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Comparison of Total hip arthoplasty and DHS with Bone graft for Neck of femur fractures in terms of mobility and patient satisfaction.

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Abstract

Background

Femur neck fractures are a common orthopedic injury that can cause serious morbidity, especially in older people. Although Total Hip Arthroplasty (THA) and Dynamic Hip Screw (DHS) with bone grafting are common therapeutic choices, the best surgical care is still debatable. The purpose of this study was to examine the postoperative mobility and patient satisfaction of these two modalities.

Objective

To assess and contrast the results of Dynamic Hip Screw with bone grafting and Total Hip Arthroplasty in patients with femur neck fractures, with an emphasis on patient satisfaction and mobility.

Methodology

Over the course of a year, 80 patients with femur neck fractures participated in this prospective observational study. Patients were split into two groups: Group B (n = 40) received Dynamic Hip Screw with bone grafting, while Group A (n = 40) had Total Hip Arthroplasty. At six weeks, three months, and six months, patients were monitored. The Harris Hip Score was used to

measure mobility, and a standardized questionnaire was used to gauge patient satisfaction. Appropriate tests were used for statistical analysis, and a p-value of less than 0.05 was deemed significant.

Results

The THA group had a considerably higher mean Harris Hip Score (88.5 ± 6.3) than the DHS group (78.2 ± 8.7) ($p < 0.05$). In contrast to 60% of patients in the DHS group, 80% of patients in the THA group showed excellent to good mobility outcomes. Compared to 35% in the DHS group, a larger percentage of patients in the THA group (60%) expressed high levels of satisfaction. Complications include non-union (12.5%), avascular necrosis (10%), and implant failure (15%) were more common in DHS with bone grafting than in THA, which had a reduced complication rate but a slight risk of dislocation (7.5%).

Conclusion

When treating femur neck fractures, total hip arthroplasty yields better functional results and more patient satisfaction than dynamic hip screws with bone grafting. While DHS with bone grafting is still an option for certain younger individuals, it is advised as the ideal treatment, especially for older patients.

Keywords

Femoral neck fracture; Total Hip Arthroplasty; Dynamic Hip Screw; Bone grafting; Mobility; Harris Hip Score; Patient satisfaction; Orthopedic surgery

Introduction

One of the biggest problems in orthopaedic practice is femoral neck fractures, especially in older patients. Globally, these fractures are linked to significant rates of morbidity, mortality, and socioeconomic impact. An estimated 1.6 million hip fractures occur each year; by 2050, this number is expected to rise to almost 6 million instances due to aging populations and longer life expectancies. Among these injuries, intracapsular fractures of the femoral neck are especially troublesome due to their impaired blood supply, which puts patients at risk for consequences such avascular necrosis and non-union.

The treatment of femoral neck fractures is still debatable, particularly when it comes to the decision between joint replacement and joint preservation. Early mobilization, function restoration, pain alleviation, and the reduction of complications are the main objectives of treatment. Total Hip Arthroplasty (THA) and internal fixation with Dynamic Hip Screw (DHS),

frequently supplemented with bone grafting, are two commonly used surgical techniques. The best course of treatment is still up for debate, and each approach has its own indications, benefits, and drawbacks.

In older, active patients with displaced femur neck fractures, total hip arthroplasty has become more common. THA eliminates the concerns of femoral head ischemia by replacing both the acetabular component and the femoral head. When compared to alternative treatment techniques, THA offers better functional outcomes, increased range of motion, and a higher quality of life, according to numerous studies. THA was linked to superior functional results, decreased revision rates, and greater quality of life, according to a recent comprehensive study covering nearly 30,000 patients; nevertheless, operative time was longer than with alternative surgeries. Additionally, THA has been associated with increased mobility, which is important for lowering postoperative sequelae such pressure ulcers, pulmonary embolism, and deep vein thrombosis.

On the other hand, internal fixation with DHS is still often used, especially for younger patients and fractures that are either undisplaced or only slightly displaced. By offering secure fixation that promotes fracture healing, DHS fixation seeks to maintain the natural femoral head. It has been suggested that adding bone grafting will increase structural support, promote biological healing, and lower the chance of non-union. This strategy is particularly important in areas with little resources, where joint replacement might not be easily available or reasonably priced.

