# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

10 Jun 2026

## The Effect of Muscle Energy Technique on Temporomandibular Joint Motion in People with Trismus of Chewing Muscles due to Third Molar Surgery

## Protocol summary

**Study aim**

Determining the effectiveness of Muscle Energy Technique in increasing the maximum mouth opening after third molar surgery

**Design**

Clinical trial with intervention group and control group, randomized, On 48 patients, randomized permutated blocks were used for randomization.

**Settings and conduct**

This study will be performed in the Neuromuscular Rehabilitation Research Center of Semnan University of Medical Sciences in such a way that patients are randomly placed in one of the intervention or control groups, the intervention group receives MET from the first day after surgery for seven days and the control group does not receive any intervention.

**Participants/Inclusion and exclusion criteria**

Inclusion criteria: People with inability to open their mouth after third molar extraction with an interincisal distance of less than 40 mm, people who have had 24 hours of third molar surgery, people with pain and spasm in the masticatory muscles after third molar surgery, Age between 18 and 35 years; Exclusion criteria: Degenerative Temporomandibular Joint (TMJ) arthritis, Inflammatory TMJ arthritis, Infective TMJ arthritis, Malignant tumors of the face and jaw, History of dislocation of TMJ, History of fracture of TMJ, History of previous surgery of jaw or TMJ, Hypermobile TMJ

**Intervention groups**

The intervention group: receives Muscle Energy Technique (MET), the control group: does not receive any intervention. In this study, to perform the MET, the patient is asked to open his mouth for 10 seconds in front of the therapist's hand under the jaw. This process is repeated 5 times in each session and after each time the jaw is moved to a newer domain before repeating the technique. This technique is performed daily for seven days from the first day after surgery.

**Main outcome variables**

The degree of displacement of the Temporomandibular Joint condyle on the X and Y axis, Maximum Mouth Opening, Pain

## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20211016052783N1**
Registration date: **2022-01-27, 1400/11/07**
Registration timing: **registered_while_recruiting**

Last update: **2022-01-27, 1400/11/07**
Update count: **0**

**Registration date**

2022-01-27, 1400/11/07

**Registrant information**

**Name**

Fatemeh Noormohammadi Ghomi

**Name of organization / entity**

**Country**

Iran (Islamic Republic of)

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+98 21 7794 8173

**Email address**

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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2021-12-22, 1400/10/01

**Expected recruitment end date**

2022-02-20, 1400/12/01

**Actual recruitment start date**
empty
**Actual recruitment end date**
empty
**Trial completion date**
empty

**Scientific title**
The Effect of Muscle Energy Technique on Temporomandibular Joint Motion in People with Trismus of Chewing Muscles due to Third Molar Surgery

**Public title**
The effect of Muscle Energy Technique on Trismus after third molar surgery
**Purpose**
Treatment
**Inclusion/Exclusion criteria**
**Inclusion criteria:**
People with an inability to open their mouth after third molar surgery that has less than 40 mm interincisal distance People who have had 24 hours of third molar surgery People with pain and spasm in the masticatory muscles after third molar surgery Surgery of all patients is performed by a same surgeon and a same assistant surgeon in the same conditions and under local anesthesia
**Exclusion criteria:**
Degenerative Temporomandibular joint arthritis Inflammatory Temporomandibular joint arthritis Infective Temporomandibular joint arthritis Malignant tumors of the face and jaw History of dislocation of Temporomandibular joint History of fracture of Temporomandibular joint History of previous surgery of jaw or Temporomandibular joint Hypermobile Temporomandibular joint
**Age**
From **18 years** old to **35 years** old
**Gender**
Both

**Phase**
N/A
**Groups that have been masked**
*No information*
**Sample size**
Target sample size: **48**
**Randomization (investigator's opinion)**
Randomized
**Randomization description**
In this study, we use the randomized permutation block method for random assignment. The procedure will be as follows: quadruple blocks with a combination of A and B ( group A intervention and group B control ) will be the criteria for action. Given that in quadruple blocks, six different combinations of blocks can exist, a number is assigned to each block (from 1 to 6). The number of blocks is as follows: Block 1: AABB Block 2: BBAA Block 3: ABBA Block 4: BAAB Block 5: ABAB Block 6: BABA Using a table of random numbers, considering the numbers 1 to 6 and deleting the numbers 0, 7, 8 and 9, respectively, the blocks are selected and the way of allocating patients for each of the groups A and B is done according to the selected blocks. Obviously, the list obtained from this method of allocation will be completely random and balanced. After preparing a randomization list for each patient, they will have a number in order of enrollment (from 1 to 48). A sealed envelope is prepared with A or B written inside the envelope based on the compiled list. The researcher, who is not aware of the main list, after registering the patient who entered the study and checking the person's number, takes the relevant envelope and opens it in the patient's bedside and realizes the type of intervention based on the contents of the envelope. In this way, the researcher is not aware of the list and only after the patient entered into the study and finding out if he/she is qualified, he/she realizes the type of intervention by opening the envelope.
**Blinding (investigator's opinion)**
Not blinded
**Blinding description**
**Placebo**
Not used
**Assignment**
Parallel
**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**
**Name of ethics committee**
Ethics committee of Semnan University of Medical Sciences
**Street address**
Headquarters of Semnan University of Medical Sciences and Health Services, Basij Blvd
**City**
Semnan
**Province**
Semnan
**Postal code**
3514799442
**Approval date**
2021-10-31, 1400/08/09
**Ethics committee reference number**
IR.SEMUMS.REC.1400.187

