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Akademija nauka i umjetnosti Bosne i Hercegovine

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AKADEMIJA NAUKA I UMJETNOSTI BOSNE I HERCEGOVINE

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KNJIGA XVII

ODJELJENJE MEDICINSKIH NAUKA
KNJIGA 4.

MEĐUNARODNI SIMPOZIJUM

O EKSPERIMENTALNOM TREMORU

1 — 3. APRIL 1971. GODINE

Urednik
PAVEL ŠTERN,
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Bosne i Hercegovine

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H. HADŽISELIMOVIĆ

ASPECT OF THE EXTRAPYRAMIDAL NUCLEI IN RELATION TO THE CONFIGURATION OF THE HUMAN SKULL

Studying the appearance of the brain structures in relation to the configuration of the skull the appearance and the position of the extrapyramidal nuclei have been found by the author to depend on the type of brain resp. on the type of skull. According to various authors the extrapyramidal nuclei are formed by n. caudatus, putamen, globus pallidus, n. subthalamicus, n. ruber and n. niger. According to Spatz a closed functional apparatus, termed extrapyramidal motor system, is formed by the motor nuclei of the tectum, n. dentatus cerebelli, n. ruber, n. niger, n. subthalamicus, at last thalamus opticus, globus pallidus and the large ganglion masses of corpus striatum.

I was studying the asymmetry of the nuclei of the extrapyramidal system in relation to the asymmetry of the brain, i. e. in relation to the occipital, temporo-parietal and frontal portion of the skull.

Various authors were dealing with the asymmetry of the brain: Elliot-Smith (1907), Shindo (1913), Förtig (1922), Minkin (1929), Inglessis (1925), Karvé (1931), Ikeda (1931), Werner (1958), Hadžiselimović and Andjelić (1963) et al. Elliot-Smith (1907) established occipitopetalia on the left side in 80% of cases. Marked occipitopetalia is characteristic of Egyptian skulls. Förtig (1922) investigated lateral ventricles in 217 psychopaths. The left ventricle was found by Förtig to be larger than the right in 66.4% and smaller in only 17.5% of cases. In 77.8% of cases the left ventricle was wider than the right and more markedly retracted backward. The same asymmetry was established by the author in 28 normal individuals. The author considers the larger volume of the left hemisphere to be due to the functional superiority of the same hemisphere and this superiority to be expressed by an increased production of liquor.

MATERIAL AND METHODS

By measurement of the oblique skull diameters I determined the type of skull as well as the type of brain conform to it. The material used consisted of 500 randomized macerated and degreased skulls. On 250 brains, especially preserved, anatomical preparations were elaborated by careful dissection. On these preparations the appearance and

position of the extrapyramidal nuclei in relation to the configuration of the brain and type of skull were studied by the author.

RESULTS OF INVESTIGATIONS

ON 500 randomized macerated and degreased human skulls, I established by measurement of the oblique diameters entirely symmetrical skulls merely in 2 per cent. of the investigated cases. In 42 per cent. of the investigated cases I found occipital symmetry in association with temporo-parietopetalia either of the right or the left side. This temporo-parietopetalia may be associated with the frontopetalia either of the same or of the opposite side. Cases were found in which the occipital symmetry was associated only with the frontopetalia either of the right or left side as well (1.6 per cent).

In 36.8 per cent. of the investigated cases left occipitopetalia in conjuction with temporo-parietopetalia and in certain cases with frontopetalia either of the oposite or of the same side of the skull were established as well.

In 19.2 per cent. of the investigated cases I established right occipitopetalia either by itself or in association with prominences of the temporo-parietal and frontal portion either of the left or right side of the skull.

