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MINIMALLY INVASIVE SURGICAL TREATMENT OF ACUTE EPIDURAL HEMATOMA

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Resume. This article is about minimally invasive surgical treatment of acute epidural hematoma. Particular attention is paid to the technique of surgical treatment, exactly by the endoscope-assisted evacuation. Comparative analysis of different methods of treatment of epidural hematomas was performed. The article provides an analysis of 21 case histories of the patients with epidural hematomas.

Keywords: epidural hematoma, craniotomy, minimally invasive surgery.

Introduction. Acute epidural hematoma is one of the most common secondary brain neurosurgical skull injuries, accounting for 30% of intracranial hematomas. Bleeding is mainly due to ruptured meningeal middle artery. Epidural hematomas often lead to neurological disorders, and according to different authors, from 5% to 30% of all cases of epidural hemorrhages are fatal [1]. But if simple epidural hematomas are treated immediately, a good prognosis is often achieved.

Until now the main methods of treatment of epidural hematomas are osteoplastic trepanation with removal of the bone flap and resection craniotomy. Craniotomy has negative psychological effects on patients such as fear, anxiety, and depression. Most of the patients lacked confidence to enter into marital relationships or perform jobs and social activities due to perceived disability following craniotomy. But there are other, minimally invasive methods of treatment. Application of minimally invasive surgery attracts increasing attention from neurosurgeons [2]. Although minimally invasive surgical treatment of acute epidural hematoma attracts increasing attention, no generalized indications for the surgery have been adopted.

The endoscopic evacuation of intracerebral hematoma is performed through a small skin incision, and a keyhole 2 cm in diameter is made in the skull. The hematoma can be directly visualized by the endoscope with excellent illumination. After hematoma evacuation, the bone flap of the keyhole is repositioned, and the skin incision is closed. Endoscopic evacuation of intracerebral hematoma provides effective and minimally invasive surgery for intracerebral hematomas.

Aim: to analyze methods of surgical treatment of acute epidural hematoma with various hematoma volumes.

Objective:

1. To analyze the results of CT- scans of the patients with epidural hematomas treated in «Minsk City Emergency Hospital».

2. To find out the main methods of epidural hematomas treatment employed in «Minsk City Emergency Hospital».

3. To analyze the duration of the operation and hospitalization time for patient with epidural hematoma depending on the treatment methods.

4. To analyze the obtained data.

Materials and methods. The study analyzed 21 case histories of the patients with acute epidural hematoma for the period 2022-2023 was carried out in «Minsk City Emergency Hospital». A retrospective analysis of case histories and CT - scan data was performed. Statistical processing of the results was performed using the table editor "Microsoft Excel 2017" and "Statistica" 10.0.

Results and their discussion. Among adult (n=21) the average of the patients $56 \pm 2,4$ years, including women 4 (19%), men 17 (81%). Craniotomy was performed in 85,7% of cases (hematoma volume $52 \pm 2,8$ ml), endoscopic removal of the hematoma – 14,3% of cases (hematoma volume $29 \pm 1,7$ ml) (Fig. 1). For endoscopic operation a manual skull driller was used to drill through the scalp and skull, and hematoma was aspirated as much as possible using a brain puncture needle.

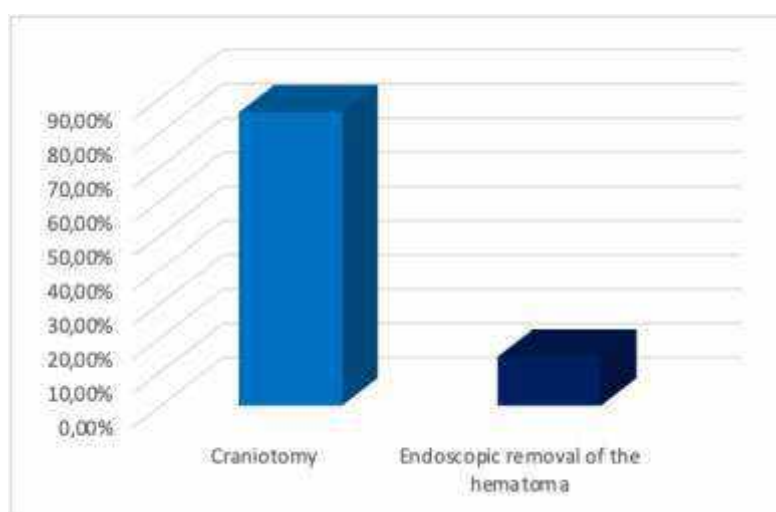


Fig. 1 – Methods of epidural hematomas treatment in «Minsk City Emergency Hospital»

Surgery time was: 90 - 100 minutes (for craniotomy), 25 – 40 minutes (for endoscopic removal of the hematoma) (Fig. 2). No surgical complications occurred, such as increased hematoma volume or functional impair during endoscopic removal of the hematoma.

