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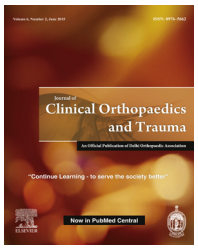

Original Article

Early clinical and radiological results of minimally invasive total hip replacement

Özgür Karakoyun MD[a,*], Mehmet Fatih Erol MD[a], Ahmet Aslan MD[b], Mesut Karıksız MD[a], Burak Günaydın MD[c]

[a] Department of Orthopedics and Traumatology, Namık Kemal University, Tekirdağ, Turkey
[b] Department of Orthopedics and Traumatology, Afyonkarahisar State Hospital, Afyonkarahisar, Turkey
[c] Department of Orthopedics and Traumatology, Kütahya State Hospital, Afyonkarahisar, Turkey

ARTICLE INFO

Article history:
Received 31 December 2015
Accepted 26 March 2016
Available online xxx

Keywords:
Minimally invasive
Total hip replacement
Coxarthrosis

ABSTRACT

Introduction: It is critical to achieve both proper component positioning and intact muscle balance if satisfactory results are to be attained after total hip replacement (THR). There have been fewer studies on minimally invasive (MI) THR than standard approaches. The objective of this paper is to present the early clinical and radiological results of posterolateral MI THR.
Materials and methods: The retrospective analysis of the records of patients undergoing posterolateral MI THR surgery between 2011 and 2014 was the basis of this study. 73 hips of 68 patients were included in the study. The acetabular component and femoral stem positions were measured on plane X-rays. Data on preoperative and postoperative hemoglobin and hematocrit values, as well as transfusion amounts, were also studied. The clinical evaluations were carried out with Harris Hip Scores.
Results: The mean HHS at the 3rd postoperative month was 87.60 (±7.70). Of the 73 cases, 61 were within the Lewinnek safe zone. The mean PMFA was 88.12 (±7.63°), which is within the normal ranges.

The mean postoperative hemoglobin value was 9.7 g/dl (±1.3) and the mean postoperative hematocrit value was 29.8% (±3.8). A nondisplaced proximal femoral fracture line was evident on the early postoperative X-ray of one patient. One patient experienced early dislocation caused by acetabular component malpositioning and an early acetabular cup revision was necessary.
Conclusion: MI posterior approach for THR is a method in which the prosthetic components can be properly placed. Posterolateral MI approaches are safe when THR is performed, and afford satisfactory results.

* *Corresponding author*. Tel.: +90 505 7511978.
E-mail address: ozgurkarakoyun@yahoo.com (Ö. Karakoyun).
http://dx.doi.org/10.1016/j.jcot.2016.03.003
0976-5662/

Please cite this article in press as: Karakoyun Ö, et al. Early clinical and radiological results of minimally invasive total hip replacement, *J Clin Orthop Trauma*. (2016), http://dx.doi.org/10.1016/j.jcot.2016.03.003

1. Introduction

Total hip replacement (THR) is the most common treatment for hip osteoarthritis. The principal purposes of THR are pain relief and provision of a mobile and stable hip, and it is critical to achieve proper component positioning as well as an intact muscle balance. Anterolateral, direct lateral, transtrochanteric, and posterolateral approaches to THR surgery have been described. Recently, anterolateral and posterolateral minimally invasive (MI) approaches have been developed to decrease muscle disruption and blood loss, as well as shorten recovery time. The most important aim of MI surgery is to protect muscular structures and their innervation and vascularization, rather than the use of a small skin incision per se.[1] To decrease the likelihood of component malpositioning, perioperative fractures, and excessive blood loss, new tools and implant designs have been developed.

There have been fewer studies on MI THR than standard approaches. We retrospectively analyzed our MI THR cases and report the early clinical and radiological results in terms of perioperative and early postoperative success, complication rates, and the early postoperative positions of the femoral and acetabular components.

2. Materials and methods

We retrospectively analyzed the records of patients undergoing posterolateral MI THR surgery between 2011 and 2014; 73 hips of 68 patients who were operated by one senior orthopedist with 10 years experience on hip arthroplasty were included in the study. The mean body mass index of the patients was 28.6 kg/cm^2 kg (±3.07). The chief complaint of all patients was hip pain, which was resistant to analgesics. Of these, 44 hips were treated with the Anthology® hip system (Smith and Nephew) and 29 hips were treated with Profemur® Z stems (Wright).

