ORIGINAL ARTICLE

Clinical outcome of cemented bipolar hemiarthoplasty versus Austin Moore hemiarthroplasty for displaced intracapsular fractures of hip in terms of anterior thigh pain in elderly

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Abstract

Objective: To explore a less pain-inciting implant in terms of anterior thigh pain after hip hemi-arthroplasty in displaced intra-capsular fractures of the neck of femur.

Methods: The cross-sectional comparative study was conducted at the Combined Military Hospital, Rawalpindi, from November 2013 to June 2014, and comprised patients of either genders with age above 55 years and having displaced intra-capsular fractures of the neck of femur. The patients were divided into two equal groups, with Group A patients undergoing Austin Moore hemi-arthoplasty and Group B having cemented bipolar hemi-arthoplasty. Follow-up was done at 4, 8 and 12 weeks postoperatively for anterior thigh pain on the basis of visual analogue scale. Mean pain scores for both groups were calculated and compared.

Results: There were 60 patients; 30(50%) in each group. The mean age in Group A was 78.40±6.95 years, while in Group B it was 77.16±6.32. The overall male-to-female ratio was 1.8:1. All patients had uneventful postoperative recovery. Mean anterior thigh pain in Group A was statistically higher than Group B ($p<0.05$).

Conclusion: Compared to Austin Moore hemi-arthoplasty, cemented bipolar hemi-arthoplasty caused significantly lower incidence of anterior thigh pain.

Keywords: Hip fractures, Intra-capsular, Hemi-arthoplasty, Austin Moore, Bipolar, Thigh pain. (JPMA 65: S-49 (Suppl. 3); 2015)

Introduction

Displaced intra-capsular femoral neck fractures are common injuries in elderly people.[1] The rate of hip fractures almost doubles after the age of 60 years.[2] Osteoporosis is the most common predisposing factor for these types of fractures, although osteomalacia, diabetes, alcoholism and other conditions associated with osteopaenia may also lead to such fractures.[3] Intra-capsular fracture of neck of femur is classified by Arbeitsgemeinschaft für Osteosynthesefragen (AO) or Garden's classification.[4] Majority of these elderly patients are treated with hemi-arthoplasty.[5] The most common implant in use in our part of the world for this purpose is Austin Moore[6] with a design more than 50 years old. Anterior thigh pain in cases treated with Austin Moore appeared to be related to prosthesis loosening within the femoral canal.[7] Cementation techniques have been associated with reduced post-operative pain and improved range of motion (ROM), presumably due to immediate and secure implant fixation.[8]

A large number of studies are available comparing cemented and un-cemented hemi-arthoplasties for displaced intra-capsular fractures of the neck of femur. In our setup, we have been using Austin Moore prosthesis for such fractures in elderly patients. But we usually faced complaints of anterior thigh pain leading to decreased mobility, increased usage of nonsteroidal anti-inflammatory drugs (NSAIDs) and dependency on attendants.

The current study was planned to help in selecting and offering to elderly patients better implant in terms of less anterior thigh pain in cases of displaced intra-capsular hip fracture.

Patients and Methods

The comparative cross-sectional study was conducted at the Orthopaedic Department of Combined Military Hospital (CMH), Rawalpindi, from November 2013 to June 2014, and comprised patients above the age of 55 years with displaced intra-capsular fractures of the neck of femur (Garden III/IV). Those below 55 years or with undisplaced intra-capsular fracture of the neck of femur (Garden I/II), pathological fractures of proximal femur and those with severe arthritic changes of acetabulum were excluded. The patients were randomly assigned to two equal groups, with Group A undergoing Austin Moore hemi-arthoplasty, and Group B having cemented bipolar hemi-arthoplasty. After informed consent was obtained from all the patients,

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the patients were divided into groups. All operations were performed or supervised by two orthopaedic surgeons. The approach was lateral with repair of joint capsule. Bipolar implant (Tipmed, Turkey) was inserted after reaming and irrigation of femoral canal followed by cement induction. Bone cement with gentamicin (Cemexisoplastic, Tecres Medical, Italy) was used. All patients received peri-operative antibiotic prophylaxis (Injection Augmentin 1 gram intravenously [IV] q8 hourly combined with Injection Amikacin 500mg IV bi-daily [BD]). At the time of admission the patients were given thrombo-embolic deterrent stockings with injection clexane 40mg subcutaneously once a day. Injection clexane was stopped 12 hours before surgery. After surgery, all patients were mobilised the next day, with the advice to bear full weight and hesitate to adduct full, the operated hip to opposite side. They were discharged on either 3rd or 4th post-operative day. Stitches were removed two weeks post-operatively. Patients were followed up monthly subsequently and visual analogue scale (VAS) score for pain was counted for 3 months.

