The role of muscle function in internal derangements of the jaw joint

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Joint disorders
Study type	Observational invasive

Summary

ID

NL-OMON31756

Source
ToetsingOnline

Brief title
jaw joint internal derangements

Condition

- Joint disorders

Synonym
Open-lock; difficulty with jaw closure

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Centrum Tandheelkunde Amsterdam - ACTA
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: biomechanical modeling, hypermobility, jaw joint, muscle function

Outcome measures

Primary outcome

Boundary conditions fot jaw joint morphology.

Boundary conditions for muscle activation patterns.

Secondary outcome

not applicable.

Study description

Background summary

From a clinical perspective it is crucial to obtain insight in the normal and disturbed dynamics of the lower jaw. Patients with the craniomandibular dysfunction (CMD) syndrome often complain not only about pain in the masticatory muscles or the jaw joint, but also about a disturbance in the movement possibilities of the lower jaw. They may have problems opening or closing the mouth or hear annoying sounds from the joints during jaw movements. Generally, the disturbances of jaw movements are caused by aberrations in shape or mutual position (internal derangements - ID) of the various structures of the jaw joint. A common type of ID is a symptomatic hypermobility. It is more prevalent with women than with men and occurs in individuals where the mandibular condyle travels beyond the articular eminence during wide opening of the mouth. This movement itself, however, does not necessarily lead to symptomatic hypermobility as this occurs in about 50% of experimental subjects without accompanying movement disturbances. Although this disorder is relatively mild by nature, it can develop into a so-called 'open-lock', where the subject is unable to close the mouth adequately. It is thus far unknown which factors are involved in the development of the serious clinical variant.

Study objective

The objective of the study is to discover if in patients with hypermobility of the jaw joint, an 'open-lock' syndrome can come into existence as a consequence of aberrant activation pattern of the masticatory musculature.

Study design

Jaw movements and accompanying activation patterns of the superficial masticatory muscles will be registered for patients with a so-called intermittent 'open-lock' syndrome (patients with a hypermobile jaw joint which sometimes have and sometimes don't have problems closing the mouth). These registrations will be compared with those of subjects that do have a hypermobile jaw joint but do not suffer from an intermittent 'open-lock' syndrome.
In order to enable determination of a causal relationship between muscle use and movement problems biomechanical models will be constructed tailored to these patients. They will be used to analyze the consequences of aberrant muscle activation patterns for jaw movement possibilities and limitations in the relevant subject. These will assist in assessing the boundary conditions in terms of muscle activation for a smooth closing of the mouth after being opened wide. Furthermore, it enables prediction of aberrant movements and movement limitations caused by aberrant muscle activation patterns. The latter will be verified using the obtained jaw movement and EMG registrations.
In order to construct biomechanical models tailored to the patients, their relevant geometry (shape of the jaw joints, thickness and attachment sites of the masticatory muscles) have to be assessed. This will be performed with modern imaging techniques such as MRI and Cone Beam CT.

Study burden and risks

The burden is primarily associated with time.
The risks of registrations of jaw movement and of MRI are negligible.
The risks of registration with CT are only relevant if, apart from the proposed study, the subjects have received or will receive radiation with an amount that comes close to what is considered acceptable.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

symptomatic hypermobility of the jaw joint
intermittant occurrence of open-lock

Exclusion criteria

Serious general health impairment
Complicated dental abnormalities
Osteoarthritis of the jaw joint

Study design

Design

Study type: Observational invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	15-06-2009
Enrollment:	30
Type:	Actual

Ethics review

Approved WMO

Date:	10-09-2008
Application type:	First submission
Review commission:	METC Amsterdam UMC

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL18726.029.07