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Research Article

RESULTS OF SURGICAL TREATMENT OF EPIDERMOID CYSTS OF THE BRAIN

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ABSTRACT

The work presents the results of surgical treatment of epidermoid cysts of the brain. Currently, various types of surgical techniques for this pathology are being continuously improved, but there are no studies with a high level of evidence base on the significant advantages of one or another surgical treatment tactic.

KEYWORDS

Epidermoid, epidermoid cyst, surgical treatment.

INTRODUCTION

Intracranial epidermoid cysts, resulting from a violation of the neural tube anlage at 3–5 weeks of fetal development, are rare heterotopic, dysontogenetic,

benign formations. According to world data, the incidence of intracranial epidermoid cysts is 0.2-1.8% among all primary brain tumors [2,3]. Epidermoid cysts

do not have a typical localization, occurring both in the medulla and in the base of the skull, being located both intradurally and extradurally. Epidermoids grow slowly and develop mainly in middle-aged and elderly people. Aseptic inflammation often develops around the epidermoid, and when ruptured, the contents (keratin) break through into the subarachnoid space, into the cerebrospinal fluid spaces, causing aseptic meningitis [1].

The only effective treatment for epidermoid cysts is surgical removal. At the same time, the invasive nature of growth and other features of the biological behavior of these tumors determine a rather high risk of cranial nerve dysfunction and the development of aseptic meningitis in the postoperative period. First of all, this is true for epidermoid cysts localized in the pontocerebellar angle and in the middle cranial fossa [4]. The high recurrence rate of epidermoid cysts, which, according to various sources, is 10-24%, leads to the need for repeated operations, which significantly increases the risk of neurological complications. The results of treatment of epidermoid cysts should be

considered not entirely satisfactory due to the high incidence of cranial nerve dysfunction and aseptic meningitis after surgery. The causes of relapses and complications of surgical treatment of epidermoid cysts are not completely clear [5,6].

RESEARCH OBJECTIVE

To improve the results of surgical treatment of epidermoid cysts by determining the optimal surgical tactics.

MATERIALS AND METHODS

The analysis of the results of examination and surgical treatment of 70 patients with epidermoid cysts of the brain, who were treated at the Republican Specialized Scientific and Practical Medical Center for Neurosurgery in the period from 2015 to 2021 inclusive, was carried out. 70 patients with epidermoid cysts were operated on, including 42 men (60.0%), 28 women (40.0%). The age of patients ranged from 18 to 65 years, the average age was 41.5 years (table 1.).

Table 1

Distribution of patients by sex and age

Sex n(%)	Male 42 (60,0%)		Female 28 (40,0%)		Total 70 (100%)
Age	18-40	Over 41 years old	18-40	Over 41 years old	
Amount n(%)	28 (66%)	14 (34%)	20 (71%)	8 (29%)	

According to our observations, the most common reason for treatment of patients with epidermoid cysts of the brain was hypertensive headaches in 23 (32.8%) patients, dizziness and unsteadiness when

walking in 15 (21.4%), hearing loss in 12 (17, 1%) of patients, numbness and facial pain first appeared in 9 (12.8%), epileptic seizures in 6 (8.5%), symptoms of damage to the third nerve, namely, diplopia and



limitation of upward gaze were noted in 4 (5.7 %) of patients. In isolated cases, the manifestation of the disease was represented by chiasmal syndrome, hemifacial spasm and endocrine disorders in the form

of growth retardation. The distribution of patients by primary reasons for treatment is presented in table 2.

Table 2

The reason for the treatment of patients with epidermoid cysts of the brain

Reasons for the treatment of patients	Number of patients
Headaches	23 (32,8%)
Unsteadiness when walking	15 (21,4%)
Hearing loss	12 (17,1%)
Numbness and facial pain	9 (12,8%)
Epileptic seizures	6 (8,5%)
Diplopia and upward gaze limitation	4 (5,7%)
Total	70 (100%)

RESULTS AND ITS DISCUSSION

By localization, epidermoid cysts of the brain were distributed as follows: subtentorial localization was noted in 44 (62.8%) patients, supratentorial localization - in 23 (32.8%) patients. In 3 (4.2%) patients, the epidermoid cyst spread supra-subtentorially. With subtentorial localization in 31 (70.5%) patients, the epidermoid cyst was located in the ponto-cerebellar angle, in 9 (20.5%) patients in the region of the IV ventricle and in 4 (9.0%) patients in the region of the cerebellar vermis. With supratentorial localization - in

13 (56.5%) patients, the epidermoid cyst was located on the basis of the middle cranial fossa, in 10 (43.5%) patients on the basis of the anterior cranial fossa. Supra - subtentorial localization was observed in 3 patients, in this case, the tumor originated in the area of the cerebellum, then spreading to the base of the middle cranial fossa and posterior cranial fossa. During surgical intervention in patients with epidermoid cysts of the brain, total removal of the epidermoid was achieved in 55 (78%) patients, subtotal removal in 15 (22%) patients (table 3).



