



MICROSURGICAL TREATMENT OF INTRA-CEREBRAL HYPERTENSIVE PUTAMINAL HEMATOMAS USING TRANS SYLVIAN APPROACH

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ABSTRACT

OBJECTIVE: The treatment of putamenal hypertensive hematomas is a current problem in everyday neurosurgical practice. They are about 45% of all hypertensive hematomas. We aimed at routinely introducing in the everyday clinical practices the trans-sylvian microsurgical approach to the surgical treatment of this severe pathology. **MATERIALS AND METHODS:** We present 63 cases of hypertensive putamenal hematomas treated surgically by trans-sylvian microsurgical approach at the Neurosurgical Clinic of Stara Zagora University Hospital. 43 of them are men and 20 are women, aged 38 to 80. **RESULTS:** The surgical interventions for 53 of the patients through trans-sylvian microsurgical approach went without any complications. In the early post-surgical period, all patients experienced a regress of the neurological deficit and improvement of the overall condition. In 10 patients the condition was aggravated by the concomitant somatic diseases which led to lethal end. **CONCLUSION:** The trans-sylvian microsurgical approach ensures less traumatic surgical interventions, preserving as much as possible the physiological and anatomical structures of the brain. In this approach injury of temporal cortex is avoided which is important to the dominant hemisphere. The surgical intervention creates the least amount of discomfort for the patient and the recovery post-surgical period is fast and with minimum complications.

Key words: trans-sylvian approach, hypertensive hematoma – surgical treatment

INTRODUCTION:

The treatment of putamenal hypertensive hematomas is a current problem in everyday neurosurgical practice. They are about 45% of all hypertensive hematomas (1) and are most devastating type of stroke and a leading cause of disability and mortality in the United States and the rest of the world. Results from multicenter prospective randomized controlled trials have shown that early hemostasis to prevent hematoma growth, removal of clot by surgical or minimally invasive interventions and adequate blood pressure control for the

optimization of cerebral perfusion pressure may constitute the most important therapeutic goals to ameliorate secondary neurological damage decrease mortality, and improve functional outcomes (2). An operation performed as soon as possible after intracerebral haematoma onset may be optimal for preserving the nervous system function (3). Indicative for surgical treatment are the hematomas with acute or slowly progressing worsening, accompanied by expressed dislocation of the midbrain structures. The transsylvian transinsular approach was first described by Suzuki and Sato 1976. This technique involves classic pterional craniotomy and sylvian dissection with surgical microscope (4). We aimed at routinely introducing in the everyday clinical practices

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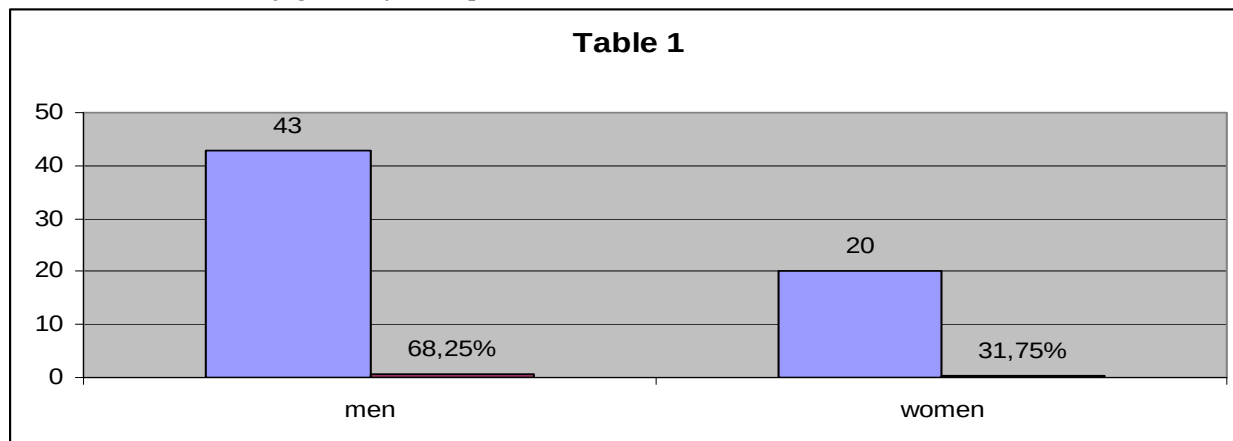
the trans-sylvan microsurgical approach to the surgical treatment of this severe pathology.

