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606

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Intracranial Germ Cell Tumor Mimicking Anorexia Nervosa

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Summary. A previously healthy seventeen-year-old boy developed loss of weight, poor appetite, and aversion to food. Physical examination being normal, anorexia nervosa was suspected. Thirteen months later a CT scan revealed a mass in the third ventricle histologically proven to be a malignant teratoma. To our knowledge anorexia nervosa is only extremely rarely the presenting feature of intracranial germ cell tumors.

Key words: Anorexia nervosa – Teratoma – Intracranial germ cell tumor

The incidence of intracranial germ cell tumors ranges from 0.4% to over 3.4% with a marked preponderance of males and a typical age distribution with greatest incidence in the first three decades [6]. Of these tumors, 60–80% are located in the pineal and parapineal region; 20% affect other areas, particularly the hypothalamus [6].

Anorexia nervosa was described for the first time by Sir William Gull in 1868 [8]. It is characterized by extreme weight loss, body-image disturbance, and intensive fear of becoming obese, adolescent girls and young women being primarily affected [5]. Morbidity and mortality rates in anorexia nervosa are among the highest recorded with psychiatric disorders [5].

Several authors have described the pathology of midline tumors and signs and symptoms of neuroendocrine dysbalance [3, 4, 6, 9].

We report on a patient with a midline brain tumor, who presented clinically with an anorexia nervosa-like syndrome.

Abbreviations: CT = computerized tomography; MRT = magnetic resonance tomography; TR = relaxation time; TE = echo time; ms = millisecond

Case Report

A previously healthy boy started to develop physical and mental changes at the age of 17, when he decided to quit high school and start working as a carpenter. Up to this time he had been attending school with good marks, he had had normal social contacts, and there was no history of birth trauma or congenital defect. The boy became lethargic and weak and he developed an extreme aversion to food. Except for signs of malnutrition, physical examination and routine laboratory findings were normal, but his psychological attitude seemed to have changed. Some weeks later an appendectomy was performed because of diffuse abdominal pain, nausea, and vomiting. Over a period of 6 months he lost 19 kg and the diagnosis of irritable colon and anorexia nervosa was made. A psychiatrist put the patient on antidepressive agents, but his psychological condition continued to deteriorate. The boy stopped working, he became increasingly isolated, and significant decline in memory functions became obvious.

One year after the first signs and symptoms had been noticed, he fell acutely ill, complaining of headache and suffering from excessive vomiting. Anorexia nervosa having been suspected, he was sent to the university psychiatry clinic. A computerized tomography (CT) revealed a mass in the anterior part of the third ventricle extending to the chiasmatic cistern. Neurologically the patient was stuporous and disoriented, pupils were different in size, reaction to light was sluggish, and there was an incomplete paresis of upward gaze. The muscle tone was increased, the tendon reflexes were brisk, and bilateral extensor plantar responses were observed. Physical examination showed a pale, emaciated boy with dry skin and sparse pubic and axillary hair.