Table 3

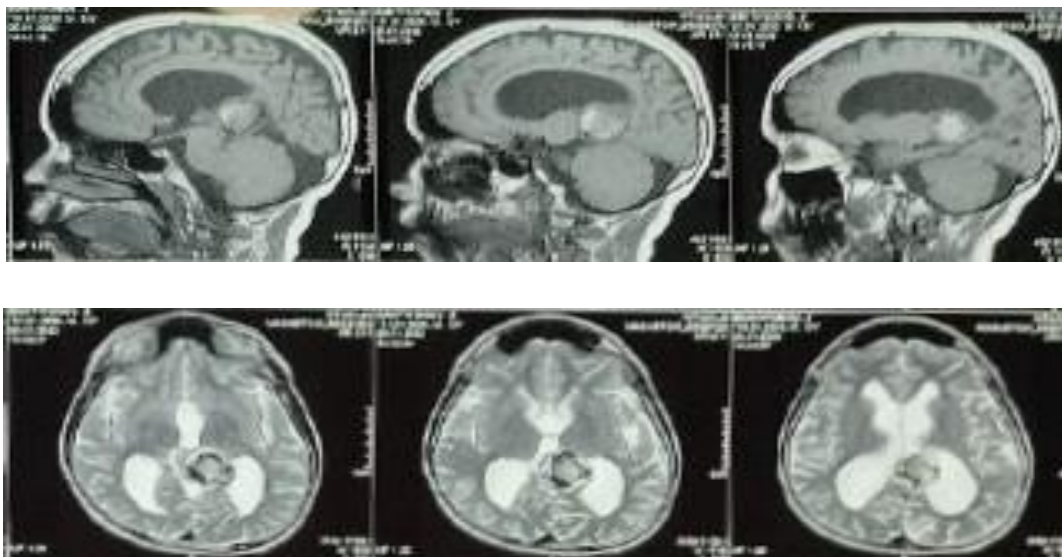
Radicality removal	Localization of the epidermoid					
	CPA	IV venticle	Cerebellarwo rm	MCF	ACF	Supra - subtentorial MCF + ACF
Total removal	25	7	3	10	9	1
Subtotal removal	6	2	1	3	1	2
Total amount	31	9	4	13	10	3

Subtotal removal was due to the fact that the capsule of the epidermoid cyst was tightly fused with the surrounding nerve, vascular or brain structures. Intra and postoperative complications were detected in 11 (15.7%) patients. Complications were expressed in the formation of a hematoma in the tumor bed, the development of aseptic meningitis, symptoms of irritation of the brain stem, as well as the development of postoperative ischemia of the brain area. A lethal outcome was observed in 1 case and was due to the localization of the tumor, the huge size of the tumor, subtotal removal and the development of postoperative complications.

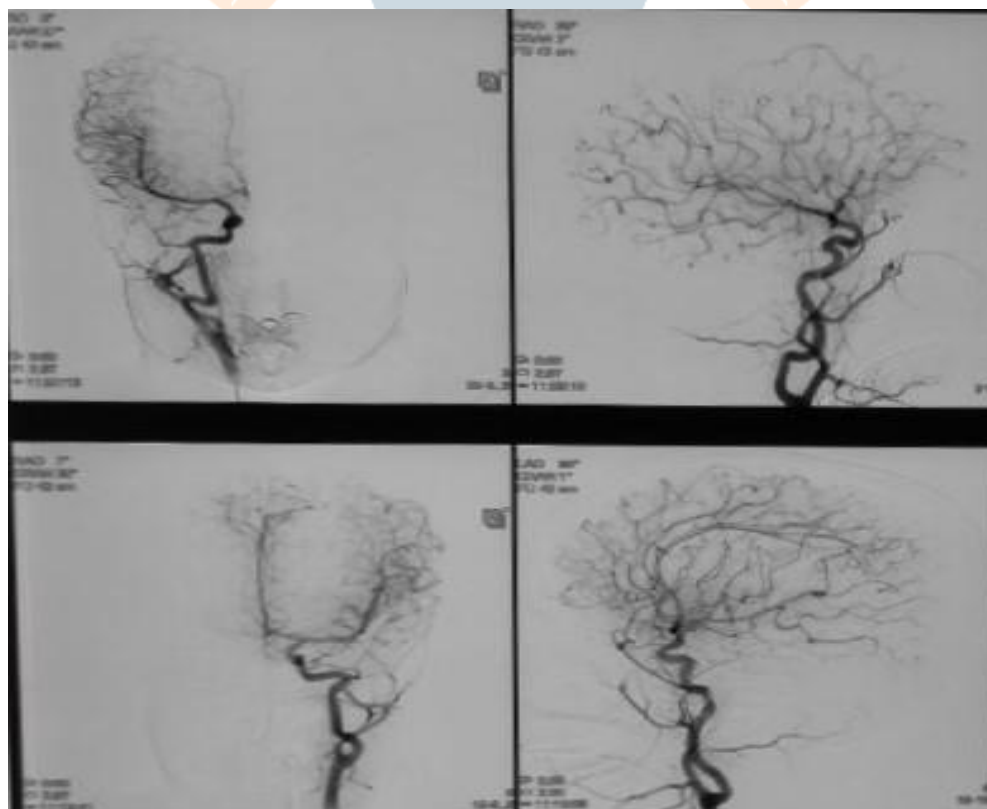
Clinical example.