Despite its benefits, DHS fixation has a number of drawbacks, such as avascular necrosis, non-union, and fixation failure. Reoperation is frequently required due to these problems, which can negatively impact patient results and satisfaction. According to studies, internal fixation failure rates for displaced femoral neck fractures can reach 20–40%, especially in older patients with low bone quality. As a result, arthroplasty has gradually become more common in these situations.

Two crucial outcome metrics are especially significant when comparing THA and DHS with bone grafting: patient satisfaction and postoperative mobility. A key factor in determining both long-term independence and total rehabilitation is mobility. It has been demonstrated that early mobilization lowers hospital stays, minimizes complications, and increases survival rates. Research indicates that patients receiving THA typically had higher mobility ratings than those receiving internal fixation, most likely as a result of the rapid stability and lack of fracture healing reliance.

Another important metric that shows the overall effectiveness of treatment from the viewpoint of the patient is patient satisfaction. It includes quality of life, return to daily activities, functional abilities, and pain relief. Because THA improves joint function and reduces discomfort, it has been linked to superior patient-reported results. But there are risks involved as well, like infection, dislocation, and a prolonged recovery period. DHS with bone grafting, on the other hand, maintains the native joint, which would be better for younger people, but the possibility of problems could lower satisfaction.

Numerous criteria, including as patient age, activity level, bone quality, fracture displacement, comorbidities, and economical considerations, affect the decision between these two treatment approaches. DHS with bone grafting is a feasible alternative for younger patients because joint preservation is still a top objective. On the other hand, because of its predictable results and lower reoperation rates, THA is frequently preferred in elderly patients with limited healing ability.

The healthcare environment is another crucial factor, especially in underdeveloped nations where treatment choices may be impacted by resource constraints. When compared to THA, DHS with bone grafting is frequently more economical and technically simpler, making it a popular choice in these situations. But these early benefits might be outweighed by the possibility of revision surgery.

Comparative studies comparing the results of THA against DHS with bone grafting are crucial given the continuous controversy and lack of agreement in the literature. There is comparatively little information directly comparing THA with DHS supplemented by bone graft; instead, the majority of current research has concentrated on comparisons between THA and hemiarthroplasty. Consequently, more investigation is required to offer evidence-based recommendations for clinical decision-making.

With an emphasis on postoperative mobility and patient satisfaction, this study compares Total Hip Arthroplasty and Dynamic Hip Screw with bone grafting in the treatment of femur neck fractures. By assessing these results, the study aims to identify the best course of action for treating patients with femur neck fractures in order to improve their quality of life and functional rehabilitation.

Methodology

Over the course of a year, this comparative study was carried out in the orthopaedic surgery department of a tertiary care hospital. The study was created as a prospective observational study to assess the results of patients with femur neck fractures treated with either Dynamic Hip Screw (DHS) with bone grafting or Total Hip Arthroplasty (THA). After receiving informed consent, 80 patients in all were added to the research. Patients were split into two groups: Group B consisted of patients treated with Dynamic Hip Screw fixation enhanced with bone transplant, whereas Group A consisted of patients who had Total Hip Arthroplasty.

Patients between the ages of 40 and 80 who presented with intracapsular femur neck fractures (both displaced and undisplaced) and were surgically fit met the inclusion criteria. The study excluded patients who had severe osteoarthritis, polytrauma, pathological fractures, prior hip surgery, or were medically unfit for anesthesia. Every patient got a comprehensive clinical and radiological evaluation, including X-rays of the pelvis and both hips, after being admitted via the emergency or outpatient department. The Garden categorization system was used to categorize fractures. All patients underwent preoperative optimization, including concomitant condition management.

Under spinal or general anesthesia, patients in Group A received total hip replacement utilizing a typical posterior or lateral surgical technique. Standard postoperative procedures, such as early mobilization, were adhered to, and an appropriate prosthesis size was chosen intraoperatively. Patients in Group B had autologous cancellous bone grafting from the iliac crest in addition to internal fixation using Dynamic Hip Screw. Prior to fixation, appropriate fracture reduction was accomplished under fluoroscopic guidance.All patients got conventional postoperative care, which included physiotherapy, thromboprophylaxis, and antibiotics. As tolerated, early mobilization was encouraged. Following surgery, patients were monitored for six weeks, three months, and six months.

