A Prospective Study of Intraoperative Difficulties in Primary Cementless Total Hip Replacement

Dr. Ali Farouk Hussein, F.I.C.M.S.)

Dep. of Orthopedic /college of medicine/ Al-Nahrain University.

Abstract

Objectives: To assess the pre-operative difficulties in primary cementless total hip arthroplasty.

Patients and Method: A prospective study for 50 total cementless total hip replacements performed in 45 patients from Jan.2010 to Sep. 2011 in orthopedic department in Al-Kadimiya hospital to assess the difficulties encountered during the operation which were classified into femoral, acetabular and soft tissues difficulties.

Results: The indications for surgery were 26% for primary osteoarthritis, 44% for avascular necrosis (primary and secondary to alcohol, steroid or sickle cell disease), 24% due to post traumatic osteoarthritis and 6% due to rheumatoid arthritis. The difficulties encountered during the operation were narrow femoral canal and difficult femoral reaming in 16%, soft tissues contractures and tight capsule in 24% , proximally migrated greater trochanter in 8%,posterior acetabular wall defect in 10% and protrusio acetabulum in 6%, only (10%) were in need for intraoperative blood transfusion.

Conclusion: Extensive pre-operative planning is essential for any hip arthroplasty with the availability of all the range of prosthesis sizes and designs for optimum results.

الخلاصة

الهدف من الدراسة: تقييم الصعوبات التي تواجه تبديل مفصل الورك الكامل الأولي (بدون عجينة) إثناء القيام بالعملية
المرضى و طريقة العمل: دراسة استباقية شملت 45 مريضا (50 عملية تبديل مفصل) أجريت في قسم جراحة العظام و الكسور في مستشفى الكاظمية التعليمي للفترة من كانون الثاني 2010 إلى أيلول 2011 لدراسة الصعوبات إثناء عملية تبديل مفصل الورك الكامل الأولي (بدون عجينة) و قسمت الصعوبات إلى: صعوبات تخص جانب الفخذ, جانب الفنجان و صعوبات تخص الأنسجة الرخوة.
النتائج: اظهرت الدراسة إن سبب التبديل الكامل لمفصل الورك هو سوفا ن أولي (26%) , موات رأس عظم الورك (44%), سوفان ثانوي نتيجة كسر سابق (24%) و التهاب المفاصل الرثوي (6%).
الصعوبات إثناء العملية كانت كالآتي: صعوبات في حفر جانب الفخذ (16%), قصر و تيبس الأنسجة الرخوة والعضلات (24%), زحف عظم الفخذ إلى الأعلى (8%), نقص عظمي للجدار الخلفي للفنجان (8%), غطس الفنجان (10%), والحاجة إلى تعويض الدم إثناء العملية (10%).
التوصيات: لابد من إجراء تحضيرات ودراسة مستفيضة لعمليات تبديل الورك واخذ الرقوق الشعاعية والمفراس ثلاثي الأبعاد مع تحضير الطيف الكامل لكافة أحجام وأنواع مفصل الورك الكامل.

Introduction

Total hip replacement Is a common operation to be performed in Iraq for both primary osteoarthritis and post traumatic osteoarthritis as well as in sickle cell disease ,unlike the western countries the ratio of primary to secondary osteoarthritis is much less than in the eastern countries,[1,2,3].The aim of this study is to evaluate the intraoperative difficulties encountered in total hip replacement in an Iraqi hospital especially that the whole implant sizes and equipments are not always available in the majority of Iraqi hospitals so that we can maximize our preparations for the optimum results.

Unlike the revision hip arthroplasty, the difficulties encountered in primary total hip replacement should be much less, but

in our country there are so many neglected cases of traumatized hips which are badly managed at the time of initial management rendering the later replacement difficult making the difficulties to be encountered in primary replacement coupled with the inavailability of the whole facilities for managing such cases in the majority of Iraqi medical centers.

Patients and Method

We prospectively followed and recorded the intraoperative difficulties while we are performing 50 cementless total hip replacement in 45 patients due to different causes, namely are primary osteoarthritis. post traumatic osteoarthritis, avascular necrosis and sickle cell disease in Al-kadimiya hospital from Jan. 2010 to Sep. 2011 adopting the BICONTACT design by Aesculap.

All the patients had primary total hip replacement performed by the senior author. All patients were conservatively managed with walking aids, analgesics, NSAIDs in the initial management of their hip pain and all patients had failed this conservative treatment protocol. Personal data were collected, patient's age, gender, bone mass index, indication for total hip replacement, the type of hip replacement and any co morbidities.

Operative reports were collected for difficulties encountered during surgery and were classified into: *femoral, acetabular, soft tissue* and *combined difficulties.* Pre-operative X-ray films were reviewed for any anticipated difficulties. 60% of our patients had general anesthesia and 40% had spinal anesthesia`. Patients were placed in lateral position and the surgery was performed through posterolateral approach with standard operative technique for cementless THR. Patients were allowed partial weight bearing for the first six weeks after the surgery. All the patients received DVT thrombo-prophylaxis in form of s.c 4000 I.U low molecular weight heparin. All post traumatic patients underwent a pre-operative three dimensional CT scan to evaluate any acetabular wall defects.

Results

0ut of the (50) cementless total hip replacement performed , 26 % were due to primary osteoarthritis, 44 % were due to avascular necrosis (primary and secondary), 24 % were due to post traumatic osteoarthritis and 6 % due to rheumatoid arthritis as shown in figure (1). The mean age of the patients at time of operation was 52 years (ranging from 21 to 74 years), from the 45 patients there were 25 male and 20 female patients. Arthroplasties were performed in 28 for right and 22 left side. The mean time of surgery was 105 minutes (ranging from 80 to 180 minutes).

