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'HALLERVORDEN-SPATZ SYNDROME - INFANTILE NEUROAXONAL DYSTROPHY' COMPLEX

CASE REPORT

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SUMMARY — Case report of a 7 1/2-years old girl considered as being normal until the age of 2 years. From then on she progressed with gait disturbance, mental deterioration, dystonic movements, convulsions and dysarthria. She died of bronchopneumonia one year later. CT scan showed hyperdensity at the putamina, with no signs of cerebral atrophy. Pathological examination disclosed an intense red coloration of the putamina and axonal «spheroids» at electron microscopy.

Complexo «síndrome de Hallervorden-Spatz — distrofia neuroaxonal infantil».

RESUMO — A síndrome de Hallervorden-Spatz bem como a distrofia neuroaxonal infantil são patologias raras e os limites entre ambas são ainda imprecisos. Apresentamos o caso de menina de 7 anos e meio com rebaixamento mental, distonia, crises convulsivas e coriorretinite. CT mostrava hiperdensidade dos putâmens, sem sinais de atrofia cerebral. Ao exame anatomopatológico observou-se intensa coloração avermelhada dos putâmens, porém com ausência de pigmento férrico. À microscopia eletrônica foram observados os «esferóides» axonais. Por haver características de ambas as patologias, registramos este caso, como complexo «síndrome Hallervorden-Spatz-distrofia neuroaxonal infantil».

The Hallervorden-Spatz syndrome (HSS) and the infantile neuroaxonal dystrophy (NAD) are uncommum diseases. For this reason it is difficult to study their tomographic characteristics. Adams & Lyon [1] state that the most striking feature in NAD (Seitelberger disease) is the cerebellar atrophy. This has also been described by Rosemberg et al.[9] in their study of three cases. Hyperdensity of the basal ganglia was described only by Zimmerman et al.[12] in their two HSS cases, one of them associated with cerebral atrophy.

We report the case of a patient with clinical signs of HSS, whose CT scan showed hyperdensity in the putamen and an intense red coloration of the putamen at pathological examination. This showed no iron pigment, but axonal dilatations called "spheroids". In our case, CT scan characteristics sign of HSS were present together with pathological abnormalities of NAD.

CASE REPORT

A.O., a 7-years 6-month old white girl was the second daughter of non-consanguineous parents, with no previous familial neurological diseases. She had a normal 9-years old brother. There were no pre-natal or natal abnormalities. Her neuro-psychological development

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was considered normal until the age of 2 years. From this time on a progressive impairment in deambulation and spasticity were noted, as well as difficulty in prehension and verbalization. This progressed slowly and at the age of 6 years she started with abnormal movements in the four limbs and seizures. At this time she was put on diphenylhydantoin. When first seen, at the age of 7 1/2 years, several frontal scars were present, with underlying bony protusions, caused by multiple accidental falls. She was alert, but with marked mental impairment. Her verbal comprehension was very poor and limited to few simples orders. CP=53 cm. Her vocalization was limited to simple sounds. Abnormal dystonic movements were present and they made any voluntary movement impossible (Fig. 1). Fundoscopic

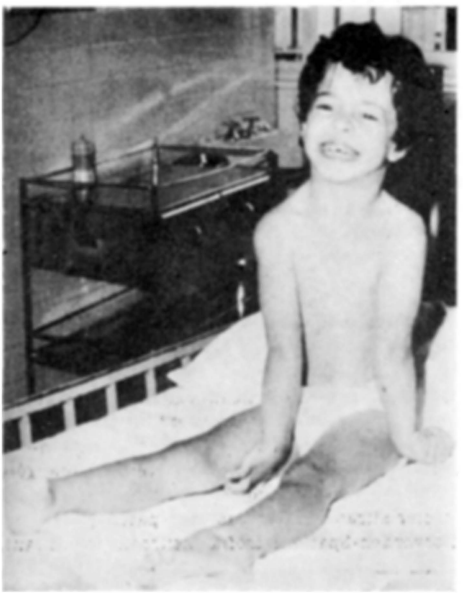

Fig. 1 — Case AO: Dystonia.

examination disclosed an area of retinitis pigmentosa on the anterior portion of the equator. Laboratory exams were normal. including complete blood count, immuneglobulins, A-aryl-sulfatase, A-and B-hexosaminidase, ceruloplasmin, Cu, Fe, lipids, myelogram, caryotype, urine, stool, EKG, EEG, CSF (with immunological reactions, electrophoresis and immuneglobulins) and inborn metabolic errors exclusion. Cytoplasmatic vacuoli were found in 20% of monocytes. CT scan showed hyperdensity in the putamina, with no signs of atrophy (Fig. 2). The patient was followed during the period of one year. The dystonic movements increased and took the pharyngeal muscles. Her mental status deteriorated to the point of complete lack of contact. Seizures disappeared with the use of carbamazepine. Vitamins A and E, as well as benzodiazepines, did not show any benefits to her clinical picture. She died of bronchopneumonia at the age of 8 1/2-years.

Pathological examination — Macroscopic examination disclosed an apparently normal brain, with 1260 g of weigth. Sagital cuts, however, disclosed an intense red coloration of the putamina. We could not demonstrate any iron pigment in them (Perls). Optic microscopy with hematoxilin-eosin showed small round acidophilic formations, strictly limited to the fibers radiating from both putamina. This could represent axonal spheroids (Fig. 3). Electron microscopic examination showed abnormal myelin sheets with axonal dilatation between them (spheroids) and normal mitochondria (Fig. 3).

