Brainstem cavernous malformation surgery

Surgery of brainstem cavernomas still poses a challenge due to the high risk of neurological damage and respectable morbidity.

Once considered inoperable lesions in inviolable territory, brainstem cavernous malformations (BSCM) are now surgically curable with acceptable operative morbidity. Recommending surgery is a difficult decision that would be facilitated by a grading system designed specifically for BSCMs that predicted surgical outcomes.

The use of retractors is to be avoided; cottonoids and exploitation of hematoma cavity may be used to gain access. Brainstem CMs may be extremely adherent to brain parenchyma76 unlike supratentorial CMs.

Bipolar cautery: use on low power with constant irrigation to reduce thermal injury. Unlike supratentorial CMs with seizures (where you want to remove adjacent hemosiderin-stained brain), just remove the CM itself.

Indications

It is recommended in symptomatic patients, in whom the lesion is accessible for surgery typically reserved for lesions that reach pial or ependymal surfaces. [1].

Positive findings on DTT such as fiber tract deviation, deformation, disruption or interruption should be taken cautiously before drawing conclusions of clinically relevant damage of white matter tracts [2].

Timing

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Approaches

Brainstem cavernous malformation approach

Intraoperative monitoring

Intraoperative monitoring is used to avoid impending damage to these highly eloquent tracts. However, data on neurophysiological monitoring during resection of brainstem cavernomas are lacking.

In continuous MEP and SSEP monitoring during brainstem cavernoma microsurgery, high rates of false-positive and -negative results are encountered, resulting in low positive and relatively high

negative predictive values. Careful interpretation of the intraoperative monitoring results is essential in order to avoid potentially unjustified termination of brainstem cavernoma resection [3].

Somatosensory evoked potential should be used in all patients in order to avoid nuclear and long tract damage [4].

References

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