MATERIALS AND METHOD:

We present 63 cases of hypertensive putaminal hematomas treated surgically by trans-sylvan microsurgical approach at the Neurosurgical Clinic of Stara Zagora University Hospital

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between 1999 and 2011 were analyzed retrospectively. 43 of them are men and 20 are women (**table 1**), aged 38 to 80 (avarage age 57). For the surgical intervention we used Carl Zeiss surgical microscope, AESCULAP micro-set and ERBE 350 bipolar coagulator.

Table 1. Distribution of operated patients with intracerebral putaminal hypertensive haematoma by gender for the period 1999 - 2011



Following frontotemporal craniotomy for which the projection of the Sylvian fissure was in the center of the surgical area (**fig. 1**), we dissected under optical enhancement the Sylvian fissure laterally from the Sylvian vein in the external chamber of the Sylvian tank (**fig. 2**), while protecting as much as possible the venous inflows and the branches of the midbrain artery. The length of the dissection was 3-4 cm for better identification of the

insular cortex. Using a ventricular needle we verified the hematoma (**fig. 3**) and following incision of the insular cortex we penetrated in its cavity and evacuated by aspiration and lavage with physiological serum (**fig. 4**). Following thorough hemostasis (**fig. 5**), we restored the cerebral membranes, performed epidural pipe drainage and restoration of the bones, muscles and skin.

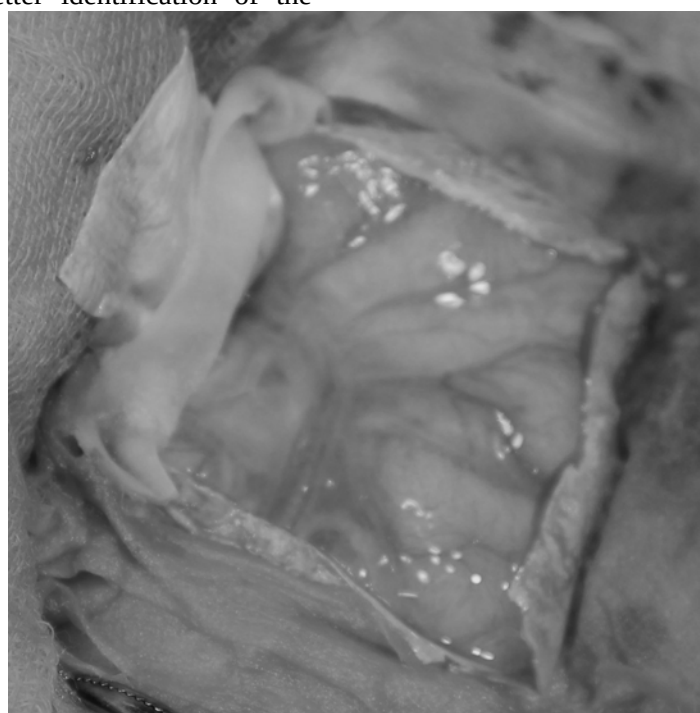


Fig. 1. The exposure of Sylvian fissure after pterional craniotomy.

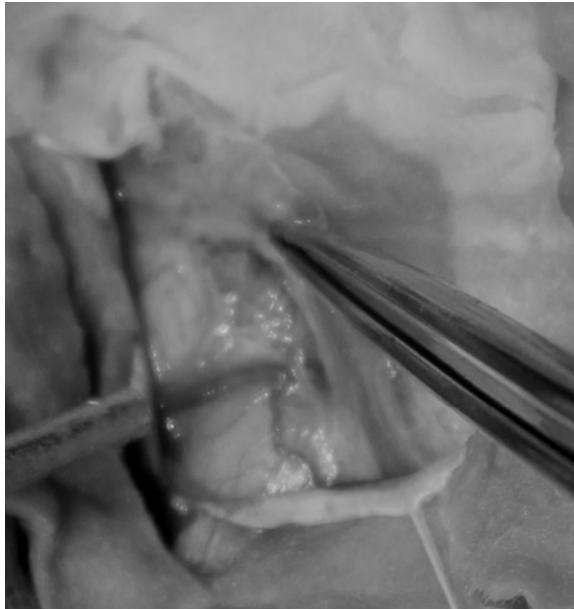


Fig. 2. Dissection of the Sylvian fissure.



