

# A study of arthritic mechanism of the temporomandibular joint disorders

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# 2007 Fiscal Year Final Research Report Summary

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## A study of arthritic mechanism of the temporomandibular joint disorders

Research Project

### Project/Area Number

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17592069

### Research Category

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Grant-in-Aid for Scientific Research (C)

### Allocation Type

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Single-year Grants

### Section

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一般

### Research Field

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Surgical dentistry

### Research Institution

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Kanazawa University

### Principal Investigator

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### Co-Investigator(Kenkyū-buntansha)

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### Project Period (FY)

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2005 – 2007

### Keywords

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temporomandibular disorder / articular disc / synovial fluid / aggrecanase(ADAMTS) / matrix metalloproteinase(MMP) / fibrous adhesion

### Research Abstract

1. Experimental study of temporomandibular joint arthritis in the rabbits

Proteolytic activities of the temporomandibular arthritis have been investigated using a rabbit model of temporomandibular disorders. Histopathologic examination has been achieved on the arthritis caused by an artificial dislocation of the articular disc. Throughout the examination period, histoimmunohistochemical staining showed expression of proteolytic enzymes such as matrix metalloproteinases (MMPs) and aggrecanase(ADAMTS). Especially in the critical destructive period, specimens showed higher incidence of enzymatic expression. Expression of type I and H collagen stain were also noticed in the cartilage layer of the mandibular condyle. Distribution of these components differed according to the destruction periods.

2. Analyses of the clinically harvested materials

Histopathologic and biochemistic examination have been carried out using human materials of synovial fluid and biopsy tissue from the upper joint compartment of the temporomandibular joints, under informed consent. In patients with prominent arthritic changes on Milk showed higher incidence of MMP5 and ADAMTS. During cartilage matrix destruction, ADAMTS first acts on proteoglycan breakdown, then MMPs act on proteoglycan and collagen breakdown. These enzymatic expressions have been noticed in RA patients in the field of Orthopedic Surgery. Conversely in the present study, high incidence of both enzymatic activities has been noticed in the temporomandibular joints. From the results, arthritis may be mild in the temporomandibular joints. Harvested adhesion tissue via arthroscopic surgery showed a number of fibro-blastic cells. Specimens from advanced stage of arthritis showed ossification or cartilaginous degeneration. These lesions are frequently showed in preoperative MRI images.

## Research Products (69 results)

All	2008	2007	2006	2005
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All	Journal Article (32 results) (of which Peer Reviewed: 16 results)	Presentation (37 results)
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[Journal Article] 高周波メスを用いた顎関節鏡視下剥離授動術	2008	▼
[Journal Article] Comparison of the stress direction on the TMJ in patients with class I, II, and III skeletal relationships	2008	▼
[Journal Article] Surgical method for catheter placement via the occipital artery by an approach from the posterior of the mastoid process	2008	▼
[Journal Article] Arthroscopic surgery using radio-frequency frequency	2008	▼
[Journal Article] Comparison of the stress direction on the TMJ in patients with class I, II, and III skeletal relationships	2008	▼
[Journal Article] Surgical method for catheter placement via the occipital artery by an approach from the posterior of the mastoid process	2008	▼
[Journal Article] 顎形態異常を骨延長法により治療した基底細胞母斑症候群の1例	2007	▼
[Journal Article] 非喫煙者・非飲酒者における口腔扁平上皮癌の臨床的検討	2007	▼
[Journal Article] 顎形態異常を有する基底細胞母斑症候群患者に顎矯正手術を施行した1例	2007	▼
[Journal Article] A case of basal cell nevus syndrome with jaw deformity treated by maxillary distraction osteogenesis	2007	▼
[Journal Article] Oral squamous cell carcinoma in nonusers of tobacco and alcohol	2007	▼
[Journal Article] A case of basal cell nevus syndrome patient who underwent orthognathic surgery	2007	▼
[Journal Article] 筋緊張性ジストロフィー患者に対し全身麻酔下に顎矯正術を施行した1例	2006	▼
[Journal Article] Expression of matrix metalloproteinases and aggrecanase in the synovial fluids of patients with symptomatic temporomandibular disorders	2006	▼
[Journal Article] The change of stress distribution on the condyle after mandibular setback surgery	2006	▼
[Journal Article] An experience of orthognathic surgery in a patient with myotonic dystrophy under general anesthesia	2006	▼
[Journal Article] Expression of matrix metalloproteinases and aggrecanase in the synovial fluids of patients with symptomatic temporomandibular disorder	2006	▼