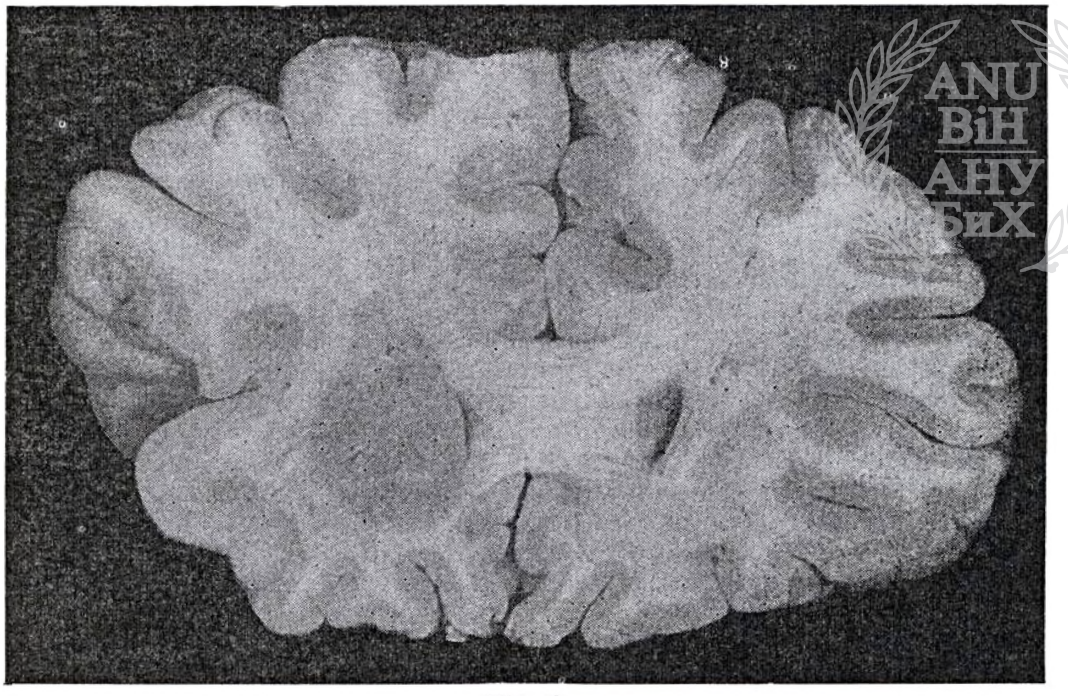

Fig. 1.

In the cases of occipital symmetry of the brain in association with temporo-parietopetalia of the right or left side, the extrapyramidal nuclei are situated laterally on the side of temporo-parietopetalia (42 per cent.).

In the cases of left occipitopetalia (36.8 per cent.) in association with right temporo-parietopetalia and right frontopetalia the extrapyramidal nuclei are retracted backward on the side of occipitopetalia. These nuclei are in antero-lateral position on the side of frontopetalia and temporo-parietopetalia. In the cases of right occipitopetalia (OPD, 19.2 per cent.) in association with left frontopetalia (FPS), the extrapyramidal nuclei are retracted backward on the right side and are situated antero-laterally on the left side.

On the frontal section through genu corporis callosi (Fig. 1) the antero-lateral position of n. caudatus on the left side i. e. on the side of frontopetalia and temporo-parietopetalia, is manifest. On the right side, on the side of occipitopetalia n. caudatus is not apparent. On the section through the anterior portion of corpus striatum (Fig. 2) the left