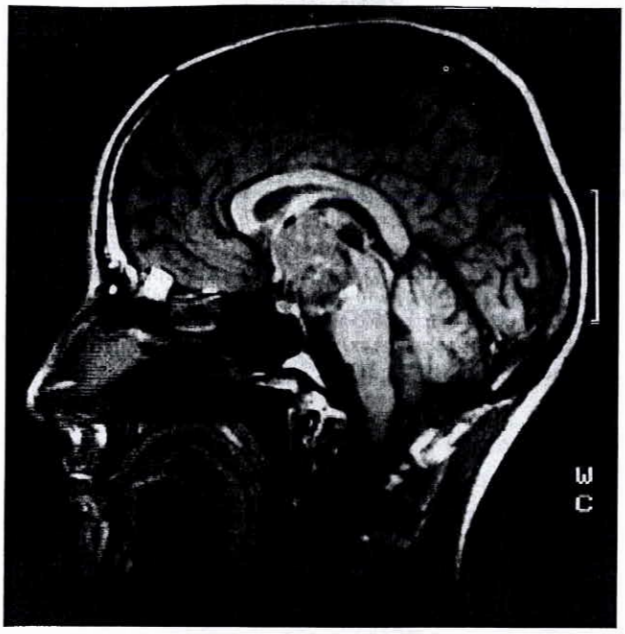

Fig. 1. Sagittal T_1 weighted image (TR = 460 ms, TE = 15 ms): Well circumscribed, large, solid suprasellar tumor mass with heterogeneously mixed increased and decreased signal intensity. The tumor extends into the third ventricle and compresses hypothalamic nuclei and the upper brainstem

The findings of magnetic resonance tomography (MRT) of the brain are shown in Fig. 1.

Pituitary function tests revealed partial anterior pituitary insufficiency including the thyreotropic and gonadotropic systems; the results on the corticotropic system were borderline low. Estrogen and human chorionic gonadotropin levels were elevated and hyperprolactinemia and diabetes insipidus were concomitantly present.

Based on MR appearances and on neurological and endocrinological data, a clinical diagnosis of midline brain tumor was made. Pathology results indicated an epidermoid tumor.

Therapy with hydrocortisone, arginine-vasopressin, and testosterone was instituted and a right frontal craniotomy with removal of the tumor was performed. Histological diagnosis was malignant teratoma of the trophoblastic type.

Postoperatively the patient was in a chronic vegetative state. He then developed a deep vein thrombosis and pulmonary embolism. Due to his condition radiation therapy could not be initiated. The patient died eight weeks after the operation.

Discussion

Although there are numerous reports about midline brain tumors, a clinical pattern resembling anorexia nervosa seems to be a rare form of presentation [1, 2].

In reviewing our patient's history we notice that remarkable behavioral changes and changes in his eating habits occurred very early in the course of his illness. He began to feel overburdened, he quit school, he became withdrawn, his appetite decreased, and there was rapid weight loss with signs of emaciation. Comparing the signs and symptoms of our patient with the diagnostic criteria of anorexia nervosa, we must admit that there are many similarities, but there are also some important aspects which should have led to early differential diagnostic considerations. Firstly, anorexia nervosa is nearly always seen in young women; secondly, patients suffering from anorexia nervosa are usually hyperactive, whereas our patient became extremely tired, weak, and lethargic; and thirdly, in our patient there was no evidence of mental signs, such as distorted body image and self-induced vomiting, or physical signs, such as lanugo hair, bradycardia, and hypothermia [7]. Anorexia nervosa should be diagnosed only if physical illness can be excluded with a very high degree of certainty, primarily by means of a CT scan, particularly if headache and vomiting are intermittently present.

The time-lag between endocrinological and neurological symptoms has already been described by various authors [1, 9, 10], but it has not yet been emphasized that behavioral changes mimicking the clinical picture of anorexia nervosa may herald the neurological symptoms.

In light of the results of endocrinological tests and the presence of hyperprolactinemia, a hypothalamic origin must be suspected for partial pituitary insufficiency.

With the exception of oculomotor dysfunction, neurologic abnormalities are rather infrequent at the time of presentation [9, 10], the involvement of the posterior part of the third ventricle being responsible for Parinaud's syndrome and loss of light reflex [1, 10]. In our patient, the anterior part was primarily involved, which might explain the rather mild paresis of upward gaze.

Mental disturbances may appear in patients with germ cell tumors which infiltrate the surfaces of the ventricular system [4]. It is also well known that food intake is regulated by different structures of the hypothalamus [3], and that lesions involving the hypothalamus or the third ventricle may be responsible for malnutrition syndromes [3]. Nevertheless, some unanswered questions remain as to the anatomic basis for the psychological abnormalities observed in our patient. It should be stressed

that not only endocrinological symptoms, but also anorexia nervosa-like signs and symptoms may indicate the presence of a germ cell tumor of the brain.

