

## HYPOTHALAMIC TUMOR ASSOCIATED WITH ATYPICAL FORMS OF ANOREXIA NERVOSA AND DIENCEPHALIC SYNDROME

EUGENIO CHIPKEVITCH\*, ANTONIO C.L. FERNANDES\*

---

**SUMMARY** — We report the case of a 10-year-old girl with a mature teratoma in the hypothalamic region. The patient presented a 2-month history of anorexia, psychic disturbances and a 37% loss of body weight. These symptoms had led initially to a diagnosis of major depression and atypical anorexia nervosa. She also presented some signs and symptoms of diencephalic syndrome. This case illustrates the importance of considering a slow-growing mass as a rare but real possibility in the differential diagnosis of anorexia nervosa, mainly in atypical cases.

**KEY WORDS:** hypothalamic tumor, teratoma, anorexia nervosa, diencephalic syndrome.

**Tumor hipotalâmico associado a formas atípicas de anorexia nervosa e síndrome diencefálica.**

**RESUMO** — Os autores relatam o caso de uma menina de 10 anos de idade com teratoma maduro na região hipotalâmica. A paciente apresentava história de 2 meses de anorexia, distúrbios psíquicos e perda de 37% de seu peso. Tais sintomas levaram inicialmente ao diagnóstico de depressão maior e anorexia nervosa atípica. Ela também apresentava alguns sinais e sintomas da síndrome diencefálica. O caso ilustra a importância de considerar tumores de crescimento lento como possibilidade rara, embora real, no diagnóstico diferencial de anorexia nervosa, particularmente em casos atípicos.

**PALAVRAS-CHAVE:** tumor hipotalâmico, teratoma, anorexia nervosa, síndrome diencefálica.

---

Anorexia nervosa (AN) occurs mostly in adolescent girls and its diagnosis requires the presence of: (1) weight loss leading to a weight 15% below that expected, (2) fear of obesity, (3) disturbance of body image, and (4) amenorrhea<sup>2</sup>. Structural brain lesions have not been found in these patients, but there have been some reports<sup>7,8,14</sup> of brain tumors whose initial symptoms had led to the diagnosis of AN. The best known association between cerebral tumors and emaciation in childhood is the diencephalic syndrome (DS)<sup>1,5</sup>. DS is generally caused by gliomas in the hypothalamic (HT) and chiasmatic regions and is associated with the presence of extreme cachexia, hyperactivity, cheerful affect, euphoria and alert appearance<sup>5</sup>. Most children with DS are 6 to 18 months old, and are not anorexic<sup>1</sup>.

Association of DS with typical features of AN syndrome had not been described. We report a case of a 10-year-old girl with teratoma in the HT region, whose clinical presentation had initially led to the diagnosis of AN, and who also presented some elements of DS.

### CASE REPORT

EVL, a white, middle-class 10-year-old girl, presented a 2-month history of anorexia and progressive emaciation, having lost 12 Kg (37% of her original weight). The anorexia had begun after the girl had witnessed a fight between her grandparents. The patient was the

---

\*Division of Adolescent Medicine, Darcy Vargas Children's Hospital (SUDS), São Paulo. Aceite: 03-agosto-1992.

oldest of 3 daughters. Her neuromotor development was normal, with the exception of a secondary nocturnal enuresis since 4 years of age. Her mother thought she have been drinking too much liquid since this age. She denied headache, visual disturbances or any interruption of growth. Her parents described her as having always been introverted, quiet, perfectionist and high-achiever. Her father was an alcoholic and, when drunk, arrived home aggressive, fighting with his wife. After the patient had become anorexic, he stopped drinking completely, concerned that his daughter's illness could be his fault. The girl began to eat more when fed by him. She had always been "demanding" in her eating habits, being very selective, but used to eat well. Since the onset of anorexia she often made comments about food, opening the refrigerator, showing interest in food but not eating it spontaneously. She was completely indifferent to her intense emaciation, but had never showed any desire to diet or to exercise, nor any concern as to her weight.