Fig. 3. Verification of the hematoma.

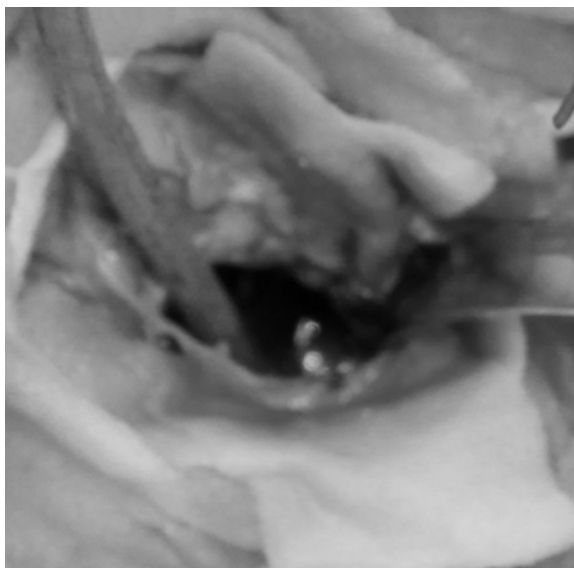


Fig. 4. Evacuation of the hematoma using aspiration and lavage with physiological serum.



Fig. 5. Sylvian fissure after evacuation of the hematoma.

RESULTS

The surgical interventions for 53 of the patients (84,13%) through trans-sylvian microsurgical approach went without any complications. In the early post-surgical period, all patients experienced a regress of the neurological deficit and improvement of the overall condition (**fig. 6 and fig. 7**). In 10 patients (15,87%) the condition was aggravated by the concomitant somatic diseases which led to lethal end (**table 2**).

DISCUSSION

The results from this study shows that surgical intervention performed as soon as possible after intracerebral haematoma onset leads to

optimal preservation of brain functions and improvement of the overall condition in the early postoperative period. The surgical intervention through trans-sylvian microsurgical approach ensures less traumatic surgical interventions and creates the least amount of discomfort for the patient. This operative technique preserves as much as possible the physiological and anatomical structures of the brain and the recovery post-surgical period is fast and with minimum complications. Our results from the surgical treatment of 63 patients through trans-sulcal microsurgical approach corresponds with the results of using transsulcal approach to intracerebral lesions by many authors. T.

Mirsen says that the key to acute treatment of this condition will be early intervention, with implementation of blood pressure control, administration of clotting factors (5). Computed tomography imaging is an important examination method to evaluate the clinical outcome (6). N. Shimamura after surgery of 65 consecutive patients with supratentorial intracerebral haematoma says

VALKANOV ST., *et al.* that decompressive craniectomy is not necessary for rescue if the hematoma can be removed completely (7). Kanno T. after a comparison of the long-term outcome after surgical and nonsurgical treatment of hypertensive putaminal hemorrhage, reported that experimental studies have shown that hematoma evacuation improves neuronal functions (8).

