

Clinical Trial Protocol

Iranian Registry of Clinical Trials

20 Jun 2026

Comparison of canine retraction and anchorage loss rate by NiTi coils versus elastomeric chains: A randomized split-mouth study

Protocol summary

Study aim

to compare canine retraction and anchorage loss rate using NiTi closed coil spring and elastomeric power chains in maxillary first premolar extraction cases

Design

Randomized, Split mouth, 25 patients, blinded outcome assessment

Settings and conduct

Study will be performed prospectively at department of orthodontics, Shahid Beheshti University of medical sciences, Tehran, Iran. Following alignment and leveling, a maxillary dental cast will be taken. Four months after canine retraction, another cast will be taken. Amount of canine movement during this period will be calculated. Outcome assessment will be performed by a calibrated orthodontist who is blind to the intervention group.

Participants/Inclusion and exclusion criteria

Inclusion criteria: • Generally healthy patients • Age 13 to 25 years • needed maxillary first premolar extraction as a part of orthodontic treatment • Straight wire fixed orthodontic appliance • No anchorage control or inter-arch elastic was indicated at the first 4 months of treatment • All permanent teeth were present and erupted (not considering 2nd and 3rd molars) Exclusion criteria: • Systemic disease that could influence tooth movement • Taking medication that could influence tooth movement • Craniofacial syndromes • Pregnancy

Intervention groups

First orthodontic brackets will be placed on maxillary teeth. Then, first premolars of the maxilla will be extracted and orthodontic alignment and leveling of the teeth will be done. Following placement of 19*25 stainless steel wire, extraction space closure using frictional mechanics will be initiated. At this stage, each maxillary canine will be randomly retracted using elastomeric chain (American Orthodontics) on one side of the mouth and 9 mm NiTi closed coil spring (American Orthodontics) on the other side of the mouth.

Main outcome variables

Canine retraction rate anchorage loss rate (First molar movement)

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20161126031100N1**

Registration date: **2019-03-09, 1397/12/18**

Registration timing: **retrospective**

Last update: **2019-03-09, 1397/12/18**

Update count: **0**

Registration date

2019-03-09, 1397/12/18

Registrant information

Name

Saeed Reza Motamedian

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 2240 8071

Email address

motamedian@sbm.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2017-10-01, 1396/07/09

Expected recruitment end date

2018-02-28, 1396/12/09

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of canine retraction and anchorage loss rate by NiTi coils versus elastomeric chains: A randomized split-mouth study

Public title

Comparison of two canine retraction methods

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

Generally healthy patients Age 13 to 25 years Needed maxillary first premolar extraction as a part of orthodontic treatment Straight wire fixed orthodontic appliance No anchorage control or inter-arch elastic was indicated at the first 4 months of treatment All permanent teeth were present and erupted (not considering 2nd and 3rd molars)

Exclusion criteria:

Systemic disease that could influence tooth movement
Taking medication that could influence tooth movement
Craniofacial syndromes Pregnancy

Age

From **13 years** old to **25 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Outcome assessor
- Data analyser

Sample size

Target sample size: **25**

More than 1 sample in each individual

Number of samples in each individual: **2**

Maxillary canine retraction rate on the left and right sides of the mouth

Randomization (investigator's opinion)

Randomized

Randomization description

Each method will be used on one side which was selected randomly for each patient. The first half of the patients will be randomized to the treatment sequence A-B and the other half to the treatment sequence B-A (A: elastomeric chain and B: NiTi coil)

Blinding (investigator's opinion)

Single blinded

Blinding description

All measurements will be performed by a calibrated orthodontist who is blind to the retraction method. Also, statistical analysis will be performed by an expert who is blind to the type of intervention.

Placebo

Not used

Assignment

Other

Other design features

Split mouth

Secondary Ids

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Ethic committee of Shahid Beheshti University of Medical Sciences

Street address

Velenjak

City

Tehran

Province

Tehran

Postal code

19813

Approval date

2018-10-14, 1397/07/22

Ethics committee reference number

IR.SBMU.DRC.REC.1397.022

Health conditions studied**1****Description of health condition studied**

Malocclusion

ICD-10 code

K07.3

ICD-10 code description

Anomalies of tooth position

Primary outcomes**1****Description**

Canine retraction rate

Timepoint

Before intervention, 4 months after intervention

Method of measurement

The distance between canine cusp tip and the line connection first rugae will be measured on occlusograms using a digital caliper. This amount will be divided to 4 to show canine retraction rate per month.

Secondary outcomes**1****Description**

Anchorage loss

Timepoint

before intervention and 4 months after intervention

Method of measurement

The distance between mesiobuccal cusp of first molar and the line connection first rugae will be measured on occlusograms using a digital caliper. This amount will be

divided to 4 to show anchorage loss rate per month.

Intervention groups

1

Description

Intervention group: Amount of canine retraction on one side of the maxilla using 9 mm NiTi closed coil (American Orthodontics) with 200 grams force during 4 months.

Category

Treatment - Devices

2

Description

Intervention group: Amount of canine retraction on one side of the maxilla using elastomeric chain (American Orthodontics) with 200 grams force during 4 months.

Category

Treatment - Devices

Recruitment centers

1

Recruitment center

Name of recruitment center

Department of orthodontics, Shahid Beheshti university of medical sciences

Full name of responsible person

Saeed Reza Motamedian

Street address

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13819

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+98 21 2240 8071

Email

sr.motamedian@yahoo.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Shahid Beheshti University of Medical Sciences

Full name of responsible person

Azita Tehranchi

Street address

Velenjak, School of Dentistry, Shahid Beheshti University of Medical Sciences

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Grant name

School of Dentistry, Shahid Beheshti university of medical sciences

Grant code / Reference number

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

Yes

Title of funding source

Shahid Beheshti 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

Shahid Beheshti University of Medical Sciences

Full name of responsible person

Saeed Reza Motamedian

Position

Assistant Professor

Latest degree

Specialist

Other areas of specialty/work

Dentistry

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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

Yes - There is a plan to make this available

Study Protocol

Yes - There is a plan to make this available

Statistical Analysis Plan

Yes - There is a plan to make this available

Informed Consent Form

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

Amount of canine movement per month for each patient and for each technique Amount of first molar movement per month for each patient and for each technique

When the data will become available and for how long

starting immediately after publication

To whom data/document is available

This will be only available for people working in academic institutions.

Under which criteria data/document could be used

Non-commercial use

From where data/document is obtainable

Email: sr.motamedian@yahoo.com

What processes are involved for a request to access data/document

1- Sending request email including the purpose of using data and your personal information 2- Data will be sent in one week

Comments