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### **Neuropsychological Analysis of the Consequences of Intracerebral Haematoma with Frontal Localization**

Neuropsychologiczna analiza następstw krwiaków śródmózgowych o lokalizacji czołowej

In recent years an interest in functional brain asymmetry in injuries of one of cerebral hemispheres has increased. In unilateral frontal pathology the best elaborated is the symptomatology concerning the injury of left cerebral hemisphere: relatively well-known injuries are: motor and dynamic aphasia, psychomotor hypokinesia, disorganization of thinking, verbal dysmnesia and emotional dullness (1, 6, 8). Whereas the consequences of right-sided frontal injury have been known to a smaller degree. The mainly described ones are: anosognosia, serious disturbance of emotional sphere, lowering of criticism with abnormal reference to his or her condition and environment (2, 4, 7).

In Neurology Clinic in Lublin was made an observation of two patients with intracerebral haematoma, localized within frontal lobes. It seemed purposeful to carry out an analysis of somatic and neuropsychological symptoms depending on the location of haemorrhagic foci and on their size.

#### CASE DESCRIPTIONS

A patient J. H., aged 39, a right-handed pensioner. In 1975 he had a heart operation and implantation of mitral valve, he was under permanent care of the cardiologic outpatient clinic and took antithrombotic drugs. He was admitted to Neurology Clinic in connection with a sudden occurrence of disturbances of consciousness of a high degree, preceded by a sudden intensive headache. The patient's general condition was severe, heart action was rhythmic, normally frequent, the systolic murmur at Erb's point and over aortic ostium (RR120/80) was auscultatorily audible.

By means of neurological examination the following deviations from the norm were found: limitation of consciousness, psychomotor hipokinesia, distinctly positive meningeal signs, grasping reflex, dysfunction of urinary bladder. On the account of the suspected intracerebral haemorrhage tomographic examination (CT) of the head was carried out; it showed in the basilar part of frontal

lobes an extensive hyperdense region of intracerebral haematoma nature, pressing and dislocating frontal horns of lateral ventricles, as well as cerebral oedema.

During medical treatment a gradual regression of changes tomographically found was observed. After 3 weeks the control treatment CT revealed a considerable decrease of intensity and extensiveness of haemorrhagic foci in frontal lobes. The oedema around the remnants of haemorrhagic foci in frontal lobes, specially on the right side, has remained. Cerebral ventricles within frontal horns were still pressed and slightly dislocated towards the back and to the left side. Tomographic examinations of the head carried out for 5 weeks from the beginning of the disease showed further gradual diminishing of the previously described changes. Neurological condition of the patient after finishing clinical observation was normal.

A patient B. S., aged 36, was admitted to Neurology Clinic in Lublin at medium serious general condition, conscious, normally coming into contact, however apathetic and somnolent. For 3 days before being admitted to the Clinic he suffered from very strong headaches, occurring mainly in frontal region. These ailments were accompanied by vomiting, nausea, increased temperature of the body up to 38°C, he suffered very much.

It resulted from his account he had sustained two injuries of the head: in October and December 1987. The injuries did not cause loss of consciousness. Post-traumatic scars of the occipital and frontal regions of the head were found, as well as painfulness on palpation and percussion of the skull, mainly over the orbital region and in the occipital region, and distinctly positive meningeal signs. The fundus of the eye was normal. The basic laboratory examinations did not prove any significant anomaly. The examination of cerebrospinal fluid showed features of haemorrhagic syndrome.

The CT brain examination displayed the presence of several foci of an increased density in the right frontal lobe and right infratemporal region surrounded by a small oedema zone, not showing contrast intensification, however, connected with a small mass effect. The angiography of the right internal carotid artery did not show the presence of vascular anomaly. The CT control examinations of the brain performed after 4 weeks showed a big regression of changes that had been previously found.

The condition of the patient has been improving systematically. He was discharged from the hospital in good health condition.

## DISCUSSION

Comparing the results of neuropsychological examinations carried out in the two patients one can notice both certain convergences and differences in the psychological picture.

In both patients dynamic apraxy has been found, however, in the patient with the right frontal lobe injury this dysfunction has been displayed selectively, namely while making alternating movements with both hands, whereas in the patient with both frontal injury this disturbance is more global. Moreover, in the patient with bilateral frontal lobes pathology apraxy of pose (kinesthetic) was found, consisting in disability to reproduce the right arrangement of the fingers.

In both patients similar dismnnesia and optional attention have occurred. Both patients had difficulties with keeping optional attention, and pathologically strengthened susceptibility to the side stimuli which projected on the course of mnesic activities.

However, in the patient with right-side injury, in the process of memorizing and reproducing, tendencies to casual associations and confabulation com-

plements have occurred. Whereas in the patient with bilateral frontal pathology passive fixation and pathological inertia of memory traces with characteristic inactivity and perseveration were found.

In the patient with bilateral injury of frontal lobes disorganization of thinking function consisted in the disturbance of plan realization and of organized mental activity, while the particular intellectual operations have been preserved. In the patient with the right hemisphere pathology no formal disturbances of thinking have been found.

Distinctly different was the emotional state of both patients. In the patient with the right-side injury of the brain an euphoric mood was observed, which was connected with unconcern and vivid, not controlled by intellect, emotionality, expressing rather superficial positive feelings.

In the patient with bilateral frontal injury dominated the mood of dullness, apathy and indifference which corresponds to the abulic-apathetic syndrome. Moreover, disturbances of criticism, lack of distance as well as smaller emotionality and disturbances of consciousness have been observed.

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#### STRESZCZENIE

Przedstawiono wyniki obserwacji 2 pacjentów leczonych w Klinice Neurologii AM w Lublinie z krwiakami śródmózgowymi zlokalizowanymi w obrębie płatów czołowych. Przeprowadzono analizę somatycznych i neuropsychologicznych objawów zależnie od lokalizacji ognisk krwotocznych i ich wielkości. W celu oceny dynamiki zaburzeń wyższych czynności psychicznych badania neuropsychologiczne przeprowadzono 2-krotnie: pierwsze — po upływie 2 tygodni od momentu hospitalizacji, powtórne — po upływie 1 miesiąca od badania pierwszego, a więc po 6 tygodniach od początku hospitalizacji.