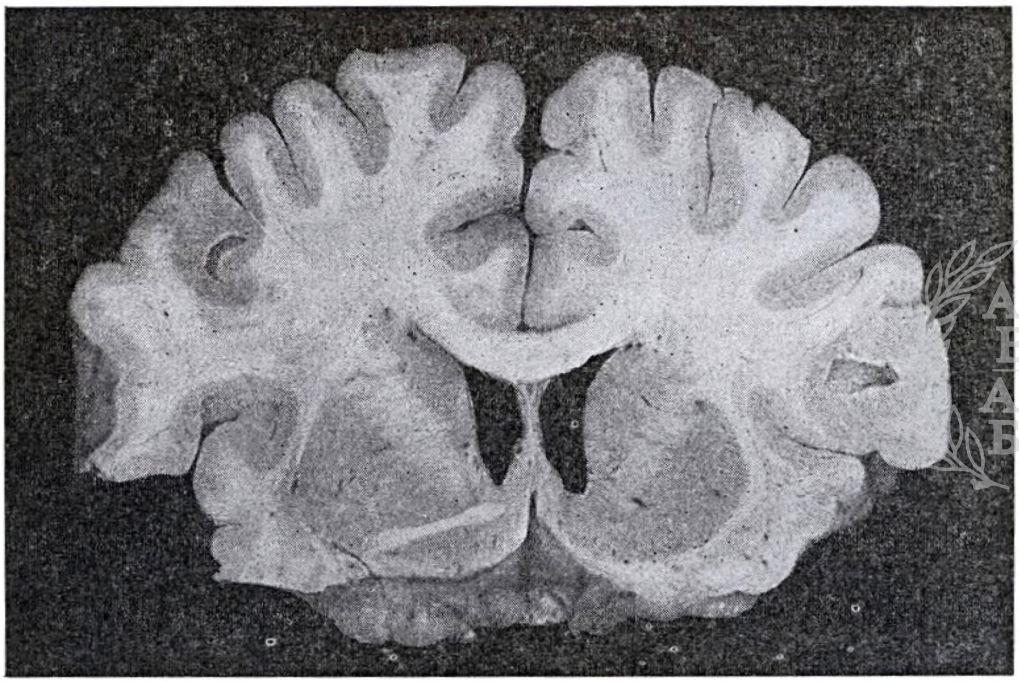

Fig. 2

caput of n. caudatus appears to be in an anterior position. On the left side i. e. on the side of temporo-parietopetalia globus pallidus which is missing on the side of occipitopetalia, is evident. On the right side, i. e. on the side of occipitopetalia on which all brain structures are retracted backward, n. caudatus and putamen are joined by their lower portions so that the internal capsule separates them incompletely. On the left side i. e. on the side of temporo-parietopetalia caput n. caudati is separated from putamen and globus pallidus by means of capsula interna and on that side the posterior portion of the anterior brain commissure is distinctly marked. On the frontal section through chiasma opticum (Fig. 3) n. lentiformis is more pronounced on the side of occipi-

Fig. 3

topetalia i. e. on the right side. On the frontal section through corpora mamillaria (Fig. 4) on the left side i. e. on the side of temporo-parieto-petalia and frontopetalia, n. subthalamicus, n. ruber and n. niger are

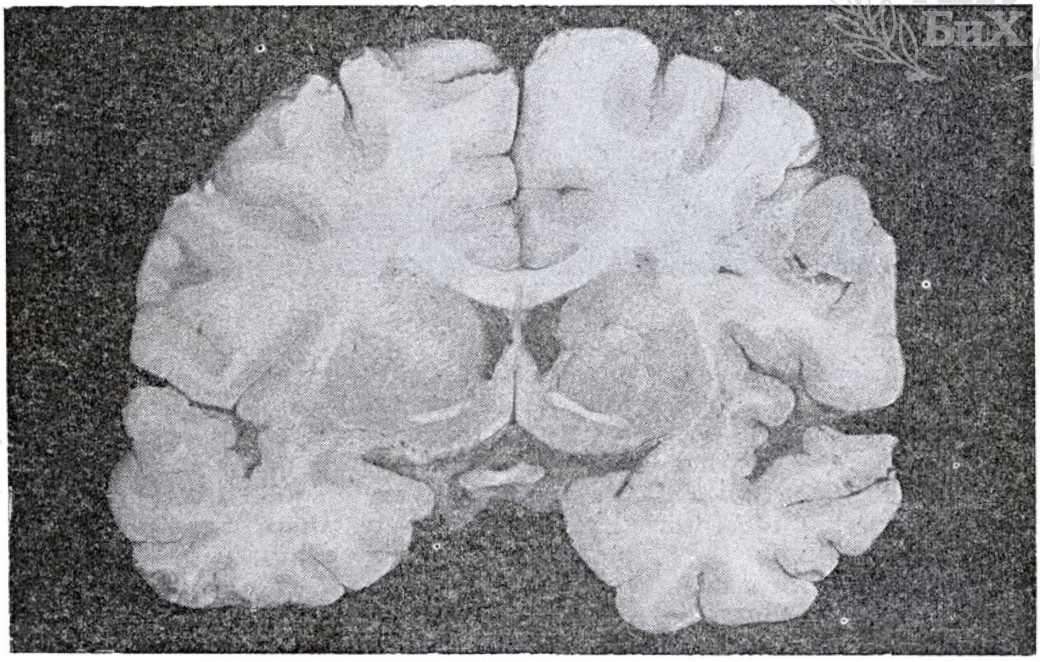

Fig. 4

more pronounced than on the side of occipitopetalia. On the right side i. e. on the side of occipitopetalia n. lentiformis and claustrum are well marked and on this side corpus amygdaloidum appears distinctly pronounced. On the horizontal section (Fig. 5) in the cases of left occipito-

Fig. 5

petalia in association with right temporo-parietopetalia and right frontopetalia, n. caudatus and putamen are found to be in an antero-lateral position on the right side.