Patient B., aged 18, was admitted to the Department of Vascular Neurosurgery of the RSSPMCN with complaints of paroxysmal headaches. The available MRI images of the brain revealed the formation of the

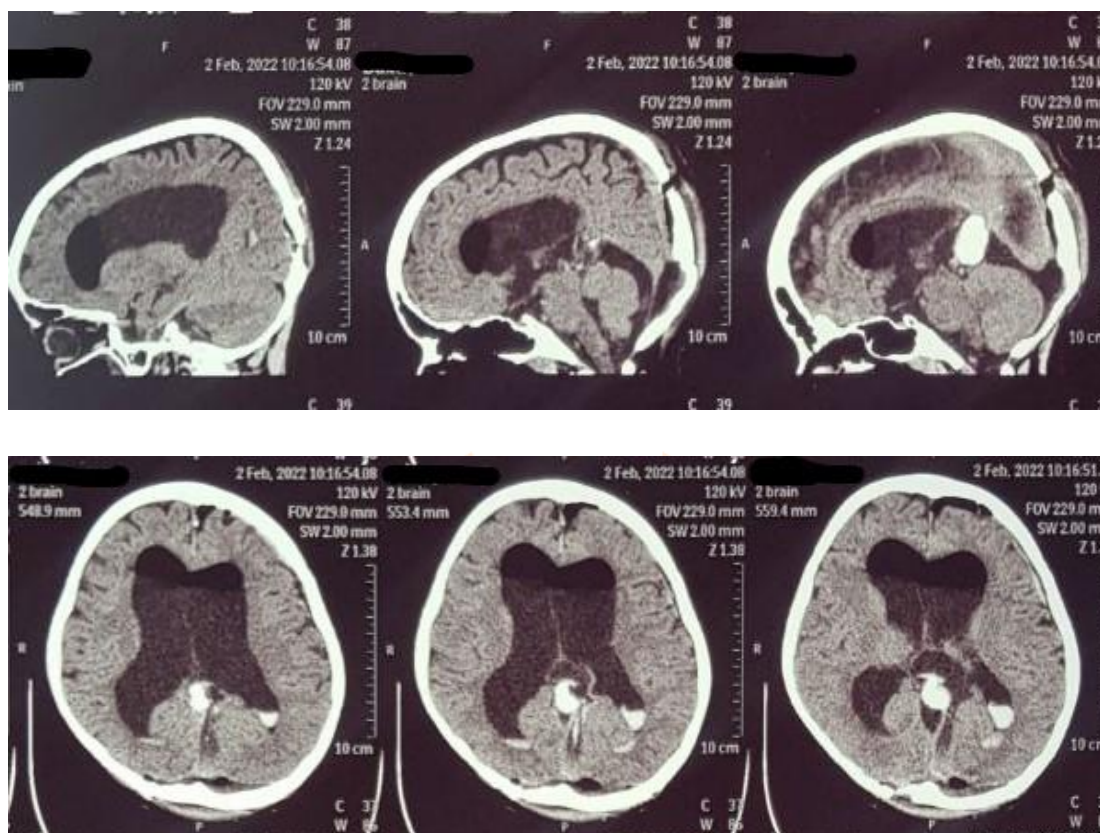
pineal region (Picture 1). The formation caused impaired CSF flow, hydrocephalic expansion of the ventricles with periventricular edema. A preliminary diagnosis was made: Cavernoma of the pineal region. The patient was dismantled at a medical conference, where a diagnosis was made: Arteriovenous malformation of the vein of Galen. To clarify the diagnosis, the patient underwent selective cerebral angiography, which showed no vascular pathology (Picture 2). The patient underwent the operation “Removal of an extracerebral neoplasm of the pineal region by interhemispheric access”, in which an epidermoid cyst with a dense capsule was found, the capsule was tightly soldered to the falx and the posterior wall of the 3rd ventricle. After opening the capsule and internal decompression, the tumor was removed totally. Part of the capsule tightly soldered to the falx was left. After removal of the tumor, brain relapse was noted, and in order to restore the CSF flow, it was decided to open the wall of the 3rd ventricle (Picture 3). The patient did not experience postoperative neurological deficit.



Pic 1. MRI of the brain showing the formation of the pineal region.



Pic. 2. Selective cerebral angiography - no vascular pathology was detected during the investigation.



Pic 3. MSCT - of the brain - on postoperative images there is a part of the capsule tightly soldered to the falx with traces of hemorrhage in the postoperative tumor place.

CONCLUSIONS

1. The choice of tactics for surgical treatment of cerebral epidermoids is determined by their topographic and anatomical localization and the nature of their growth.
2. The main task in the surgical removal of the epidermoid of the brain is the total removal, which is not always possible due to size of he tumor, and its fusion with the surrounding

brain, nervous and vascular structures of the brain.

3. Improving the quality of life and preventing the development of relapses directly depends on the radical removal of the tumor and the development of intra and postoperative complications.

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