International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

A Study Determine the Functional Score – Harris Hip Score in Operated Cases of Fracture Neck Femur using Conventional Cannulated Hip Screws (CCS) Vs Bone Impregnated Hip Screws (BHS):

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Abstract: ***In treating fracture neck of femur Cannulated cancellous screws are the gold standard ideally using three screws. Some surgeons replace one of the screws with fibular strut graft to stimulate the bone growth. There is only one report of use of cancellous graft in fracture neck of Femur (Samuelson), and the failure rate is reported as 22%. Present understanding of the biomechanical principles employee three screws, each assigned a particular area of the neck of femur and this assumes an inverted triangular configuration. This study uses an innovative implant, Bone impregnated hip screw (BIHS), which combines the biomechanical properties of the standard cancellous hip screws and as well as providing provision for placing cancellous bone graft within the body of the screw . The disadvantage of the study is the small sample size and the wide variations in the ages of patients. This study puts in a sincere effort to study the functional score – Harris Hip Score in operated cases of fracture neck femur using conventional cannulated hip screws (ccs) vs bone impregnated hip screws (bhs) so as to find which ones usage has a better outcome.***

Keywords: Conventional Cannulated hip Screws (Ccs), Bone impregnated Hip Screws (BHS), Hariis Hip Score

1. Introduction

The history of management of femoral neck fractures parallels with the history of modern Orthopaedics Surgery. Hip fractures are common and comprise 20% of the operative workload of an orthopaedic trauma unit[1]. Intracapsular femoral neck fractures account for 50% of all hip fractures. The lifetime risk of sustaining a hip fracture is high and lies within the range of 40% to 50% in women and 13% to 22% in men. Life expectancy is increasing worlwide, and these demographic changes can be expected to cause the number of hip fractures occuring worldwide to increase from 1.66 million in 1990 to 6.26 million in 2050[2].

Femoral neck fractures are most frequently in elderly female patients. They are uncommon in patients younger than 50 years. There is some racial variation in the incidence. They are less common in black races[3] and more common in black females than in males[4]. Currently, these fractures are most common in the white populations of Europe and North America[5]. Incidence increases exponentially with age[6]. The risk of a second hip fracture within 2 years approaches 10% in women and 5% in men[7,8]. In patients who sustain a second hip fracture, it is the same type of hip fracture in over 70%[9].

In treating fracture neck of femur Cannulated cancellous screws are the gold standard ideally using three screws. Some surgeons replace one of the screws with fibular strut graft to stimulate the bone growth. There is only one report of use of cancellous graft in fracture neck of Femur (Samuelson), and the failure rate is reported as 22%[10]. Present understanding of the biomechanical principles employee three screws, each assigned a particular area of the neck of femur and this assumes an inverted triangular configuration.

Since, each of the screws has a particular function to perform if one of the screw is replaced by fibular graft, the function assigned to that particular screw will be lost and the fracture tends to displace lately leading to delayed union and avascular necrosis.

This study uses an innovative implant, Bone impregnated hip screw (BIHS), which combines the biomechanical properties of the standard cancellous hip screws and as well as providing provision for placing cancellous bone graft within the body of the screw . The disadvantage of the study is the small sample size and the wide variations in the ages of patients.

This study puts in a sincere effort to study the functional score – Harris Hip Score in operated cases of fracture neck femur using conventional cannulated hip screws (ccs) vs bone impregnated hip screws (bhs) so as to find which ones usage has a better outcome.

2. Aims and Objectives

To study the functional score – Harris Hip Score in operated cases of fracture neck femur using conventional cannulated hip screws (ccs) vs bone impregnated hip screws (bhs).

3. Materials and Methods

Study Design

Research Approach: Quantitative Study

Research Design: Analytical
Study Setting: ……
Study Population: Patients who have sustained an intra-capsular femoral neck fracture admitted in ……. Medical College from August 2014 to August 2016 were taken for this study after taking their consent.
Sampling: Simple Random Sampling
Sample Size has been found to be 12 for each group and hence total of 24 patients are required.

4. Results

Twenty four cases were operated of both Canulated Cancellous Screws and Bone Impregnated Hip screws, two cases were lost follow up one from each group and two cases had complications one from each group. Age of patient ranged from 50 years to 60 years.