Results

There were 60 patients; 30(50%) in each group. The mean age in Group A was 78.40±6.95 years, while in Group B it was 77.16±6.32. The overall male-to-female ratio was 1.8:1. All patients had uneventful postoperative recovery. After a regular follow-up at 4, 8 and 12 weeks, mean pain score was calculated independently for both groups. It turned out to be 2.56±0.53 in Group A and 0.533±0.97 in Group B at the end of 4 weeks (p=0.001). By the end of 8 weeks, it became 2.10±2.27 and 0.60±1.73 (p=0.002). Eventually at the end of 12 weeks, the values were 3.53±3.61 and 0.80±2.34 (p=0.003) (Table).

Table: Group comparison on the basis of visual analogue scale (VAS) score.

Variable	Austin More Group (n = 30) Group A	Cemented Bipolar Group (n =30) Group B	P value
Age (years)	78.40±6.95	77.16±6.32	0.519
Visual analogue score at 4 weeks	2.56±0.53 (2.50±3.00)	0.533±0.97 (0.00±1.00)	< 0.0001
Visual analogue score at 8 weeks	2.10±2.27 (1.00±4.25)	0.60±1.73 (0.00±0.00)	0.002
Visual analogue score at 12 weeks	3.53±3.61 (3.00±7.00)	0.80±2.34 (0.00±0.00)	0.003

Discussion

Fracture of the neck of femur in elderly patients has become a serious problem, especially with the ongoing trend of global aging and osteoporosis due to changing lifestyles. Hemi-arthroplasty is an affective option in helping the patients resume their walking abilities as soon as possible with reduction in the risk of respiratory and urinary tract infections and deep vein thrombosis (DVT). However, anterior thigh pain is the most common complaint witnessed in orthopaedic out-patient department (OPD) during the follow-up visits of hemi-arthoplasty patients. In our setting, it is observed that residual anterior thigh pain adversely affects the mobility of patients, thus rendering them to inadvertent use of NSAIDs and their associated complications. Anterior thigh pain also has detrimental effects on patient's morale which leads to dissatisfaction and psychosocial issues in terms of increased dependency on their attendants. All these considerations lead us to the use of cemented bipolar prosthesis as a changing trend in cases of displaced intra-capsular fractures of the neck of femur where we previously did Austin Moore prosthesis.

Literature review has revealed a number of studies conducted in cases of displaced fractures of the neck of femur comparing different types of implants in terms of cementation or otherwise. In 1982, Sonne-Holm et al. compared results of cemented and un-cemented hemi-arthoplasty in 112 patients. Patients treated with cemented implants had better walking ability and less residual pain.[9] A similar finding was witnessed in a relatively smaller sample of 50 patients, but in this study implant used was cemented and non-cemented bipolar type. Patients with cemented implants had better functional outcome in terms of residual thigh pain.[10] However, Santini et al. took a sample of 116 patients and subjected them to cemented and non-cemented bipolar hemi-arthoplasties but did not find any statistically significant difference between the two groups.[11]

Cochrane review on this subject also showed that cementing prosthesis in place is likely to reduce the amount of residual pain and allows better mobility.[12] Two studies comprising 190 patients compared a cemented and un-cemented Thompson prosthesis. A significant rise in residual pain was noted in the un-cemented prosthesis group.[13]

Parker et al. conducted a randomised controlled trial in 400 patients of displaced intra-capsular hip fractures to

determine difference between cemented Thompson hemi-arthoplasty and un-cemented Austin Moore prosthesis. The degree of residual pain was less in those treated with a cemented prosthesis ($p<0.0001$) three months after surgery.[8] Paradoxically, Taylor et al. published a double-blind randomised controlled trial with 24 months of follow-up in a sample size of 160 patients. It did not show any difference in residual thigh pain in either cemented or un-cemented hemi-arthoplasty groups.[14] A meta-analysis comprising 7 randomised controlled trials (RCTs) and 1,125 patient, revealed lower residual pain ($p<0.001$) in cases of cemented hemi-arthoplasty.[15] In another meta-analysis consisting of 8 trials and 1,175 patients showed that incidence of residual pain after one year of operation was 23.6% in cases of cemented hemi-arthoplasties and 34.4% in cases of un-cemented hemi-arthoplasties. This indicated lesser incidence of residual pain, thus leading to better functional outcome in cases of cemented hemi-arthoplasties.[16]

In our study, the group of patients treated with cemented bipolar prosthesis had lower pain scores, signifying less pain on account of VAS at 4 weeks, 8 weeks and 12 weeks. At the end of 12 weeks of follow-up, the cemented group had mean degree of residual pain of 0.80, whereas the Austin Moore group had mean degree of residual pain of 3.53, rendering it statistically significant with <0.05.

Conclusion

With a limited sample size, the study found that cemented bipolar hemi-arthoplasty led to less anterior thigh pain compared to Austin Moore prosthesis. No cement-related complications were witnessed.

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