Frontotemporal contour deformity

Pterional craniotomy is a useful approach for the treatment of a variety of intracranial pathologies. However, it can result in temporal hollowing, which causes significant craniomaxillofacial asymmetry and esthetic deformity. The present study was performed to determine the postoperative outcomes of patients following frontotemporal depression reconstruction using a high-density porous polyethylene (HDPE) implant (Medpor®; Stryker, Kalamazoo, MI) after pterional craniotomy.

The patients had undergone reconstruction of frontotemporal depression using Medpor® implants after pterional craniotomy at our medical institution during the period from February 2010 to March 2014. We evaluated the thickness and volume of both the temporalis muscle and Medpor® implant through a retrospective review of the medical records and computed tomography (CT) scans of 92 patients.

The mean temporalis muscle thickness ratio (muscle thickness of the affected side/nonaffected side) was 0.61 ± 0.16. The mean reconstructed temporalis muscle thickness ratio (muscle and Medpor® implant thickness of affected side/muscle thickness of nonaffected side) was 1.15 ± 0.02. The mean temporalis muscle volume ratio (muscle volume of affected side/nonaffected side) was 0.67 ± 0.02. The mean reconstructed temporalis muscle volume ratio (muscle and Medpor® implant volume of affected side/muscle volume of nonaffected side) was 1.18 ± 0.02.

Temporalis muscle thickness and volume were significantly decreased on the affected side after pterional craniotomy. Reconstruction of frontotemporal lesions using Medpor® implants after the pterional approach improved temporal hollowing without additional complications [1)].

Fat grafting has been described as an option to repair frontotemporal contour deformities (volumetric deficiency of bone and/or soft tissues) after neurosurgical/craniofacial surgical interventions. However, technical surgical descriptions have varied, with reports describing the bolus fat injection or the classical multilayer injection, but with no detailed descriptions concerning how and where the fat should be grafted. The purpose of a study was to assess the frontotemporal symmetry outcomes after a single fat grafting procedure for postoperative frontotemporal contour deformity reconstructions using the anatomical fat grafting approach.

A prospective analysis was conducted of consecutive patients (n=106) who underwent anatomical fat grafting (Coleman's structural fat grafting technique using anatomical facial subunit and fat compartment principles) to reconstruct frontotemporal contour deformities after neurosurgical/craniofacial surgical interventions. A subjective assessment by a panel of external surgical professionals and laypersons was obtained to grade the frontotemporal symmetry. Objective ultrasound symmetry assessment was blindly performed preoperatively and at 3- and 12-months follow-up.

There were significant (all $p<0.05$) postoperative subjective and objective frontotemporal symmetry enhancements (preoperative < postoperative) after anatomical fat grafting, with no differences (all $p>0.05$) between the 3 and 12-month postoperative comparisons. Thirty-seven percent of patients required an additional fat grafting session for residual asymmetry after 12 months of follow-up.

Patients with frontotemporal contour deformities presented improved subjective and objective frontotemporal symmetry after an anatomical fat grafting session [2)].

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2)
Denadai R, Raposo-Amaral CA, Buzzo CL, Ghizoni E, Cendes F, Raposo-Amaral CE. Anatomical Fat Grafting for Reconstruction of Frontotemporal Contour Deformities after Neurosurgical and Craniofacial Surgical Interventions: A Symmetry Outcome Study. World Neurosurg. 2019 Apr 10. pii: S1878-8750(19)31036-8. doi: 10.1016/j.wneu.2019.04.044. [Epub ahead of print] PubMed PMID: 30980984.