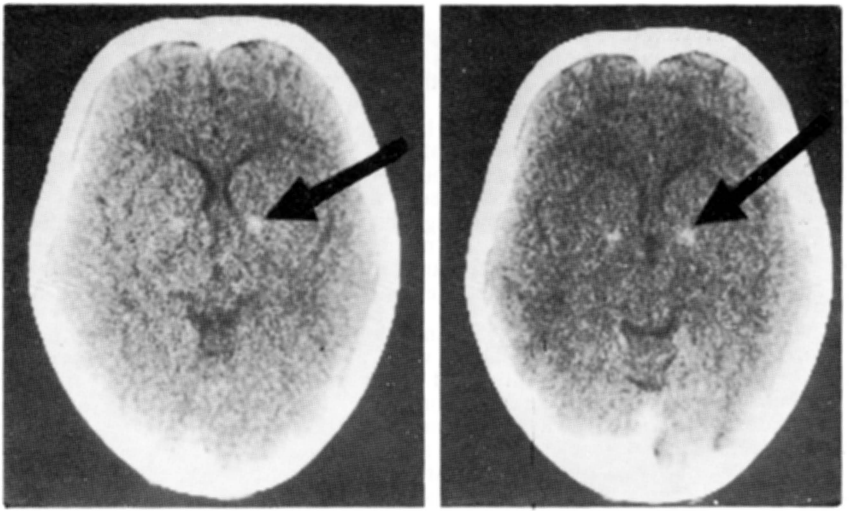

Fig. 2 — Case AO. Left: CT scan showing hyperdensity in the putamina. Right; axial contrast-enhanced CT shows no enhancement of putamina hyperdensity.

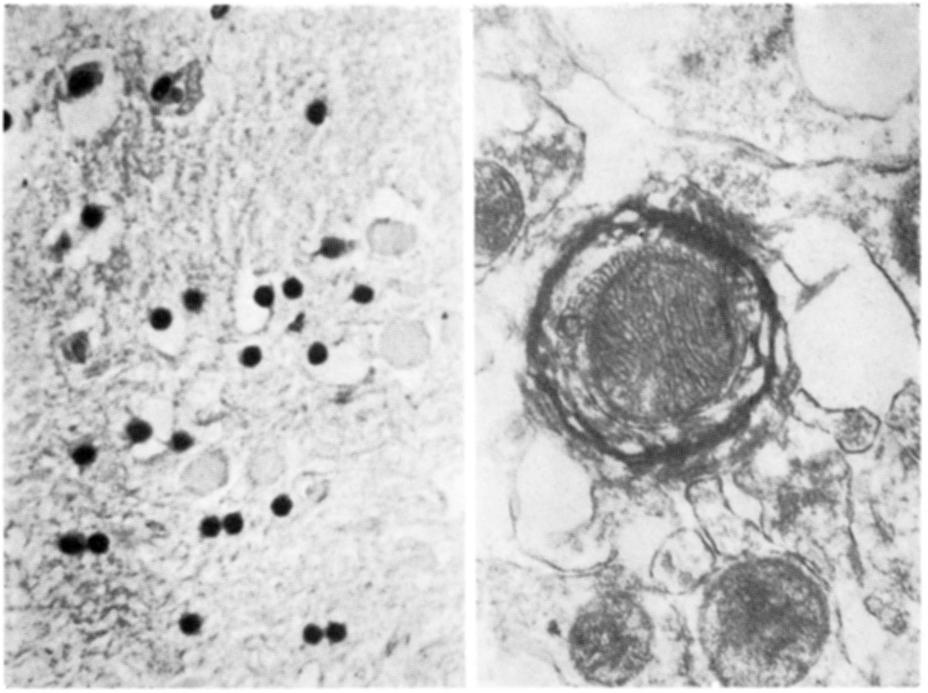

Fig. 3 — Case AO. Left: photomicrography (putamina) showing small round acidophilic formations (H.E., ×160). Right: electron micrography (putamina) showing axonal dilatation (spheroid) and normal mitochondria (×28500).

COMMENTS

The clinical picture present in our patient did not reach the criteria established by Aicardi and Castelein [2] for the diagnosis of the so-called "pure form" of the infantile neuroaxonal dystrophy. This is due to the fact that our patient presented rigidity, distonic posture, convulsions and retinitis pigmentosa. These are more common in the Hallervorden-Spatz syndrome, as it has been described in the literature [1,3,11]. Swaiman et al.[10] described the presence of sea blue histiocytes in the bone marrow, as well as vacuolized lymphocytes in the peripheral blood of patients with HSS. In our case, cytoplasmic vacuoli were present in 20% of the monocytes. CT scan in patients with NAD is described as showing only cerebellar atrophy [1,9]. In those with HSS, CT scan has been described as normal [1], or with clear subcortical atrophies [4], or even with hyperdensity at the basal ganglia [12]. The closer CT scan aspect to our case is the one described by Zimmerman et al.[12] in their two HSS cases.

The pathological aspects of HSS include iron pigments mainly at the globus pallidus and substancia nigra [1,2,8]. These were absent in our case. The presence of axonal spheroids in the basal ganglia and lower part of the neuroaxis is in contrast with its almost absence in the cerebral cortex. Their origin is unknown and it has been speculated in different ways. Herman et al.[6] believe their origin is at the synaptic vesicles. Recent studies showed a markedly increased enzymatic activity of a non specific esterase and of the NADH-tetrazolium reductase [5]. This was topically correlated with the central nervous system spheroids. The pathological findings in our patient suggest the diagnosis of NAD, but the clinical picture and the CT scan suggest a HSS case.

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