References

1. Aichner F, Mayr U, Skrabal F, Fritsch E, Poewe W, Twerdy K (1984) Atypical pineal teratoma: clinical and computertomographic features of two patients with disseminated ependymal lesions. Neurochirurgia (Stuttg) 27:120–124
2. Biebl W, Platz Th, Kinzl J, Aichner F (1984) Ein Fall von männlicher „atypischer Anorexia nervosa": Tumor im Bereich des 3. Ventrikels. Nervenarzt 55:265–268
3. Boshes B (1969) Syndromes of the diencephalon: the hypothalamus and the hypophysis. In: Vinken PJ, Bruyn GW (eds) North-Holland, pp 432–468
4. Dayan AD, Marshall AHE, Miller AA, Pick FJ, Rankin ME (1966) Atypical teratomas of the pineal and hypothalamus. J Pathol Bacteriol 92:1–28
5. Herzog DB, Copeland PM (1985) Eating disorders. N Engl J Med 313:295–303
6. Jellinger K (1973) Primary intracranial germ cell tumors. Acta Neuropathol (Berl) 25:291–306
7. Marazzi MA, Luby ED (1989) The neurobiology of anorexia nervosa: an auto-addiction? In: Cohen MP, Foa PP (eds) The brain as an endocrine organ. Springer, New York Berlin Heidelberg, pp 46–95
8. Mc Cullagh EP, Tupper WR (1940) Anorexia nervosa. Ann Intern Med 14:817–838
9. Puschett JB, Goldberg M (1968) Endocrinopathy associated with pineal tumor. Ann Intern Med 69:203–219
10. Swischuk LE, Bryan RN (1974) Double midline intracranial atypical teratomas. A recognizable neuroendocrinologic syndrome. AJR 122:517–524

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Buchbesprechung

G. Möller (ed.) **Immunological Reviews, vol. 115: Concepts in Immunology.** Munksgaard, Copenhagen 1990. 262 pages, Subscription price 1990 (6 volumes per year) DKK 1465.00 including postage. USA, Canada and Japan: DKK 1525.00 including postage and air freight.

This volume is an attempt "in opening a new format to carry out a thoughtful unhurried scientific discussion without jet lag and the distraction of a big conference", – as the editor of the series, Göran Möller, states it.

The central part is a long paper of M. Cohn and R.E. Langman on "The Protection: the unit of humoral immunity selected by evolution" (142 pages). It critically reviews present theories and proposes an alternative system. Its central idea is that the humoral immune system must be modular. The module = *the Protecton* is defined "as the smallest sample of B-cells and humoral antibodies that retains all of the properties of the whole". It is supposed to be the same in organisms of any size, differing only in the number of units. The authors postulate a quantitative model and attack the presently accepted notions of almost unlimited capabilities to make specific antibodies, e.g. assuming the minimal effective Ig concentration against every single antigen to be 10 ng/ml, and the amount of antibody produced by the 10^7 B-cells/ml, and they calculate that sufficient antibody production (10–100 ng/ml) will need 8.5–11–13.5 days. – Based on such assumptions and with particular concern to evolutionary aspects, the authors have build up a comprehensive computer program making the Protecton theory "a valid competing concept".

The draft of this paper was submitted to 8 leading immunologists (*Nossal, Coleclough, Ohno, Paul, Klinman & Decker, Pink, Dintzis & Dintzis, Storb*), who after careful study made their remarks: All of them agree about the merits of *Cohn & Langman* (*Nossal:* "I sometimes think that, if they did not exist, we would have to invent them!"), but each of them pronounces some critique, partly concerning misinterpreted experimental data, partly the theory itself. Each of these contributions is again followed by a response (or defense?) of the original authors in which they try to clarify their standpoint.

Obviously, this is not an easy reading, and the reviewer admits that many of the arguments were above his head. It seems, however, quite clear that this format may indeed be an improved possibility to discuss basic problems at depth, giving full consideration to the ideas of other research groups. – The book is recommended for extensive study to basic immunologists, but also to other scientists with an interest in the philosophical background of modern science, if they have sufficient knowledge of the subject.

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