At physical examination, the patient was emaciated and pale. Weight 20 Kg (below 3rd percentile), height 132 cm (25th percentile, both parent's height being at the same percentile). Head circumference 50.5 cm (below 50th percentile). Tanner stage  $M_2P_1$ . Heart rate 80, and blood pressure 70x50. The neurological examination was normal. At psychiatric exa-

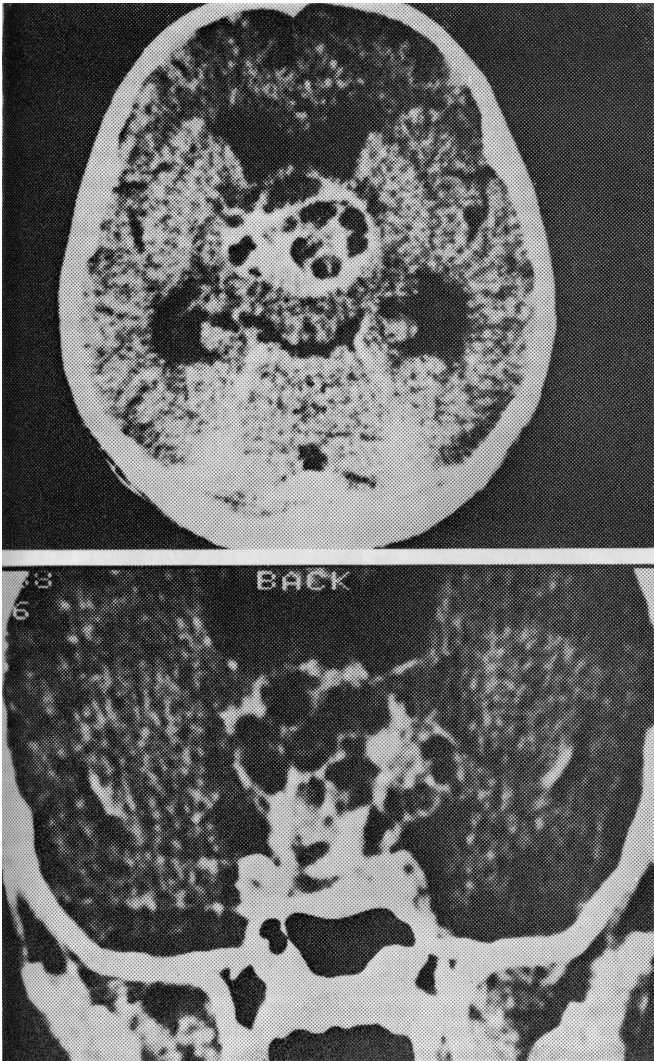


Fig. 1. Case EVL. CT scans of the patient (above, axial and below, coronal views), demonstrating a suprasellar mass.

mination, the patient was passive, apathetic and somnolent, with minimal attention span. She showed periods of hyperactivity, waving her arms or compulsively counting numbers or objects around her. Although the patient did not meet all the DSM-III-R<sup>2</sup> criteria for AN, the presence of various psychodynamic elements suggested a diagnosis of atypical AN associated with a major depression. Hemoglobin, hematocrit and blood cell count were normal, as well as serum potassium, chloride, calcium, phosphorus, BUN, creatinine, glucose, and urinalysis. Magnesium (1.3 mEq/L) and albumin (2.8 g/dL) were low. Serum sodium (149 mEq/L) and osmolality (302 mOsm) were slightly elevated, and urine osmolality was low (268 mOsm, after fluid restriction). Visual acuity was 0.9 for the right and 1.0 for the left. The fundus examination showed slight papilledema in the right. Skull X-ray was normal, except for a possible enlargement of the sella turcica. There were no calcifications nor erosion of the sella. CT scan (Fig. 1) disclosed the presence of an expansive suprasellar lesion, irregularly oval, with cystic areas in its interior.

The patient was transferred, after 5 days, to the Neurosurgical Unit of the São Paulo University Hospital. Her general status was deteriorating, and she showed signs of organic brain syndrome. She accepted almost nothing by mouth and vomited after being fed. Her hyperkinesia aggravated, with involuntary, rhythmical, irregular movements of the extremities. The muscular strength and tonus were diminished and there were a multidirectional nystagmus and palpebral retraction. The cerebrospinal fluid examination showed 11 leucocytes, normal glucose and increased proteins (96 mg/dL). Stereotaxic biopsy of the hypothalamus showed proliferation of astrocyte-like, fusiform cells, and presence of nests of epithelial cells and corneal globes. The scarcity of material prevented a definite histological diagnosis. After the biopsy, the patient's neurological status deteriorated, she developed a pulmonary infection, and finally died. Unfortunately, the endocrinological study could not be completed. On admission, T3, T4 and TSH were normal and prolactine was slightly elevated (32 ng/mL).