The etiologies were hip dysplasia in 28 patients, femoral head avascular necrosis in 6 patients, and post-traumatic arthritis in 3 patients. The other 31 patients had primary hip joint arthrosis. The mean age of patients was 60.86 (±10.36 years). Of the dysplastic hips, 11 were of Crowe type 1 and 12 were of Crowe type 2; there were no Crowe type 3 or 4 hips in this series.

Data on preoperative and postoperative hemoglobin and hematocrit values, perioperative blood loss amounts, postoperative hemorrhagic drainage amounts, transfusion amounts, and preoperative and postoperative 3-month follow-up Harris Hip Scores (HHS) were obtained from patient records. The anteversion and inclination angles of acetabular components were measured on early postoperative radiograms. The anteversion angles of acetabular cups were calculated using the 'planar anteversion of the acetabular cup' method described by Pradhan.[4] Medial proximal femoral angles (MPFAs) were measured to evaluate femoral stem positions (Fig. 1). In unilateral cases, the distances between the acetabular teardrops and the lesser trochanter evident on standard plain radiograms were used to determine length discrepancies. In addition, early postoperative radiograms were evaluated in terms of fractures or dislocations.

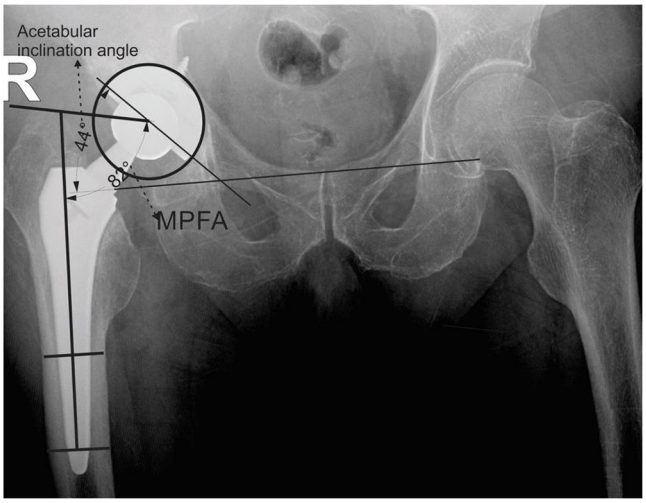

Fig. 1 – Measurement of acetabular inclination and MPFA on plain X-ray.

2.1. Surgical technique

The patient was placed in the lateral decubitus position under anesthesia. A 7–9 cm oblique linear skin incision, running from the posterolateral to the anterolateral side, at an angle of 30° to the coronal plane, was made with the midpoint of the cut lying on the tip of the greater trochanter (Fig. 2). Before cutting the fascia, the skin and subcutaneous fat tissue were widely separated from the fascia to form a mobile skin window. The special instruments designed for the MISTHR are necessary during the operations because the standard retractors are not suitable for this technique. The short external hip rotator muscles were retracted posteriorly, without any tenotomy, to access the proximal part of the posterior joint capsule, which was opened with a J-shaped cut before the hip was dislocated posteriorly. Two over-curved S-shaped Hohmann retractors, which are designed for MITHR, were placed to the femoral neck throughout the interval between short external rotator muscles without any tenotomy before the femoral neck was cut with an

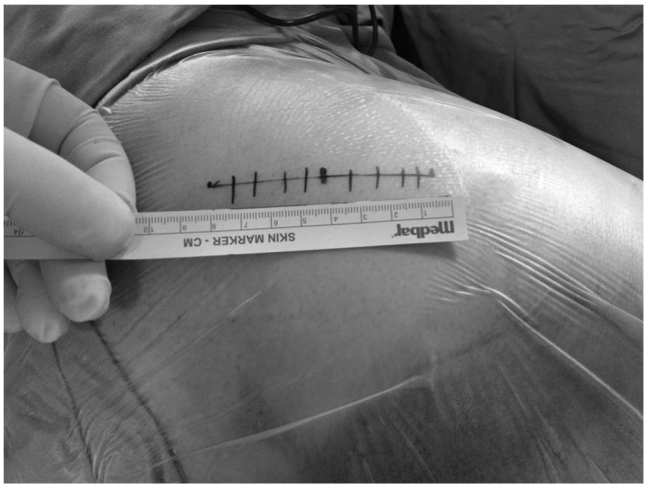

Fig. 2 – The skin incision for MI THR.

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