Mobility and patient satisfaction were among the outcome indicators. The Harris Hip Score (HHS) was used to measure mobility, and a standardized questionnaire based on pain alleviation, capacity to carry out daily tasks, and general procedure satisfaction was used to gauge patient satisfaction. Statistical software was used for data collection and analysis. Qualitative factors were displayed as percentages and frequencies, whereas quantitative values were given as mean ± standard deviation. The two groups' results were compared using the independent t-test and chi-square test; a p-value of less than 0.05 was deemed statistically significant.

Results

The trial comprised 80 patients in total, 40 in each group. Group B received Dynamic Hip Screw (DHS) treatment with bone grafting, while Group A received Total Hip Arthroplasty (THA). The results were examined in terms of patient satisfaction, mobility (as measured by the Harris Hip Score), and demographic distribution.

Table 1: Demographic Characteristics of Patients

Variable	Group A (THA) (n=40)	Group B (DHS + Bone Graft) (n=40)
Mean Age (years)	65.4 ± 8.2	58.7 ± 9.5
Gender (Male/Female)	22 / 18	24 / 16
Fracture Type (Displaced/Undisplaced)	30 / 10	28 / 12

Interpretation: Compared to the DHS group, patients in the THA group were comparatively older. The groups' fracture types and gender distribution were similar.

Table 2: Comparison of Mobility (Harris Hip Score) at 6 Months

Outcome (HHS Category)	Group A (THA)	Group B (DHS + Bone Graft)
Excellent (90–100)	20 (50%)	10 (25%)
Good (80–89)	12 (30%)	14 (35%)
Fair (70–79)	6 (15%)	10 (25%)
Poor (<70)	2 (5%)	6 (15%)
Mean HHS Score	**88.5 ± 6.3**	**78.2 ± 8.7**
p-value	**<0.05**	

Interpretation: Compared to patients treated with DHS and bone grafting, patients treated with THA showed noticeably superior mobility outcomes.

Table 3: Patient Satisfaction at 6 Months

Satisfaction Level	Group A (THA)	Group B (DHS + Bone Graft)

Satisfaction Level	Group A (THA)	Group B (DHS + Bone Graft)
Highly Satisfied	24 (60%)	14 (35%)
Moderately Satisfied	12 (30%)	16 (40%)
Not Satisfied	4 (10%)	10 (25%)
p-value	**<0.05**	

Interpretation: Compared to the DHS group, a notably greater percentage of patients in the THA group expressed good satisfaction.

Table 4: Postoperative Complications

Complications	Group A (THA)	Group B (DHS + Bone Graft)
Infection	2 (5%)	3 (7.5%)
Dislocation	3 (7.5%)	0 (0%)
Non-union	0 (0%)	5 (12.5%)
Avascular Necrosis	0 (0%)	4 (10%)
Implant Failure	1 (2.5%)	6 (15%)

Interpretation: THA was linked to a minor risk of dislocation, while DHS with bone grafting shown greater rates of complications like non-union, avascular necrosis, and implant failure.

Conclusion

In terms of postoperative mobility and patient satisfaction, this study showed that Total Hip Arthroplasty (THA) is a better therapeutic option than Dynamic Hip Screw (DHS) with bone grafting for femur neck fractures. Significantly higher Harris Hip Scores were attained by THA patients, suggesting improved functional recovery and a faster return to daily activities. Furthermore, a higher percentage of patients in the THA group expressed high levels of satisfaction, mostly as a result of better joint function and pain alleviation.

Compared to DHS with bone grafting, THA had a decreased overall complication rate, despite a little risk of problems like dislocation. On the other hand, non-union, avascular necrosis, and implant failure were more common in DHS fixation, which had a detrimental effect on patient satisfaction and mobility and frequently necessitated additional surgical intervention. These results suggest that THA is the best course of treatment, especially for older patients with displaced femur neck fractures, where quick mobilization and reliable results are crucial.
However, in younger patients when it is preferred to preserve the original hip joint, DHS with bone grafting may still be taken into consideration. In conclusion, while careful patient selection is still important, total hip arthroplasty is often a more effective treatment choice due to its more consistent functional outcomes and higher patient satisfaction.

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