## Health conditions studied

### 1

**Description of health condition studied**
Trismus following Third Molar Surgery
**ICD-10 code**
R25.2
**ICD-10 code description**
Cramp and spasm

## Primary outcomes

### 1

**Description**
The degree of displacement of the Temporomandibular Joint Condyle on the X-axis
**Timepoint**
On the first day after surgery before and after the intervention and then on the 7th day after surgery (end of the intervention period)
**Method of measurement**
By Sonography and MATLAB program

### 2

**Description**
The degree of displacement of the Temporomandibular Joint Condyle on the Y-axis
**Timepoint**
On the first day after surgery before and after the intervention and then on the 7th day after surgery (end of the intervention period)
**Method of measurement**
By Sonography and MATLAB program

## Secondary outcomes

### 1

**Description**
Maximum mouth opening
**Timepoint**
On the first day after surgery before and after the intervention and then on the 7th day after surgery (end of the intervention period)
**Method of measurement**
Use caliper that is calibrated in millimeter

### 2

**Description**
Intensity of pain
**Timepoint**
On the first day after surgery before and after the intervention and then on the 7th day after surgery (end of the intervention period)
**Method of measurement**
Use Visual Analogue Scale

## Intervention groups

### 1

**Description**
Intervention group: Muscle energy technique, In a seated position the subject is asked to open the mouth to its comfortable limit, the operator then placed one hand around the subject's jaw, while the other hand grasped the head for stability, the subject is then asked to attempt open the mouth for 10 seconds against the resistance applied by the operator's hand placed below the jaw, this reciprocal inhibition procedure is repeated five times, After each time, the jaw is moved to a new barrier before repeating the technique. this technique is performed from the first day after surgery daily for seven days.
**Category**
Rehabilitation

### 2

**Description**
Control group: They do not receive any intervention.
**Category**
Rehabilitation

## Recruitment centers

### 1

**Recruitment center**
**Name of recruitment center**
Neuromuscular Rehabilitation Research Center of Semnan University of Medical Sciences
**Full name of responsible person**
Fatemeh Noormohamadi ghomi
**Street address**
Neuromuscular Rehabilitation Research Center of Semnan University of Medical Sciences, Tabatabai Clinic, next to Nemat Ice Cream, Ghods Blvd
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## Sponsors / Funding sources

### 1

**Sponsor**
**Name of organization / entity**
Semnan University of Medical Sciences
**Full name of responsible person**
Majid Mirmohammadkhani
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**Email**

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**Grant name**

**Grant code / Reference number**

**Is the source of funding the same sponsor organization/entity?**

Yes

**Title of funding source**

Semnan University of Medical Sciences

**Proportion provided by this source**

100

**Public or private sector**

Public

**Domestic or foreign origin**

Domestic

**Category of foreign source of funding**

*empty*

**Country of origin**

**Type of organization providing the funding**

Academic

## Person responsible for general inquiries

**Contact**

**Name of organization / entity**

Semnan University of Medical Sciences

**Full name of responsible person**

Fatemeh Noormohammadi ghomi

**Position**

Student

**Latest degree**

Bachelor

**Other areas of specialty/work**

Physiotherapy

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## Person responsible for scientific inquiries

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## Person responsible for updating data

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**Position**

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**Latest degree**

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**Other areas of specialty/work**

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## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**

No - There is not a plan to make this available

**Justification/reason for indecision/not sharing IPD**

There is no more information.

**Study Protocol**

No - There is not a plan to make this available

**Statistical Analysis Plan**

No - There is not a plan to make this available

**Informed Consent Form**

No - There is not a plan to make this available

**Clinical Study Report**

No - There is not a plan to make this available

**Analytic Code**

No - There is not a plan to make this available

**Data Dictionary**

No - There is not a plan to make this available