Temporal muscle thickness

Temporal muscle thickness refers to the measurement of the thickness of the temporal muscle on routine brain MRIs or CT scans.

It reflects skeletal muscle mass, serving as a surrogate for sarcopenia (muscle wasting), which is often associated with cancer-related cachexia.

Temporal muscle thickness can vary among individuals based on factors such as age, gender, overall health, and level of physical activity.

Measuring temporal muscle thickness can be done through imaging techniques like ultrasound or magnetic resonance imaging (MRI). This measurement might be of interest in various medical contexts, such as assessing muscle wasting (atrophy), monitoring muscle growth or degeneration, or diagnosing conditions affecting the temporalis muscle or surrounding structures.

In neurosurgery

- Temporal muscle thickness as a preoperative predictor of motor aphasia in Moyamoya disease
- Predictors of temporalis muscle atrophy and head asymmetry following frontotemporal craniotomy: A retrospective analysis of clinical factors and volumetric comparison
- Prognostic value of temporalis muscle thickness as a marker of sarcopenia in intracerebral hemorrhage
- Temporal muscle thickness as a feasible sarcopenia marker and outcome predictor after aneurysmal subarachnoid hemorrhage
- Temporal muscle thickness and index predict overall survival after surgical evacuation of spontaneous intracerebral hemorrhage
- Addressing Temporal Muscle Atrophy and Enhancing Cranioplasty Outcome: A Technical Note
- Comment on "Reduced temporal muscle thickness predicts shorter survival in patients undergoing chronic subdural haematoma drainage" by Korhonen et al.-The authors' reply
- Temporal Muscle Thickness as a Prognostic Marker in a Real-Life Cohort of Newly Diagnosed MGMT Promoter Methylated Glioblastoma: A Multicentric Imaging Analysis

In patients with CSDH, TMT measurements from preoperative imaging were reliable and contained prognostic information supplemental to previously known predictors of poor outcomes [1].

High TMT was robustly associated with head trauma sequelae but was also associated with good clinical outcomes in TBI patients. These findings consolidate the significance of TMT as an objective marker of frailty in TBI patients; such measurements may ultimately be leveraged as prognostic indicators [2].

Measuring temporal muscle thickness (TMT) has appeared to be a promising new surrogate marker for skeletal muscle mass and sarcopenia, which further indicates frailty and predicts overall survival (OS). The aim of a study was to determine its usefulness as a prognostic marker in patients with high-grade glioma compared to functional status scales.

TMT was measured in preoperative axial T1-weighted contrast-enhanced magnetic resonance images in 277 patients who received surgical treatment for newly diagnosed WHO III and IV gliomas in our institution between 2015 and 2020. Clinical Frailty Scale (CFS) and Karnofsky Performance Scale (KPS) were assessed preoperatively and during a follow-up visit.

Female gender has shown a significant correlation with TMT, while TMT did not correlate with preoperative and follow-up functional scores, age, WHO classification, IDH mutation, MGMT promoter methylation, EGFR and ATRX expression, or 1p/19q co-deletion. No significant prognostic value of TMT could be shown in 6, 12, and 24 months OS, while changes in CFS and KPS proved to have a significant impact.

Only the female gender, but no other clinical, histological, or molecular marker showed any interrelation with TMT. Functional scores outclass measuring TMT as a reliable prognostic factor for predicting OS in patients with high-grade glioma [3].

Reduced temporal muscle thickness (TMT) was verified as an independent negative prognostic parameter for intracranial tumor outcome patients. Independent thereof, chronic subdural hematoma (CSDH) is a neurosurgical condition with high recurrence rates and unreliable risk models for poor outcomes. Since sarcopenia was associated with poor outcomes, we investigated the possible role of TMT and the clinical course of CSDH patients.

This investigation is a single-center retrospective study on patients with CSDH. Dubinski et al. analyzed the radiological and clinical data sets of 171 patients with surgically treated CSDH at a University Hospital from 2017 to 2020.

The analysis showed a significant association between low-volume TMT and increased hematoma volume (p < 0.001), poor outcome at discharge (p < 0.001), and reduced performance status at 3 months (p < 0.002).

TMT may represent an objective prognostic parameter and assist in the identification of vulnerable CSDH patients [4].

Temporal muscle thickness as a glioblastoma prognostic marker

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[1)]
Korhonen TK, Arponen O, Steinruecke M, Pecorella I, Mee H, Yordanov S, Viaroli E, Guilfoyle MR, Kolias A, Timofeev I, Hutchinson P, Helmy A. Reduced temporal muscle thickness predicts shorter survival in patients undergoing chronic subdural haematoma drainage. J Cachexia Sarcopenia Muscle. 2024 May 8. doi: 10.1002/jcsm.13489. Epub ahead of print. PMID: 38720242.
[2)]

Dubinski D, Won SY, Meyer-Wilmes J, Trnovec S, Rafaelian A, Behmanesh B, Cantré D, Baumgarten P, Dinc N, Konczalla J, Wittstock M, Bernstock JD, Freiman TM, Gessler F. Frailty in Traumatic Brain Injury-The Significance of Temporal Muscle Thickness. J Clin Med. 2023 Dec 11;12(24):7625. doi: 10.3390/jcm12247625. PMID: 38137693; PMCID: PMC10743381.

3)

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4)

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