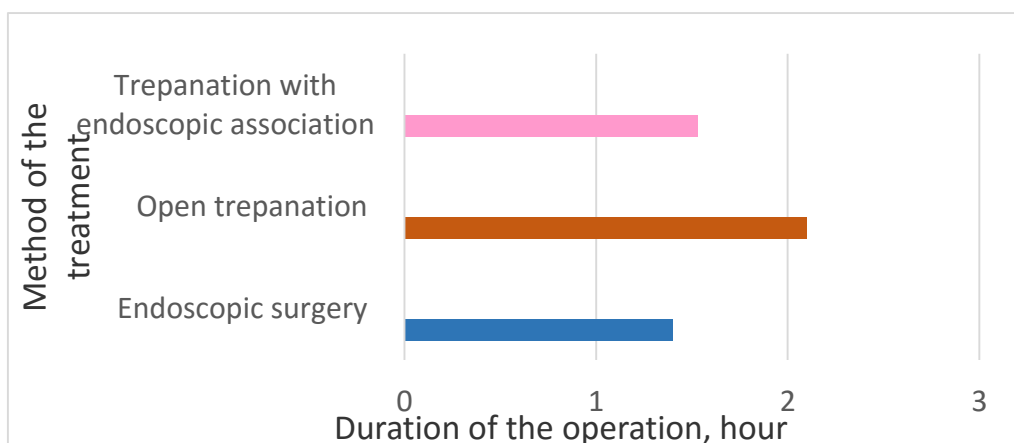


Fig. 2 – Duration of different methods of epidural hematomas treatment

The average length of hospital stay was 13 bed-days (Fig. 3). There was no significant difference in the length of hospital stay after different methods of epidural hematoma treatment. Discrepancies were related to individual cases of patients with severe head trauma or concomitant pathology.

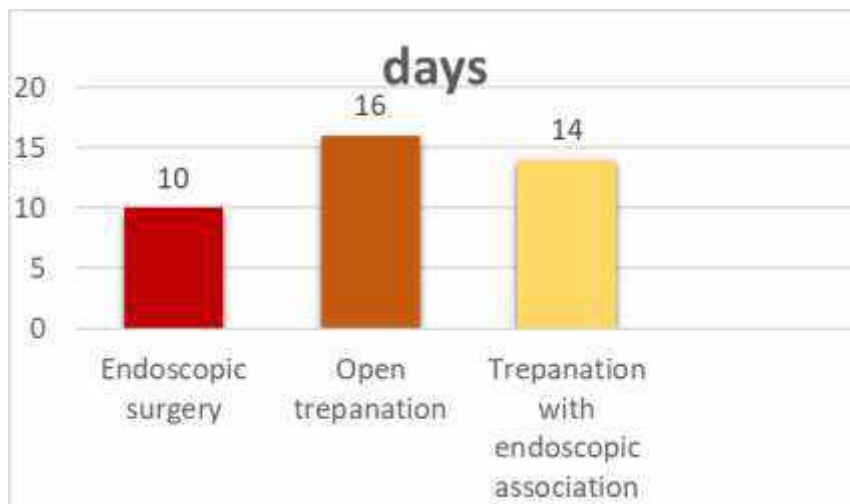


Fig. 3 – Time of arrival in the hospital

We also analyzed in which age groups a certain method of epidural hematoma treatment was more frequently used. It was found that conservative treatment was used in age-matched patients with small hematomas.

Conclusions:

1. The most common method for treatment of epidural hematomas is craniotomy (85,7% of cases). Endoscopic removal of the hematoma used in 14,3% of cases.
2. The indications for minimally invasive surgery epidural hematoma volumes ranging between 20 ml and 40 ml.
3. Minimal invasive surgery has many advantages such as small incisions and quicker operative time. It has good curative effect on treatment of the acute epidural hematoma with a small amount of bleeding (less than 40 ml) and can avoid craniotomy.

Literature

1. Conservative vs. Surgical Management of Post-Traumatic Epidural Hematoma: A Case and Review of Literature / R. Maugeri, D. G. Anderson, F. Graziano et al. // American Journal of Case Reports. – 2015. – Vol. 16. – P. 811-817.
2. Wang, W. M. Minimally Invasive Surgical Treatment of Acute Epidural Hematoma: Case Series [Electronic resurse] / W. Wang // BioMed Research International. – Mode of access: <http://dx.doi.org/10.1155/2016/6507350>. (access date: 02.06.23).