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VERTEBRAL BALLOON TEST OCCLUSION AND THERAPEUTIC SACRIFICE OF VERTEBRAL ARTERIES DURING CERVICAL SPONDYLECTOMIES

Introduction

Treatment of certain cervical spine tumors may involve therapeutic vertebral artery sacrifice, which requires preoperative evaluation of safe feasibility of permanent vertebral artery occlusion. There are not any widely accepted guidelines for vertebral artery occlusion test in contrast to the internal carotid occlusion test.

Methods

We present retrospective study of vertebral artery angiographic balloon test occlusion (BTO) and therapeutic sacrifice of the vertebral artery in the group of patients with primary and secondary cervical spine tumors indicated for single or multilevel radical spondylectomy. An awake angiographic BTO was routinely combined with hypotensive challenge and transcranial Doppler evaluation of cerebrovascular response to breath holding test.

Results

We performed a vertebral artery BTO in 15 patients with cervical spine tumors between 2007 and 2014 without any clinical or radiographical complications. All tested patients, except one who refused surgery, underwent subsequently single or multilevel spondylectomy with sacrificing one or both vertebral arteries. Permanent vertebral artery occlusion was done during tumor resection with correlation of intraoperative motor evoked potentials response. There were no clinical or radiological (MR DW) signs of vertebrobasilar ischemia after selected vertebral artery occlusion in the whole group.

Discussion

BTO decreases the risk of post-operative ischemic stroke. Stroke after artery occlusion can occur by two mechanism: hemodynamic compromise (predictable by BTO), or thromboembolization after vessel ligation. Since clinical monitoring alone has a low sensitivity, different complementary techniques of cerebral circulation have been used to increase prediction accuracy. Among these, transcranial Doppler stands out as a non-invasive bedside real time monitoring of cerebral hemodynamics that eliminates the needs of patient's transport to another site with catheters in place for cerebral blood flow investigation. The use of hypotensive challenge increased the number of patients identified with limited cerebrovascular reserve.

Conclusion

Angiographic balloon test occlusion can be performed at a risk equal to convention neuroangiography together with endovascular tumor embolization during a single session and with correct prediction of hemodynamic outcome after vertebral artery sacrifice.