Table 1: Harris Hip Score in CCS and BIHS.

HARRIS HIP SCORE	CCS	BIHS
EXCELLENT (90-100)	5	4
GOOD (80-89)	4	5
FAIR (70-79)	0	0
POOR (<70)	2	2

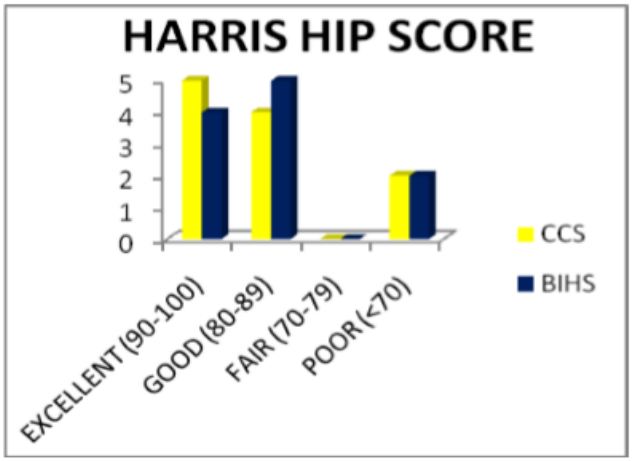

Image 1: Harris Hip Score in CCS and BIHS.

It was found in the study that five patients (45.4 %) from Cancellous group and four (36.4 %) patients from BIHS group had excellent Harris Hip Score, four patients (36.4 %) from cancellous group and five patients (45.4 %) from BIHS group had good Harris Hip Score, none had fair hip score and two (18.2 %) from each Cancellous group and BIHS group had poor Harris Hip Score. The mean Harris Hip Score at 3 months is 1.02, mean Harris Hip Score at 6 months is 2.33 and mean Harris Hip Score at 1 year is 2.64.

Independent Samples Mann Whitney U Test shows p value of > 0.05. It denotes that there is no significant difference between the two groups based on Harris Hip Score taken at 3 months (p value = 1), 6 months (p value = 0.973) and 1 year (p value = 0.973) of follow up.

Image 2: Pre and Post - operative X rays

5. Discussion

In this series, there were 9 patients with excellent Harris Hip Score (5 in CCS and 4 in BIHS), 9 patients with good Harris Hip Score (4 in CCS and 5 in BIHS), none showed fair results according to Harris Hip Score and 4 had poor results (2 in CCS and 2 in BIHS).

PK Sundara Raj et al[11], in their prospective study of treating fracture neck of femur with Cannulated Cancellous Screw (CCS) and Bone Impregnated Hip Screw (BIHS) in elderly, included 59 patients with excellent Harris Hip Score (18 in CCS and 41 in BIHS), 15 patients with fair Harris Hip Score (13 in CCS and 2 in BIHS), none showed good results according to Harris Hip Score and 4 had poor results (3 in CCS and 1 in BIHS).

Though fractures of femoral neck are now better understood and the methods of treatment have improved, non-union and screw breakage of the femoral head are still serious problems. We had one case of Screw Breakage (4 %) in BIHS group treated with Total Hip Replacement and one case of Non - union (4 %) treated with Muscle Pedicle Grafting. Bonnaire FA et al[12] in analysis of fracture gap changes, dynamic and static stability of different osteosynthetic procedures in the femoral neck found screw breakage to be a possible complication which can be corrected with Total Hip Arthroplasty.

Garden RS et al[13] malreduction and avascular necrosis in subcapital fractures of the femur states about the number of non - union which is found to be 83 out of 500 cases (16.6 %) for which inter trochanteric osteotomy was done. The case of non - union was reported with CCS Screw in present study was treated with quadratus femoris muscle pedicle

graft (MPG) as adjunctive treatment as described by Johnson KD et al in J Orthop Trauma Journal 1989[14].

6. Conclusion

No significant difference was noted between the two groups on long term follow up with respect to pain, mobility and stability as assessed by Harris Hip Score at 3 months, 6 months and 1 year. The complication we encountered was one case of Non union in Cancellous Group and one case of Implant Breakage in BIHS Group both being Garden's Type IV which is in par with the complication rates in standard literatures.

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