Fig. 6.

In the cases of right occipitopetalia in conjunction with left frontopetalia and left temporo-parietopetalia (Fig. 6) n. caudatus and putamen

are in an antero-lateral position on the left side. On an especially elaborated brain preparation (Fig. 7) n. ruber, n. niger, and n. dentatus are clearly perceptible to be in an antero-lateral position on the right side i. e. on the side of frontopetalia and temporo-parietopetalia.

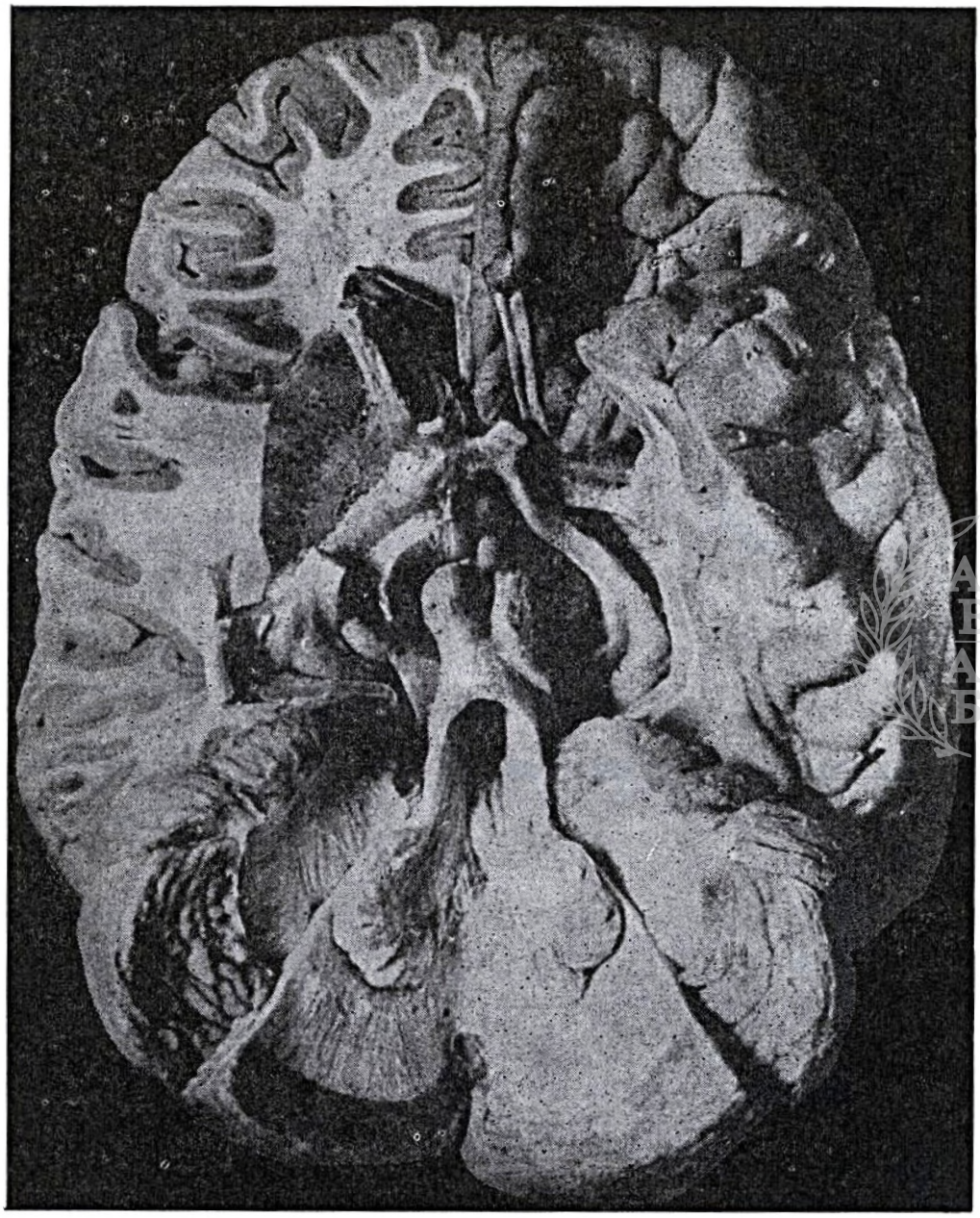

Fig. 7.