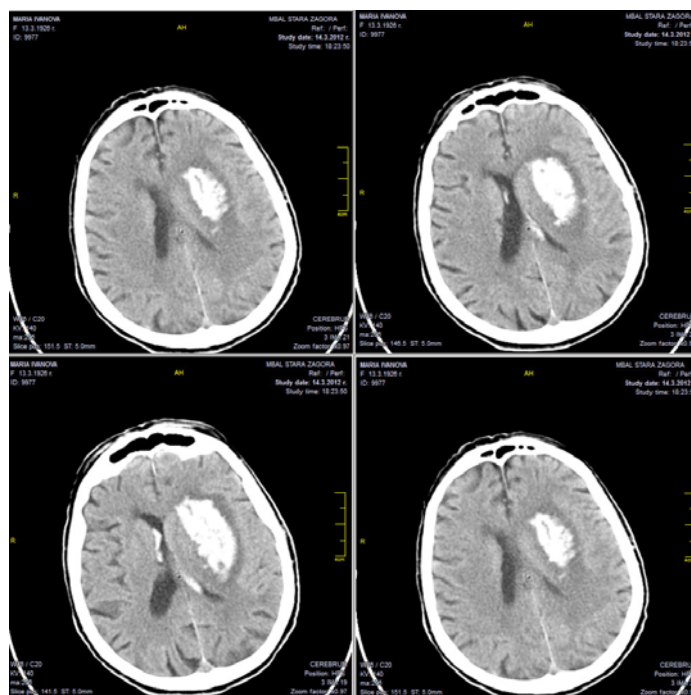


Fig. 6. Pre-operative CT

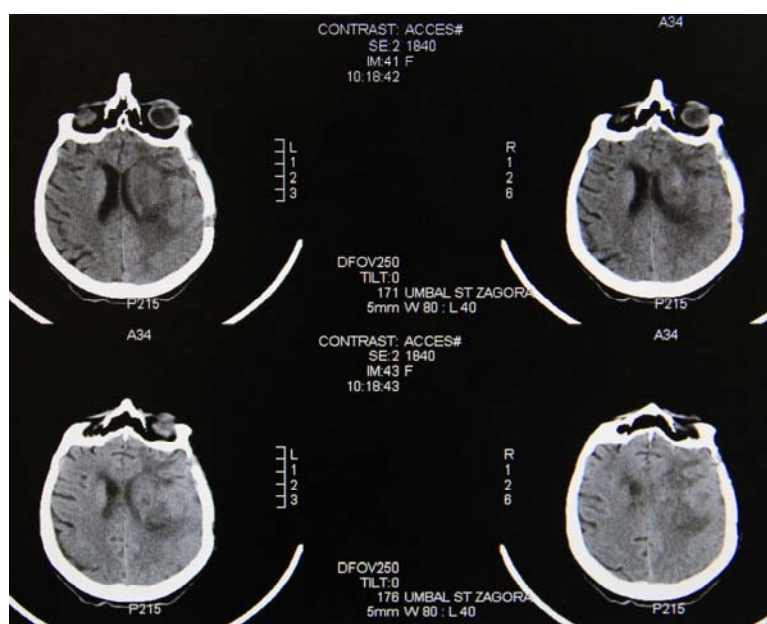
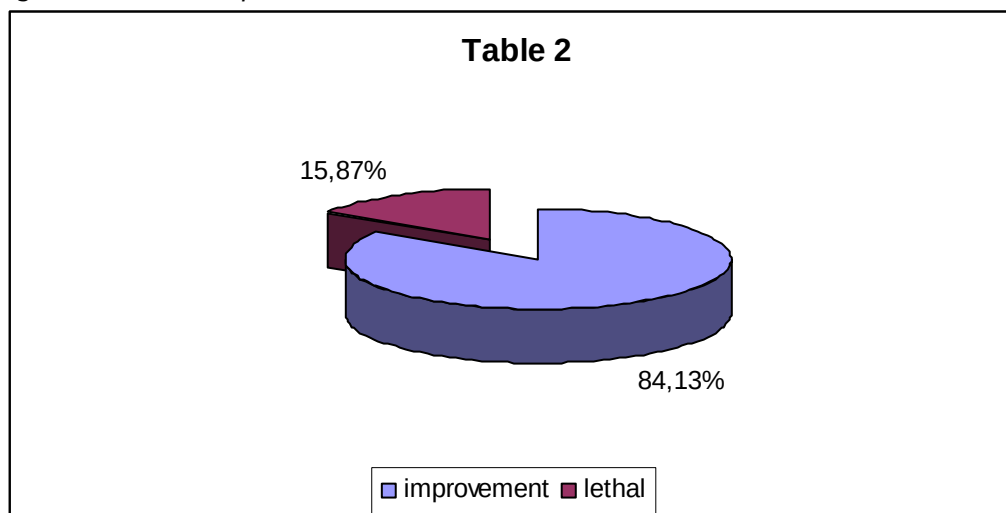


Fig. 7. Post-operative CT

Table 2. Distribution of operated patients with intracerebral putaminal hypertensive haematoma depending on the outcome of treatment.



CONCLUSIONS

1. The trans-sylvian microsurgical approach ensures less traumatic surgical interventions.
2. Preserves as much as possible the physiological and anatomical structures of the cerebrum.
3. In this approach injury of temporal cortex is avoided which is important to the dominant hemisphere.
4. The surgical intervention creates the least amount of discomfort for the patient.
5. The recovery post-surgical period is fast and with minimum complications.

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