Original Article

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Minimal Incision Surgery for Austin Moore Prosthesis in Intracapsular Fracture Neck Femur

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Abstract:

Background- In literature various approaches have been described for hip arthoplasty and although classical Moore's posterior approach provides excellent exposure, the violation of the posterior capsule , pyriformis and external rotators resulted in increased instability, post-operative morbidity. To address this, a modified posterior minimally invasive approach that preserves the short external rotators has been developed . The goals of this study were to compare the efficacy of classical Moore's posterior approach to hip with that of minimally invasive posterior approach to hip that preserves short external rotators.

Methods-30 patients with fracture neck femur were treated with Austin Moore prosthesis and divided into 2 groups: first operated with classical Moore's approach and second operated with small incision surgery . Patients were assessed with respect to different parameters , more specially intraoperative blood loss, duration of surgery , post operative pain and range of motion and Harris Hip score . Results were analyzed and compared between two groups..

Results- Average age of the patients was 67 years. Mean skin incision size was 10.4 cm(range, 8-14 cm) in group 1 and 8.6 cm(range, 6-11 cm) in group 2. Mean operaive time was 58 minutes (range, 48-68minutes) in group 1 and 71 minutes(range, 41-81 minutes) in group 2. Average blood loss (186.66ml) and was significantly less in minimal incision group as compared to classical Moore's incision group (237.66ml). Mean length of hospital stay was 14days (range, 12-23 days) in group 1 and 10 days (range, 10-22 days) in group 2. On follow up, pain was found to be significantly less in the minimal incision group ; and also the range of motion was significantly more in the minimal incision group. Average Harris Hip score in minimal incision group was 80.6 and that in classical Moore's group was 73.93.

Conclusion- Small incision surgery for neck femur is a sound method and had the advantages of less duration of surgery , less blood loss , less post-operative pain and more range of motion than classical Moore's surgery.

Key words: *intracapsular neck fracture, Austin moore prosthesis,*

Introduction

Femur neck fractures are one of the most common fractures of old age [1]. As human life expectancy increases, the incidence of intracapsular femoral neck fractures will likely increase accordingly[1] .Hip joint is a weight bearing joint and has to perform many functions. So a successful treatment of hip fracture should provide a stable and painless hip joint with a near normal range of movements [2].

The precarious proximal femoral blood fixation and prolonged immobilization, and the need for early mobilization make replacement arthoplasty the treatment of choice in fracture neck femur patients[3]. In literature various approaches have been described for hip arthoplasty and although classical Moore's posterior approach provides excellent exposure, the violation of the posterior capsule , pyriformis and external rotators resulted in increased instability, post-operative morbidity [1]. To address this, a modified posterior minimally invasive approach that preserves the short external rotators has been developed [3].

Replacement arthoplasty is either unipolar (Austin Moore prosthesis and Thompson prosthesis), or bipolar (modular and non modular) [3]. The standard incision for arthoplasty is around 12-15cm [4]. At our institute we have studied the results of small incision (7-8cm) surgery for Austin Moore prosthesis and the goals of this study were to compare the efficacy of classical Moore's posterior approach to hip with that of minimally invasive posterior approach to hip that preserves short external rotators.

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Material & Methods

We have studied 35 patients with intracapsular fracture neck femur presenting at our institute during the year 2010 – 2011. All patients were the above the age of 60 years and were operated with Austin Moore prosthesis by our senior author. Patients with pathological

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fractures, nonunions, or failed open reduction and internal fixation were excluded. The study sample included 35 patients , but 5patients were lost to follow-up. Of the remaining 30 patients, 14 underwent AMP hemi-arthroplasty using the classical Moore's posterior approach (group 1) and 16 patients underwent same surgery using minimally invasive posterior approach preserving short external rotators (group 2). Both the groups were matched with respect to age, sex, co-morbidities etc. Pre-operative evaluation was done and patients were operated as early as possible . Only the patients with co-morbidities were operated late due to fitness problems .Mean patient age was 68 years (range, 60-83 years) in group 1 and 67 years (range, 65-86 years) in group 2. 60 % fractures occurred in women and 40% occurred in men. Average follow-up was 24 months (range, 22-36 months). Patients' charts and radiographs were reviewed retrospectively.

The study was approved by the Institutional Review Board of the senior author's institution, and written informed consent was obtained from all patients. Operative time, postoperative blood loss, early post-operative complication rate, dislocation rate, length of hospital stay, and postoperative mortality within 1 year were com-pared between the 2 groups. Numeric variables were tested using the chi-square test or Fisher's exact test. Results were considered significant at P<.05.

