouch, a normal component of pituitary development, which should normally close early in fetal development. RCC are used to arise between the fourth and sixth decades of life and predominantly in women. RCC have rarely been reported in children and adolescents. They are usually known as asymptomatic but some cases may be associated with hormonal disturbances. The frequency of RCC in children is not known.

## Objective

The aim of the study was to describe the endocrine manifestations of RCC in children.

## Methods

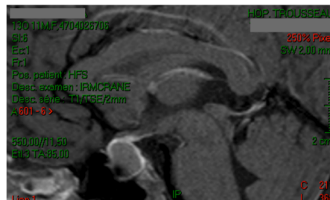
The study took place in the department of Endocrine Laboratory of Functional Explorations, Armand Trousseau hospital, Paris France. We retrospectively reviewed the clinical, biological, and magnetic resonance imaging findings in all RCC cases seen in our institution from 2004 to 2014.

## Results

We found 9 children with RCC. Their age ranged from 14 months to 16,5 years old at diagnosis (median age at 13,1 years). They were five males and four females. Common features at presentation were headaches (44%), growth retardation (33%) polyuria-polydipsia (11%), and one patient (11%) was asymptomatic. Six children had endocrine dysfunctions and four of them multiple deficiencies. There were 5 GH deficiencies (3 complete GH deficiencies and 2 partial GH deficiencies), 2 TSH deficiencies, 3 ACTH deficiencies, 1 hypogonadotropic hypogonadism and 2 diabetes insipidus. All cysts were in intrasellar position and 2 of them had a suprasellar portion. Five patients had a cerebral tomography to look for calcifications for craniopharyngioma. Two cases underwent surgical procedure because of diagnostic doubt; endocrine deficiencies remained after surgery.

Patient	Sex	Age	Headache	Visual loss	Endocrinologic dysfunction
1	M	16,5	-	-	+
2	F	13,2	-	-	+
3	F	15,8	+	-	-
4	F	9,3	+	-	-
5	M	7,1	+	+	+
6	M	12,4	+	-	+
7	M	1,2	-	-	-
8	F	13,5	+	-	+
9	M	13,1	-	-	+

Patient's characteristics and symptoms at diagnostic



MRI of patient n°8 was done because of headache : a 15 mm pituitary heterogenous mass, in isosignal in T1 and in hypersignal in T2. Surgery allowed the final diagnosis of Rathke's cleft cyst.

## Discussion

Although RCC are described as usually asymptomatic in children, we present 9 cases of children with RCC included 6 with endocrine deficiencies. The frequency of endocrine dysfunction in children with RCC is not calculable because the number of asymptomatic cases is not easily evaluable. Tanakashi and coll found 1,4% of RCC after analysing MRI of 341 children under the age of 15 years (1). The median age at diagnosis was 13 years old, which is consistent with the other pediatric studies. RCC seems to appear mostly during puberty (2). Symptoms usually described in RCC are headache, visual disturbances and endocrine dysfunctions. Among the five patients having headache, two had inconstant symptoms and RCC seemed not to be the cause of these symptoms. One child had visual disturbances (amputation of visual field). Some authors report central precocious puberty (CPP) associated with RCC (3). None of the children with RCC had CPP and none of those followed for CPP had RCC in our unit. The frequency of diabetes insipidus was higher than in the other studies (33% versus 0-28%). The frequency of deficiencies of the anterior pituitary gland was similar to those described in the literature (2).

Concerning the MRI features, intensity of T1 and T2 signals were variable. The common features of RCC seem to be the location (central in the sellar region between the ante- and post- pituitary gland), the well-defined contour, the lack of destruction or enlargement of sella turcica, and the homogeneity of the content. The difference with a craniopharyngioma or a dysgerminoma may be difficult. Other exams as cerebral tomography (to look for calcifications) or study of tumoral factors in the cerebro spinal fluid may be useful. Inflammation is likely to play an important role to explain endocrine dysfunctions in RCC, sometimes associated with compression of the anterior pituitary lobe. The molecular mechanisms of RCC are unknown. Two studies suggest the role of the Leukemia Inhibiting Factor (LIF), a pleiotropic cytokine involved in the early development of the pituitary gland, in the etiopathology of RCC (4).

## Conclusion

RCC are rare and association with hypopituitarism or diabetes insipidus is higher than expected. This association is not fortuitous since we did not find any RCC in all MRI done for central precocious puberty during the last ten years. Careful follow up is recommended; surgical procedures are required in case of visual disturbances, persistent headaches or diagnostic doubt.

## Endocrine dysfunctions

Patient	GH-D	TSH-D	ACTH-D	HPL	Gon-D	CPP	DI
1	+	-	-	na	-	-	-
2	+	+	+	na	+	-	+
3	-	-	-	-	-	-	-
4	-	na	na	na	na	-	na
5	-	-	+	-	na	-	+
6	+	-	-	-	-	-	-
7	-	-	-	na	na	-	-
8	+	+	+	na	-	-	-
9	+	-	-	-	-	-	-

GH-D : growth hormone deficiency ; TSH-D : TSH deficiency ; ACTH-D : corticotrop deficiency ; HPL : hyperprolactinemia ; Gon-D : gonadotrop deficiency ; CPP : central precocious puberty ; DI : diabete insipidus ; na : not available.

## References

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