



Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en



Case report

Mechanical failure of the Coonrad-Morrey linked total elbow arthroplasty: A case report



T.T. Pham, N. Bonnevalle, M. Rongières, P. Bonnevalle, P. Mansat*

Institut de l'appareil locomoteur du CHU de Toulouse, Département d'Orthopédie et traumatologie, Hôpital Pierre-Paul-Riquet, place du Docteur-Baylac, 31059 Toulouse Cedex, France

ARTICLE INFO

Article history:
 Accepted 25 July 2014

Keywords:
 Elbow
 Prosthesis
 Polyethylene wear
 Hinge
 Revision surgery
 Axle mechanism

ABSTRACT

Semiconstrained (linked design) total elbow arthroplasty is indicated in a wide variety of cases. Long-term survival is better than with non-linked prostheses. However, mechanical failure of the hinge mechanism is a complication that may occur during follow-up. We report a case of failure of the axle assembly of a Coonrad-Morrey elbow prosthesis 8 years after implantation for nonunion of a supracondylar distal humerus fracture. Initial revision surgery included changing the axle and the polyethylene bushings. Revision surgery was necessary 1 year later when the axle failed again. A custom-designed locking axle had to be used to stabilize the hinge mechanism. After 3 years follow-up, the hinge was intact, there was no loosening of the components and function of the elbow was good.

© 2014 Elsevier Masson SAS. All rights reserved.

1. Introduction

Total elbow arthroplasty (TEA) has been indicated for numerous degenerative inflammatory and traumatic elbow diseases [1–4]. Semiconstrained designs are usually used, allowing a certain degree of valgus/varus of the ulnar component in the hinge mechanism. One of the complications of these TEA at follow-up is wear of the polyethylene bushings in the hinge, and axle failure [5–10]. We report the case of repeated failure of the axle component due to excess valgus in a patient 8 years after initial TEA for nonunion of a supracondylar fracture of the distal humerus and propose treatment.

2. Case report

In 2001, a sedentary 61-year-old, right-handed patient presented with nonunion of a supracondylar fracture of the right distal humerus (Fig. 1). CT scan confirmed nonunion and identified joint space disappearance. TEA was therefore indicated. A hinged prosthesis was chosen to obtain stability of the elbow following resection of the epiphysis of the distal humerus. A Coonrad-Morrey® TEA was used (Zimmer, USA).

Initial surgery was performed on December 11, 2001. A Bryan-Morrey approach was used and the ulnar nerve was isolated. The distal humerus was resected along with associated ligaments and muscles originating in the epicondyle. A 15 cm humeral component with an elongated anterior flange was cemented to the humeral diaphysis. A standard length ulnar component was also cemented and both components were stabilized by a self-locking axle with male and female parts. The collateral ligaments were not repaired. The intact radial head was preserved (Fig. 2).

Postoperative follow-up was uneventful and the patient recovered functional range of motion without pain. Elbow flexion/extension arc of motion included an extension deficit of 45°, to 130° flexion. Rotational range of motion was 160°, 80° pronation and 80° supination. The Mayo Elbow Performance Score was 95 points with a DASH score of 7 points.

The patient underwent a yearly follow-up consultation. In April 2009, severe wear of the polyethylene bushings of the hinge and axle failure was observed [8]. There was no sign of component loosening (Fig. 3). Surgical revision was performed on May 5, 2009. Metallosis was present due to metal-on-metal contact between the components at the hinge (Fig. 4). The male part of the axle had broken and the 4 flanges had fractured, explaining the separation of the male from the female parts. The polyethylene bushings were worn both in the humeral and ulnar components (Fig. 5). Revision included a synovectomy, changing the different polyethylene bushings and placing a new axle in the hinge mechanism.

* Corresponding author.

E-mail addresses: mansat.p@chu-toulouse.fr, pierre.mansat@univ-tlse3.fr (P. Mansat).



Fig. 1. Preoperative X-ray showing supracondylar nonunion with destruction of the joint space.



Fig. 3. At 8 years of follow-up axle failure is noted; the implants are perfectly cemented.



Fig. 2. Postoperative X-ray.

The axle failed again at postoperative month 6. Repeat revision surgery was performed in November 2010, and the male part of the axle was broken in exactly the same manner as the first time with a fracture of the 4 flanges. The polyethylene bushings were only slightly worn. The components were perfectly cemented. A custom made axle was designed by Zimmer, including an axle with a locking system screwed to the outside of the hinge, providing stability of the axle and preventing any detachment (Fig. 6).

The patient was evaluated at a follow-up consultation in January 2014, or 3 years after the second revision surgery. The elbow was stable, there was no pain and there was functional range of motion. The Mayo Elbow Performance Score was 95 points with a DASH score of 25 points. Radiographic assessment showed an intact hinge mechanism and axle, a correctly centered ulnar component and no signs of component loosening 12 years after they were first implanted (Fig. 7).

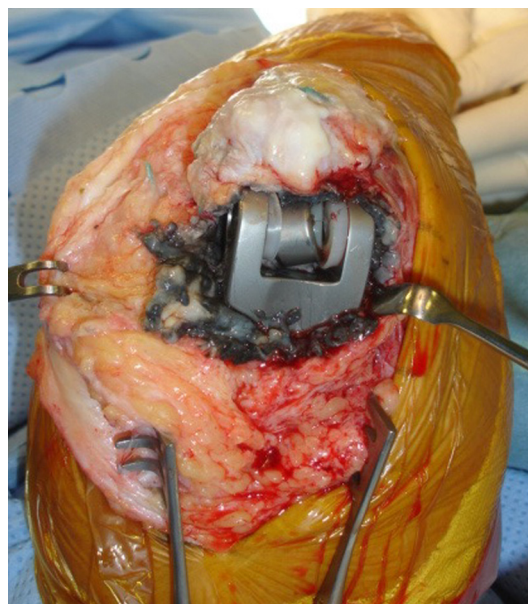


Fig. 4. Perioperative view during revision with metallosis, wear of the polyethylene bushings and metal-on-metal contact between the two implants.

3. Discussion

Linked design total elbow arthroplasties are indicated for many etiologies and studies reporting results with the Coonrad-Morrey prosthesis are the most frequent [4]. This design provides stability of the elbow joint despite bone loss or ligament defects. The semiconstrained design of TEA on the market today limits stress on the component-cement-bone interfaces, but increases stress on the hinge mechanism. Nevertheless, long-term survival of these implants is good and seems to be better than with non-linked designs [4,11–13].

However, wear of the polyethylene bushings has been shown to gradually develop during follow-up, resulting in progressive angulation of the ulnar component in the humeral component which may cause metal-on-metal contact when the polyethylene

Download English Version:

<https://daneshyari.com/en/article/4081421>

Download Persian Version:

<https://daneshyari.com/article/4081421>

[Daneshyari.com](https://daneshyari.com)