

## Long Term Follow Up in Patients with Radiologically Loose Trapeziometacarpal Total Joint Implants

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### Abstract

Total trapeziometacarpal joint arthroplasty often fails leading to secondary trapeziectomy. In this study we reviewed five patients with radiological early signs of implant loosening already 12 months after trapeziometacarpal joint replacement with the MOJE Acamo uncemented joint prosthesis to investigate whether the patients developed progressing symptoms. The observation time was eight years. One patient was not able to participate. DASH-scores and X-rays were obtained and clinical examinations done. We found radiologically progressing migration of both implants in all patients after eight years. All patients however reported normal to slightly reduced daily level of function and no to little pain in their hand. Also clinical examination showed satisfying results. It seems that satisfying results can be obtained despite radiological evidence of implant loosening and migration justifying a more conservative approach to revision surgery with the MOJE Acamo prosthesis. A possible explanation of the clinical results is the very large ball-and-socket design of the implant, which seems to retain joint stability and prevent painful luxation of the trapeziometacarpal joint.

**Keywords:** Trapeziometacarpal osteoarthritis; Total joint arthroplasty; Cementless joint arthroplasty; Implant loosening

### Introduction

Total joint arthroplasty has been used for more than 40 years [1] in Trapeziometacarpal (TMC) joint osteoarthritis replacing the TMC joint with a small ball-and-socket joint. Compared to trapeziectomy total joint arthroplasty may result in faster rehabilitation and better grip strength after one year [2], but unfortunately high loosening rates of TMC total joint arthroplasty components have been reported both in cemented and cementless implants [3-12]. The fixation of uncemented implants relies on press-fit fixation until secondary bony fixation of the implant is obtained, and early implant failure within the first year after surgery may be the result of failure of either the primary or the secondary fixation. In this study we reviewed five patients with known early migration of TMC joint implants.

### Materials and Methods

In 2006 we treated nine patients with trapeziometacarpal joint osteoarthritis using a total joint replacement with the MOJE Acamo CMC cementless implant [6]. Within the following 12 months three patients had a revision surgery because of symptomatic loosening of the implant, and we found radiological signs of loosening in the remaining patients. In this study we wanted to review the remaining five patients that did not undergo revision surgery to see if the clinical failure rate was progressing.

One patient was revised after five years leaving five patients with the implants still in situ for follow-up. The patients were three women and two men with a mean age of 69 years (range 61-76), and the observation time was eight years in all patients. The implant used was the MOJE Acamo CMC ceramic implant coated with Bioverit. The

design of the Moje Acamo CMC implant is a very large ball-and-socket joint, ensuring stability of motion in all directions. The ball-and-socket design in this implant is reversed compared to traditional ball-and-socket designs for the TMC joint with the ball placed in the trapezium and the socket in the first metacarpal. The trapezium component has a peg and a very large Bioverit-coated surface for bone contact (Figure 1). Implantation is done using cementless press-fit-technique.



**Figure 1:** X-ray of thumb day 1 after surgery. Well placed MOJE Acamo prosthesis right after total TMC joint replacement surgery.

The patients were interviewed and examined by the first author, a Danish validated version of the Quick Dash Score [13] was calculated and radiographs of the TMC joint taken. One of the male patients could not participate because of severe dementia. Instead the patient's medical journal was reviewed to make sure the patient had not been treated for this condition at another hospital. There was no medical file suggesting that the patient had any severe symptoms from the thumb.

## Results

In all five patients we found radiological evidence of progressing osteolysis around both implants (Figure 2) within 12 months after surgery. After 8 years there was visible migration of both implants (Figure 3) in all patients participating in the follow-up, however all four patients reported normal to slightly reduced daily level of function (Quick DASH score of 2,3, 4,5, 12,5 and 22,7) with no to little pain in their hand (VAS 0 to 4 on a scale from 0 to 10).



**Figure 2:** X-ray of thumb 12 months after surgery. Same patient as in Figure 1. There are clear signs of osteolysis around the implant.

All four patients were able to pinch grip to the ulnar fingers with varying degrees of strength restriction. Only one patient could not reach the base of the fifth finger (gap of 3 cm). Two patients showed restriction in abduction of 7% and 10 % respectively of opposite thumb; the two others had no restrictions. Grip strength as a percentage of the opposite hand was 59%, 76%, 103% and 104%.



**Figure 3:** X-ray of thumb 8 years after surgery. Same patient as in Figure 1 and 2. Only little further migration of the implant is seen compared to Figure 2.

## Discussion

Kaszap et al. [14] treated 12 patients with the Moje Acamo CMC prosthesis and reviewed all the patients at a mean of 50 months postoperatively. In all patients they found signs of loosening, migration or tilting of one or both implant components, and nine patients were symptomatic enough to warrant revision surgery with removal of the implant. At the last follow-up patients still possessing an implant showed progressive signs of implant loosening, although some of them had no symptoms.

In our study four patients had been revised due to symptomatic implant loosening, but the remaining five patients did not have symptoms warranting revision. At follow-up we found that all four participating patients had clinically satisfying results eight years after trapeziometacarpal joint replacement compared to well functioning

implants [15,16] in spite of radiologically loose implants with migration.

The results suggest that with the MOJE Acamo CMC ceramic implant, the very large ball-and-socket design may function even in loose and migrating components. This may probably be due to retaining joint stability compared to smaller ball-and-socket implants where joint subluxation or total luxation may occur in loose and migrating implants leading to symptoms and a need of revision [3-12]. This indicates that future research should not only be addressed into implant fixation but also into implant joint kinematics, if the survival rate of TMC total joint arthroplasty should be improved.

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