The appearance and position of the extrapyramidal nuclei depend on the configuration of the brain and the type of skull. Asymmetry of

the extrapyramidal nuclei is readily apparent if the type of the brain is determined by measurement of oblique diameters of a corresponding skull.

On live individuals the type of skull and that of brain can be determined by measurement of oblique diameters. Owing to the type of brain the appearance and position of extrapyramidal nuclei of investigated individuals are determined.

SUMMARY

On 500 randomized macerated and degreased human skulls the type of skull and type of brain conform to it were determined by measurement of oblique diameters owing to established points. On 250 brains especially preserved anatomical preparations were worked out by careful dissection. On frontal and horizontal brain sections as well as on especially elaborated preparations, the apprearance and position of the extrapyramidal nuclei in symmetrical and asymmetrical brains were investigated. On the side of frontopetalia and temporo-parietopetalia the investigated extrapyramidal nuclei are in an antero-lateral position, whereas those on the side of occipitopetalia are retracted backward. Owing to the type of skull and to the type of brain the appearance and position of the extrapyramidal nuclei of the investigated individual may be determined.

H. HADŽISELIMOVIĆ

IZGLED EKSTRAPIRAMIDALNIH JEZGARA U ODNOSU NA KONFIGURACIJU ČOVJEKOVE LOBANJE

KRATAK SADRŽAJ

Mjerenjem kosih promjera na 500 čovječjih lobanja, uzetih bez izbora, određen je tip lobanje. U 2% ispitivanih slučajeva radilo se o potpuno simetričnim lobanjama. U 42% ispitivanih slučajeva konstatovao sam okcipitalnu simetriju udruženu sa temporo-parietopetalijom desne ili lijeve strane. U 36,8% ispitivanih slučajeva radilo se o okcipitopetaliji sa lijeve strane, koja je bila kombinovana sa desnom temporo-parietopetalijom, a u nekim slučajevima i sa desnom frontopetalijom. U 19,2% ispitivanih slučajeva ustanovio sam desnu okcipitopetaliju udruženu sa lijevom temporo-parietopetalijom, a u nekim slučajevima i sa lijevom frontopetalijom.

Na 250 specijalno konzerviranih i prepariranih mozgova ispitivao sam izgled unutrašnjih moždanih struktura kod simetričnih i asimetričnih mozgova. Mjerenjem kosih promjera odredio sam prvo tip lobanje, a zatim izvadio mozak iz lobanje i odredio njegov tip. Na frontalnim i horizontalnim presjecima ispitivao sam izgled i položaj n. caudatus-a,

putamen-a, globus pallidus-a, n. subthalamicus-a, thalamus opticus-a, substantiae nigrae, n. ruber-a i n. dentatus-a kod simetričnih i asimetričnih mozgova. Na specijalno izrađenim moždanim preparatima proučavao sam izgled i položaj ekstrapiramidnih jezgara. Na strani okcipitopetalije ekstrapiramidne jezgre su povučene prema nazad, a na strani temporoparietopetalije i frontopetalije te su jezgre latero-i anteroponirane. Moguće je na živim osobama, mjerenjem kosih promjera lobanje, odrediti tip lobanje i mozga i prema tome suditi o izgledu i položaju ekstrapiramidnih jezgara i ostalih unutrašnjih moždanih struktura ispitivane osobe.

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DISCUSSION

Schnieden: 1) Is it possible that fixation artefacts could have accounted for some of the results you observed in the brains you examiend? 2) It would appear your results on asymetry might be of help to the stereotaxic surgeon. Have you measured oblique radius of skull at post mortem, tried to place a stereotaxic lesion and then confirmed correctness of lesion placement by checking the brain?

Hadžiselimović: 1) I investigated only the macerated and degreased skulls and preserved brains. I have no experience on the living persons, especially by stereotaxic operations. 2) That is not artefact, all structures are normal. My results are possible ro examine on the living individuals.