Mini-Pterional Craniotomy

The pterional craniotomy (PT) is well established for microsurgical clipping of most anterior circulation aneurysms. The incision and temporalis muscle dissection impacts postoperative recovery and cosmetic outcomes.

The minipterional (MPT) craniotomy offers similar microsurgical corridors, with a substantially shorter incision, less muscle dissection, and a smaller craniotomy [1].

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Minipterional craniotomy provides clinical results similar to those of the PT technique. Moreover, it provides better cosmetic results. It can be used safely and effectively to surgically treat aneurysms of the anterior circulation instead of the PT approach [2].

Allows for use of a direct transsylvian approach, and exposes the target in a wide working angle within a short distance. Despite some limitations in exposure, supraorbital craniotomy is suitable for a direct subfrontal approach, and provides a more anteromedial and basal view. Middle cerebral artery aneurysm and posteriorly directing internal carotid artery aneurysm can be good candidates for minipterional craniotomy [3].

Case series

2017

The Department of Neurosurgery, Cairo University, Egypt in a retrospective review of 57 cases involving anterior circulation aneurysms both ruptured aneurysm and unruptured aneurysms treated with the MPT. They analyzed the clinical and patient demographic data, aneurysm characteristics, surgical outcomes, and complications in these individuals.

Between July 2008 and March 2014, of the 57 patients reviewed: 45 had middle cerebral artery aneurysm (MCA), 6 had internal carotid artery terminus, and 7 had posterior communicating artery aneurysms. 20 of the 57 patients presented with a ruptured aneurysm. The average aneurysm size was 5.8 mm. The length of hospitalization for unruptured aneurysm cases ranged between 3 and 5 days. The average follow-up for all cases was 21.5 months. Successful clipping of the aneurysms was obtained in all patients. None of the cases required additional skin incisions or craniotomy extensions. The overall surgical outcomes were favorable. There was no postoperative facial nerve damage, temporalis muscle wasting, or symptoms of paresthesias around the incision line. Two patients developed a postoperative stroke manifested as symptoms of unilateral arm and facial weakness, receptive aphasia, and dysarthria.

The MPT provides a reliable and less invasive alternative to the standard pterional craniotomy. Furthermore, ruptured and unruptured anterior circulation aneurysms can safely and effectively be treated with limited bone removal which provides better cosmetic outcomes and excellent postoperative temporalis muscle function [4].

2014

From January 2009 to July 2013, 82 unruptured aneurysms were treated in 72 patients, with 74 MPT craniotomies. Seven patients had multiple aneurysms treated with a single MPT craniotomy. The average patient age was 56 years (range: 24-87). Aneurysms were located along the middle cerebral artery (n = 36), posterior communicating (n = 22), paraophthalmic (n = 22), choroidal (n = 1), and dorsal ICA segments (n = 1). The MPT craniotomy utilized an incision just posterior to the hairline and a single myocutaneous flap.

The average aneurysm size was 5.45 mm (range: 1-14). There were no instances of compromised operative corridors requiring craniotomy extension. Three significant early postoperative complications included epidural and subdural hematomas requiring evacuation, and a middle cerebral artery infarction. Average length of hospitalization was 3.96 days (range: 2-20). Two patients required reoperation for wound infections. Average follow-up was 421 days (range: 5-1618). Minimal to no temporalis muscle wasting was noted in 96% of patients.

The MPT craniotomy is a worthwhile alternative to the standard pterional craniotomy. There were no instances of suboptimal operative corridors and clip applications when the MPT craniotomy was utilized in the treatment of unruptured middle cerebral artery and supraclinoid internal carotid artery aneurysms proximal to the terminal internal carotid artery bifurcation [5].

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