Hemodynamic swelling of the brain

Hemodynamic swelling of the brain (swelling, congestion, turgescence, engorgement, cerebral hyperemia) is a phenomenon accompanying brain injuries (it is not edema - nomenclature, the term **brain swelling** is superior to the terms "edema" and "swelling"). Swelling usually prevents the development of brain edema .

Pathogenesis

The cause is a **loss of autoregulatory ability** of cerebral vessels. Autoregulation ensures a constant flow of blood through the brain, independent of fluctuations in blood pressure. Loss of autoregulation leads to dilation of the vascular bed, especially in its capillary and postcapillary part. This process is called **vasoparalysis** . Within minutes, there is a sharp rise in intracranial pressure (ICP) due to increased vascular load, and cerebral perfusion in the oppressed tissue worsens, leading to the development of cytotoxic edema . The progression of intracranial hypertension can lead to life-threatening brain herniation .

Forms

Swelling can be divided into several forms according to the scope:

1. **Generalized swelling** affects the brain to the full extent. It is often accompanied by diffuse axonal damage .
2. **Hemispheric swelling** is found in acute subdural hemorrhage on the lesion side. Significantly worsens the prognosis. It typically manifests itself after the evacuation of bleeding, when the brain begins to increase in volume, so to speak, in front of the eyes and is pushed into the trepanation hole (historically referred to as malignant brain edema). To prevent this surgical complication, we always operate when we suspect swelling from a broad approach.
3. **Local swelling** always occurs in the initial phase around the contusion bearing. In time, it turns into classic edema.

Hemodynamic swelling may occur over time

- early (immediately after the accident),
- late (with a latency of several days).

Diagnostics

It is based on the use of imaging methods, especially CT . Intracranial hypertension is evident and brain tissue density is **increased** . In generalized involvement, extinct gyrification may be seen on the convexity of the hemispheres.

Terapie

⚠ The only effective proven therapy is the use of artificial hyperventilation. Cerebral vessels respond to hypocapnia vasoconstrictively.

Links

- ws:Hemodynamické zduření mozku

Related articles

- Brain edema

References

- ZEMAN, Miroslav, et al. *Speciální chirurgie.* 2. edition. Praha : Galén, 2004. 575 pp. ISBN 80-7262-260-9.