At necropsy, the brain weighed 1200 g, showing a tumor protruding on the floor of the 3rd ventricle and forcing the chiasm forward. On sagittal section (Fig. 2) the tumor was encapsulated, well circumscribed, measuring 3.5x3.0 cm, with petrous consistence. Inside there were hemorrhagic areas, and other areas were cystic containing a greenish coagulated liquid. On histological examination, the tumor consisted of various different kinds of tissue: cartilage, glands, respiratory and intestinal epithelium, fibrous tissue, papillary formations, smooth muscular and nervous tissue. The diagnosis was of a mature teratoma of the 3rd ventricle.

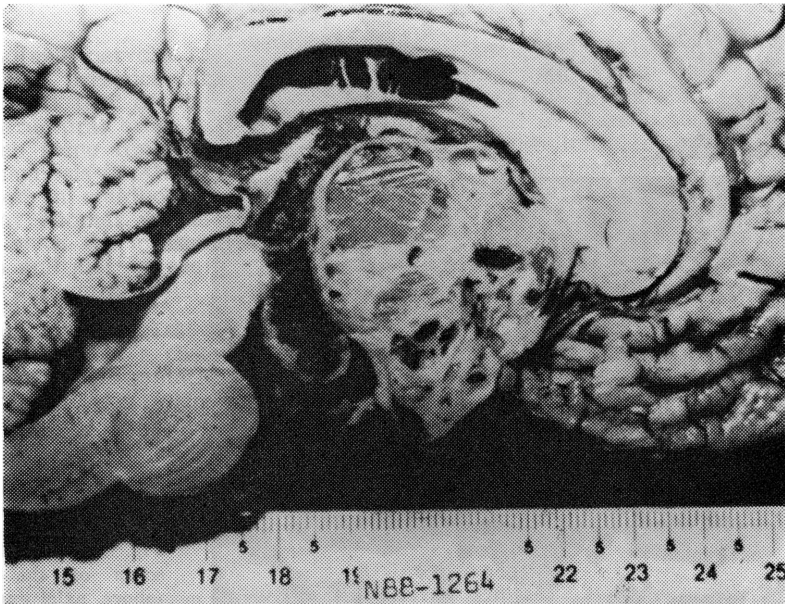


Fig. 2. Case EVL. Sagittal section of the patient's brain seen at autopsy, showing a cystic tumor invading hypothalamic region and compressing the 3rd ventricle.

## COMMENTS

AN is generally believed to be primarily a psychogenic disorder being the concomitant HT dysfunctions attributed to starvation<sup>4</sup>. Nevertheless, the frequent occurrence of amenorrhea prior to weight loss and the persistence of this and some other endocrine and neurochemical abnormalities after weight recovery support the possibility of a primary HT disorder<sup>11</sup>. Although anatomic lesions of the HT have not been found in patients with this disease, some cases have been reported<sup>7,8,14</sup> in which AN was associated with or suspected prior the diagnosis of a brain tumor.

Our patient presented many characteristics suggesting the diagnosis of AN. Her symptoms also fulfilled DSM-III-R criteria<sup>2</sup> for major depressive disorder. Depression and other psycho-affective disorders are often found to be associated with AN<sup>12</sup>. These characteristics of our patient, associated with depression, and the absence of both distorted body image and fear of obesity, suggested an atypical AN<sup>4</sup>.

Our patient also presented some signs observed in the DS: hyperkinesia, nystagmus, palpebral retraction, diabetes insipidus, pallor without anemia, vomiting, hydrocephalus, papilledema and elevated concentration of cerebrospinal fluid protein<sup>1,5</sup>. We did not consider her as having a classic DS because of her age, intense anorexia, and depression instead of euphoria. Most children with DS are euphoric and cheerful, not anorexic, and less than 3 years old<sup>1,5</sup>. Identical tumors in older children usually manifest themselves through obesity, precocious puberty, hypogonadism, but not emaciation. However, the DS is probably a much lesser homogeneous condition that it is generally believed<sup>5</sup>. Some reviews have reported that about 40% of the cases were anorexic and about one-fourth were not hyperactive nor euphoric<sup>1</sup>.

