Case report

Disassembly of threaded junction between stem extension and femoral component in a total stabilizer revision total knee arthroplasty

Su Chan Lee, Chang Hyun Nam *, Kwang Am Jung, Jung Hoon Lee, Hye Sun Ahn, Ha Young Park

Joint & Arthritis Research, Department of Orthopaedic Surgery, Himchan Hospital, Seoul, Republic of Korea

ARTICLE INFO

Article history:
Received 2 October 2013
Received in revised form 17 December 2013
Accepted 16 January 2014

Keywords:
Revision total knee arthroplasty
Disassembly
Stem-condylar junction

1. Introduction

Frequency of revision TKA tends to increase due to implant worn and damaged, aseptic loosening, infection, and instability [1]. Revision TKA often leads to difficulty in stable fixation of implant owing to osteolysis and bone loss occurring during removal of the implant, and requires more difficult technique than primary TKA because of damaged and imbalanced soft tissue, and the clinical outcome is below the level of primary TKA in many cases [2]. Revision TKA in the presence of poor bone stock can be enhanced by the use of stem extension. But, despite of improvement of fixation, the prosthetic stem–condylar junction becomes a potential area for fatigue failure [3]. Here, we describe an unusual case of disassembly of threaded junction between stem extension and femoral component in a Scorpio® total stabilizer revision total knee system due to loosening of femur component with flexion position.

2. Case report

Eight years ago, a 62-year-old woman underwent primary left total knee arthroplasty for end stage osteoarthritis in our hospital. One year later, she underwent 2-stage reimplantation for infected TKA with antibiotic-load bone cement spacers. After the infection was eradicated, Scorpio® TS (Stryker®, Allendale, NJ, USA) (semi-constrained type) with modular stemmed femoral and tibial components was used by a Scorpio® TS (Stryker®, Allendale, NJ, USA) (semi-constrained type) antibiotic-load bone cement spacers. After the infection was eradicated, later, she underwent 2-stage reimplantation for infected TKA with knee arthroplasty for end stage osteoarthritis in our hospital. One year later aids.

3. Discussion

Methods of revision TKA vary depending upon the cause and surgical findings, and it involves difficulty in surgical technique owing to vulnerability of soft tissue such as the skin, potential infection, and
handling of extensive bone loss, and therefore, it is generally known to result in worse outcome compared to primary TKA [2]. Osteolysis caused by wear and loosening and bone loss occurring upon removal of the implant is a common problem in revision TKA, and it is very important to revise lost bone tissue and maintain joint stability for a successful operation [4]. In order to achieve stability the degree of constraint of the implant, the choice of method for addressing bone loss, the shape of the stem and the stem fixation method are all factors that need to be taken in to consideration.

Current evidence from the literature supports the use of a stem for revision TKA since it offers initial fixation through stress relief, protecting the host bone and graft bone and contributing to the stability of the implant. The fixation method and fixation method and the clinical outcome vary according to length and diameter of the stem and cement used [4–6].

Previous cases in the literature have included five failures occurring at the stem–condylar junction of the total condylar III prosthesis [3], and two failures at the taper lock of Optetrak constrained condylar knee prosthesis have been reported [7]. Also, numerous disengagements of the locking bolt from a modular stem in revision TKA have been reported [3,8,9].

Recently, Nikolopoulos et al. [10] reported one case of fracture at the stem–condylar junction of a modular femoral prosthesis in a varus–valgus constrained total knee arthroplasty (PFC sigma TC3, DePuy Inc., Warsaw, IN).

In our case, the anatomical femorotibial angle was reconstructed in the previous operation, but there was slight flexion of femur implant because we did not use an offset adaptor in the femoral stem. Early aseptic loosening in the distal femur resulting from flexion of femoral
component may lead to fatigue failure of the weakest assembly in the construct. An offset adaptor can be positioned radially, allowing for optimal placement of femoral component about the stem extender relative to the canal.

Disassembly of threaded junction between stem extension and femoral component in revision TKA occurs very rarely, however, once it disengages, it may cause serious complications. The main causes for failure in revision TKA are loosening and osteolysis of the implant, and when it occurs, particularly in modular knee arthroplasty, disengagement at the modular junction can result in implant failure. In this case, it is thought that the femoral component would be flexed and loosening of the bone cement would be promoted, resulting in fatigue failure in modular junction due to no use of the offset adaptor of the femur component despite of the stem used to increase the fixation of femur component. To prevent this, position and fixation of the implant are important, and proper use of the offset adaptor shall be carefully considered to select right positioning of the implant.

4. Conflicts of interests

Each author certifies that he has no commercial associations (consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.

References