Surgical Technique: In minimal incision approach , patient is given a lateral position with injured side uppermost and the incision extends from 7-8 cm on an average .Straight incision rather than curved incision is taken centering on greater trochanter over postero-lateral aspect. Fascia dissected and plane developed between tensor fascia femoris muscle anteriorly and gluteus maximus posteriorly. Pyriformis fossa defined and gluteus medius tendon identified . Pyriformis tendon and joint capsule cut to expose the fracture . Short external rotators are not cut . Entry made from superior aspect of pyriform fossa and canal prepared . Acetabulum is exposed and appropriate size prosthesis is introduced in the canal . Stability of the prosthesis confirmed and limb length discrepancy checked. Capsule not sutured. Deep fascia and tensor fascia lata sutured over suction drain. In the Moore's approach , the procedure is the same except that the incision is about 12-15 cm and that rotators (gemelli and obturator internus) are cut and sciatic nerve is also exposed .

Post operative care included maintaining stable haemodynamics , antero-posterior and lateral radiographs of operated hip and femur , maintaining the operated limb in slight abduction and neutral rotation , quadriceps exercises from day two , drain removal on day three , full weight bearing from day five and suture removal on day ten.

Results

Average age of the patients was 67 years; with the oldest being 86 years and youngest being 60 years . Females were twice as affected as males with trival trauma being the commonest etiology . Average follow up was 24 month with assessment of Harris Hip score on every follow up .Most of the patients were operated with in first week of trauma . Medical problems like hypertension, diabetes, ischemic heart disease , obesity and asthma were common problems. Mean skin incision size was 10.4 cm(range, 8-14 cm) in group 1 and 8.6 cm(range, 6-11 cm) in group 2. Mean operaive time was 58 minutes (range, 48-68minutes) in group 1 and 71 minutes(range, 41-81 minutes) in group 2. Average blood loss (186.66ml) and was significantly less in minimal incision group as compared to classical Moore's incision group (237.66ml).

Table 1: Patient data and clinical results

Parameters	Classical Moore's surgery	Minimal incision surgery	'p' value ('t' test)
No. of patients	14	16	
Age	68	67	
Sex	Females(60%)	Females (60%)	
Co – morbidity	Hypertension (42%)	Hypertension(38%)	
Duration of surgery	71mins.	58mins.	0.0062
Blood loss	237.66ml	186.66ml	0.101
Full weight bearing	8days	5days	
Pain (44)	33.6	39.6	0.337
Range of motion	3.6	4.13	0.0418
Harris Hip score	73.93	80.6	0.302

One patient with a deep infection in group 2 was treated with debridement and retention of the implant with antibiotic-impregnated cement. One patient in group 1 had superfcial wound dehiscence. Mean length of hospital stay was 14days (range, 12-23 days) in group 1 and 10 days (range, 10-22 days) in group 2. No aseptic loosening, heterotrophic ossifcation, protrusio acetabuli, or pulmonary embolism occurred in either group. 2patients in group 1 and 1 patients in group 2 died within 1 year postoperatively (P<.05).

On follow up, pain was found to be significantly less in the minimal incision group ; and also the range of motion was significantly more in the minimal incision group. Average Harris Hip score in minimal incision group was 80.6 and that in classical Moore's group was 73.93.

Figure 1: Oblique and straight 7-8 cm incision was made, centered on tip of greater trochanter.

Figure 2: Deeper dissection showing cut pyriformis & exposed femoral neck between superiorly retracted gluteus medius & inferiorly retracted short external rotators

Figure 3: femoral component was inserted successfully without damaging short external rotators of hip

Discussion

Recent years have seen increasing debate about the role of minimally invasive total hip arthroplasty (THA). Advocates of minimally invasive THA cite faster functional recovery, shorter hospital stays, less pain, better cosmesis, and better patient satisfaction as its appeal [2]. However, critics believe that randomized, comparative studies are needed before the approach should be accepted widely [6]. Although long term results for series using the minimally invasive approach are awaited, recent findings have confirmed the potential benefits of the approach [5].

A modification of the posterolateral approach that preserves the short external rotator muscles and provides excellent exposure of the hip joint [1]. It has several benefits over the conventional posterior approach: it provides increased hip joint stability, allows greater proprioceptive sensation, and requires a smaller incision after THA that preserves the short external rotator muscles [4]. In addition, the procedure requires no additional or special equipment, and the learning curve for THA is small [4].

At our institute , we have been doing Austin Moore's prosthesis in old patients on a regular basis. Since last 3 years we have started using a minimal incision approach for Austin Moore prosthesis and studied its results in comparison to Classical Moore's approach.

In this procedure special retractors are not required ; only deep right angled retractors are used . The rotators are not cut, only the pyriformis tendon is cut and if required glutemus minimus tendon is cut for exposure . This reduces the chances of posterior dislocation of prosthesis . Also less dissection leads to a lesser blood loss. The prosthesis is inserted from the superior aspect of pyriformis fossa and neck from where the canal is directly visible . This reduces the chances of varus placement of prosthesis and complication like medial thigh and knee pain

Conclusion:

1.Small incision surgery is a sound method for fracture neck femur.

2.It decreases the duration of surgery and blood loss during surgery .

3.It reduces post operative pain and increases the range of motion allowing patient early mobilization and weight bearing.

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