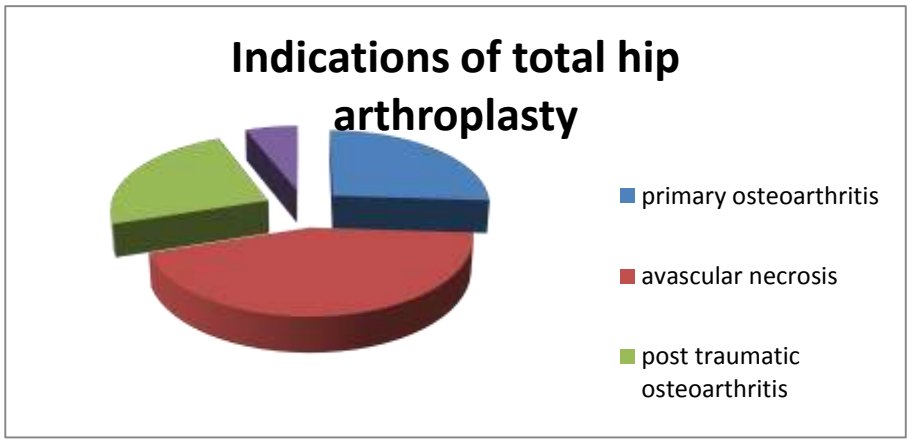

Figure 1. Indications of total hip arthroplasty

Intraoperative difficulties were as follows: narrow femoral canal in 8 (16%), proximally migrated greater trochanter 4 (8%) , soft tissue contracture in 12 (24%) , adductors release was necessary in 2 (4%), posterior acetabular wall defects were observed in 5 (10%) of whom 3 (6%) necessitate reinforcement reconstruction ring and 2 (4%) with bone graft and screw fixation ,protrusio acetabulu in 3 (6%) both with rheumatoid arthritis, Only 5 (10%) necessitate intraoperative blood transfusion as shown in figure (2).In total, the difficulties were encountered in 68% from the operated hips while no significant difficulties regarding the mentioned one encountered in 32% of the operated hips.

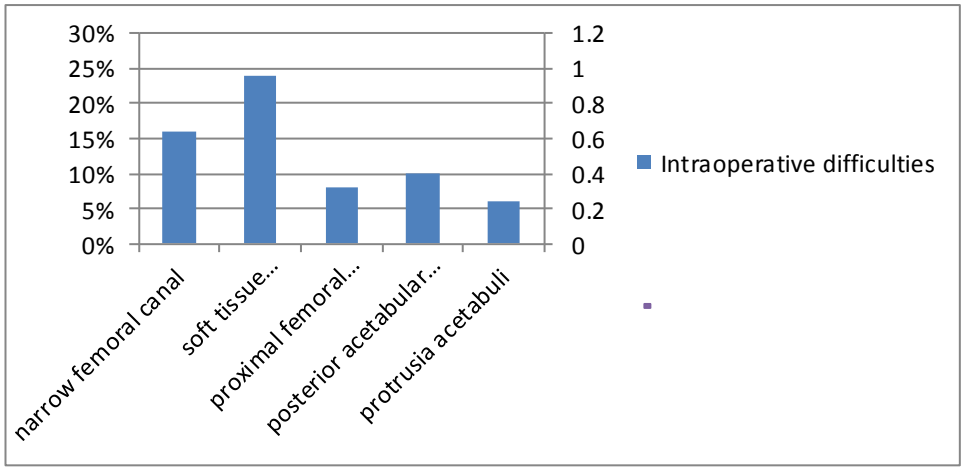

Figure 2. Intraoperative difficulties

Discussion

The main aim for this study is to illustrate the intraoperative difficulties in primary total hip replacement in an Iraqi hospital especially the difficulties related to the unavailability of full spectrum of implants in all Iraqi hospitals. Unlike the majority of western countries where the main indication for hip replacement is primary osteoarthritis [5] , in our study post traumatic osteoarthritis and avascular necrosis were relatively common compared with primary osteoarthritis this result may be attributed to the delay in treatment of the majority of acetabulum and femoral neck fractures and the poor results of treatment of complex hip fractures [5]. Even modern fracture management using improved surgical techniques yields an incidence of post traumatic arthritis approaching 20-30% [6, 7, 8]. Significant pelvic deformity can be a complicating factor but it is usually rare [7]. The overall prognosis for a patient managed with total hip arthroplasty after an acetabular fracture is less favorable than that for one managed with an arthroplasty performed because of primary degenerative arthritis [6,7] . Cortical thickening, sclerosis and narrowing of femoral medullary canal can result in proximal femoral fracture while reaming the medullary canal or inserting femoral prosthesis [1, 9, 10] .narrow femoral canal was found in 16% of our patients compared with 3% in the study of Ottani et al [9], such high incidence may be attributed to the high incidence of post traumatic arthritis in a relatively young patients. Soft tissue contractures where encountered in a relatively high percentage (24%) this may be attributed to the fact that the majority of primary total hip replacement are performed lately and are due to severe old trauma causing severe limb shortening and subsequent soft tissue contractures compared with 6% in the study of Steihl [11].

In conclusion

We advise those who like to perform total hip replacement in Iraqi hospitals to perform extensive preoperative planning of their patients (CT scan is strongly recommended) especially in post-traumatic arthritis ensuring adequate femoral canal size, availability of good reamers and special femoral stems (like developmental dysplastic stem). For the acetabular side, ensure adequate reconstruction plates and bone grafting and the availability of wide variety of cemented and cementless cup sizes in order to tackle the difficulties suggested in our study.

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