[Journal Article] The change of stress distribution on the condyle after mandibular setback surgery	2006	▼
[Journal Article] Disc and condyle translation in patients with temporomandibular disorder	2005	▼
[Journal Article] A comparative study of unilateral dislocated mandibular condyle fractures in the rabbits	2005	▼
[Journal Article] Aggrecanase analysis of synovial fluid of temporomandibular joint disorders	2005	▼
[Journal Article] The relationship between temporomandibular joint disc morphology and stress angulation in skeletal class III patients	2005	▼
[Journal Article] Changes in condylar long axis and skeletal stability after bilateral saggital split ramus osteotomy with poly-1-lactic acid or titanium plate fixation	2005	▼
[Journal Article] 上顎歯肉の腫脹を主訴に来科した多発性骨髄腫の1例	2005	▼
[Journal Article] 上顎洞を充滿した上顎第二大臼歯由来含歯性嚢胞の1例	2005	▼
[Journal Article] Disc and condyle translation in patients with temporomandibular disorder	2005	▼
[Journal Article] A comparative study of unilateral dislocated mandibular condyle fractures in the rabbit	2005	▼
[Journal Article] Aggrecanase analysis of synovial fluid of temporomandibular joint disorders	2005	▼
[Journal Article] The relationship between temporomandibular joint disc morphology and stress angulation in skeletal class III patients	2005	▼
[Journal Article] Changes in condylar long axis and skeletal stability after bilateral saggital split ramus osteotomy with poly-i-lactic acid or titanium plate fixation	2005	▼
[Journal Article] A case of multiple myeloma presenting the swelling in the maxillary gingival	2005	▼
[Journal Article] A case of follicular dental cyst arising from the second maxillary molar, occupying maxillary sinus	2005	▼
[Presentation] Relationship between clinical manifestations and arthroscopic findings in the upper joint compartment of the patients with temporomandibular disorders	2008	▼
[Presentation] A case of idiopathic resorption of condyle and mandibular ramus accompanied with spinal leakage	2007	▼
[Presentation] A difficult to diagnose case of non-supprative acute -arthritis of the temporomandibular joint	2007	▼
[Presentation] 下顎頭から下顎枝に及ぶ吸収を伴った髄液漏の1例	2007	▼
[Presentation] 診断に苦慮した非化膿性急性関節炎の1例	2007	▼
[Presentation] 咬合形態が顎関節症状に及ぼす影響について	2007	▼
[Presentation] Effect of occlusal disharmony on temporomandibular joint disorder	2007	▼
[Presentation] 非喫煙・非飲酒者における早期口腔扁平上皮癌の臨床的硏究	2007	▼
[Presentation] ral squamous cell carcinoma in nonusers of tobacco and alcohol	2007	▼
[Presentation] Postoperative features following surgical reduction to internal derangement of the temporomandibular joint	2006	▼
[Presentation] Implant placement after distraction osteogenesis in edentulous maxilla: Report of a case	2006	▼
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[Presentation] Recovery of condylar translation following arthroscopic surgery temporomandibular joint	2006	▼
[Presentation] Alveolar bone thickness as a factor of implant stability in patients with sinus floor elevation	2006	▼
[Presentation] Condylar and disc position after saggital split ramus osteotomy with and without Le Fort I osteotomy	2006	▼
[Presentation] Recovery of condylar translation following arthroscopic surgery of the temporomandibular joint	2006	▼
[Presentation] Alveolar bone thickness as a factor of implant stability in patients with sinus floor elevation	2006	▼
[Presentation] Condylar and disc position after saggital split ramus osteotomy with and without Le Fort I osteotomy	2006	▼
[Presentation] 関節鏡視下手術と関節円板整位術の予後の比較	2006	▼
[Presentation] 下顎枝垂直骨切り術とLe Fort I 骨切り術後の下顎頭と関節円板の位置変化	2006	▼
[Presentation] Outcome differences between lysis and lavage of arthroscopy and open surgical disc repositioning of the TMJ	2006	▼
[Presentation] Condylar and disc position after intraoral vertical ramus osteotomy with and without Le Fort I osteotomy	2006	▼
[Presentation] A case of multiple jaw cysts accompanied by double jaw impacted teeth	2006	▼
[Presentation] 上下顎に生じた埋伏歯を伴う多発性顎嚢胞の1例	2006	▼
[Presentation] 多数の腫瘍を認めた顎関節滑膜軟骨腫症の2例	2005	▼
[Presentation] 急性化膿性顎関節炎の1例	2005	▼
[Presentation] Two cases of synovial chondromatosis of the TMJ accompanied by multiple tumor pieces	2005	▼
[Presentation] A case of acute suppurative arthrosis of the TMJ	2005	▼
[Presentation] Early oral squamous cell carcinoma in never-smokers and never-drinkers	2005	▼
[Presentation] Early oral squamous cell carcinoma in never-smokers and never-drinkers	2005	▼
[Presentation] Correlation between arthroscopic findings and enzymatic activities of synovial fluid in the upper joint compartment of the temporomandibular joint	2005	▼
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[Presentation] 顎形態異常を有する基底細胞母斑症候群患者に対し骨延長法を応用した1治験例	2005	▼
[Presentation] A case of basal cell nevus syndrome with jaw deformity treated by maxillary distraction osteogenesis	2005	▼
[Presentation] 高周波電気メスを用いた関節鏡視下手術前後のMRI所見の変化	2005	▼
[Presentation] Postoperative change of MRI findings followed by arthroscopic surgery using radio-active electrocautery of the TMJ	2005	▼

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