It is interesting to note that some symptoms, such as hyperactivity and signs of autonomic imbalance, are observed both in AN and DS, perhaps due to dysfunctions in the same HT areas. Our case is curious in that it presents a diencephalic-like syndrome at this age, and that it manifests features of both AN and DS: an association that we could not find in the literature. It is also singular for being a teratoma associated with anorexia and emaciation. Emaciation was sometimes described in association with the suprasellar germinoma<sup>9</sup>, but not with teratoma.

The symptoms presented by our patient can be attributed to an extensive HT damage. It is known that experimental lesions of lateral HT lead to aphagia and emaciation<sup>3</sup> as also adipisia, finickiness and motor disturbances<sup>13</sup>. Damage to the posterior HT can lead to hypersomnia disturbances of conscience and apathy<sup>6</sup>, which were present in our patient. Her periods of hyperkinesia could be explained by the damage to the limbic inputs to the HT<sup>6</sup>. Periods of hyperactivity are also observed in lateral HT syndrome<sup>13</sup>, and stereotyped somatic movements can also be elicited in animals by stimulation of the posterior HT<sup>6</sup>.

The peak occurrence of intracranial germ-cell tumors is at the age of 10-12<sup>10</sup>. Their most usual localization is in the pineal and suprasellar region both involved in the regulation of gonadotrophic activity, which increases at puberty, as does the secretion of growth hormone. This sharply defined age range and the specificity of site of origin suggest that the pubertal neuroendocrine events could activate the growth and the expression of malignant behaviour of these intracranial embryonal tumors<sup>10</sup>. The clinical evolution of our patient is compatible with this hypothesis.

This case illustrates the importance of considering a slow-growing brain mass as a rare but real possibility in the differential diagnosis of AN, mainly in atypical cases, which do not fulfil all the DSM-III-R<sup>2</sup> criteria.

Aknowledgements — We thank Drs. Hamilton Matushita and Nelio Garcia de Barros, from the Departments of Neurosurgery and Neuroradiology of the São Paulo University Clinical Hospital, for providing data on the patient's internation at their unit.

## REFERENCES

1. Addy DP, Hudson FP. Diencephalic syndrome of infantile emaciation: analysis of literature and report of further 3 cases. *Arch Dis Child* 1972, 47:338-343.
2. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. Ed 3, rev. Washington DC: American Psychiatric Association, 1987.
3. Anand BK, Brobeck JR. Hypothalamic control of food intake in rats and cats. *Yale J Biol Med* 1951, 24:123-140.
4. Bruch H. Eating disorders: obesity, anorexia nervosa and the person within. New York: Basic Books, 1973.
5. Burr IM, Slonim AE, Danish RK. Diencephalic syndrome revisited. *J Pediatr* 1976, 88:439-441.
6. Carmel PW. Surgical syndromes of the hypothalamus. *Clin Neurosurg* 1980, 27:133-157.
7. Climo LH. Anorexia nervosa associated with hypothalamic tumor: the search for clinical-pathological correlations. *Psychiat J Univ Ottawa* 1982, 7:20-25.
8. Hollatz F, Ziolkó HU. Zur Differentialdiagnose der Anorexia Nervosa. *Munch Med Wschr* 1976, 118:263-266.
9. Imura H, Kato Y, Nakai Y. Endocrine aspects of tumors arising from suprasellar, third ventricular regions. *Progr Exp Tumor Res* 1987, 30:313-324.
10. Jennings MT, Gelman R, Hochberg F. Intracranial germ-cell tumors: natural history and pathogenesis. *J Neurosurg* 1985, 63:155-167.
11. Plum F, Van Uitert R. Nonendocrine disease and disorders of the hypothalamus. In Reichlin S (ed): *The hypothalamus*. New York: Raven Press, 1978, p 415-474.
12. Schwabe AD, Lippe BM, Chang J. Anorexia nervosa. *Ann Intern Med* 1981, 94:371-381.
13. Teitelbaum P, Epstein AN. The lateral hypothalamic syndrome: recovery of feeding and drinking after lateral hypothalamic lesions. *Psychol Rev* 1962, 69:74-90.
14. Weller RA, Weller EB. Anorexia nervosa in a patient with an infiltrating tumor of the hypothalamus. *Am J Psychiatry* 1982, 139:824-825.