

**To Find the Functional Outcome of Short Stem in Total Hip Arthroplasty by Using Modified Harris Hip Scoring**

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**Abstract**

**Background:** Total hip arthroplasty (THA) is a common orthopaedic procedure. For patients with hip pain due to a variety of conditions, THA can relieve pain, can restore function, and can improve quality of life.

**Methods:** This study included both prospective and retrospective cases, which was conducted in the Department of Orthopaedic Surgery, Indira Gandhi Medical college, Shimla. Patients operated in past with short stem were included in the study as retrospective cases. Informed consent obtained from every patients prior to commencement of the study.

**Results:** On final follow up total hip score was excellent in 80 % cases and good in 16 % cases and fair in 4% cases while pre- operative score was poor in all cases. Average pre op Harris hip score was 19.75, and on last follow up average harris hip score was 91.66. There was statistically significant change of pre operative score to last follow up score with p- value < .001

**Conclusion:** Modified Harris hip score has improved on an average from preoperative score of 20 to postoperative score of 92.

**Keywords:** Modified Harris hip score, THA. Post – operative.

**Introduction**

The hip is a true ball-and-socket joint surrounded by powerful and well-balanced muscles, enabling a wide range of motion in several physical planes while also exhibiting remarkable stability. As the structural link between the lower extremities and the axial skeleton, the hips not only transmit forces from the ground up but also carry forces from the trunk, head and neck, and upper extremities. The structure of hip joint particularly liable to mechanical derangement and once the bones composing it have become distorted, joint function is likely to be compromised.<sup>1</sup>

Total hip arthroplasty using a short-stem prosthesis preserves more bone stock for any future revision, particularly in young and active patients who have a longer life expectancy and higher levels of activity and thus are more likely to undergo revision. Other advantages include less thigh pain and ease of use in

minimally invasive surgery because of the more medial entry point of the stem in the femoral neck. Restoration of the femoral offset improves hip abductor strength and range of motion and decreases limping, dislocation risk, cup strain and polyethylene wear. Improved hip biomechanics and minimising limb length discrepancy improves patient's satisfaction, gait, back pain & ultimately leads to improved functional outcomes.<sup>2</sup>

### Material and Methods

**Study background:** This study included both prospective and retrospective cases, which was conducted in the Department of Orthopaedic Surgery, Indira Gandhi Medical College, Shimla. Patients operated in past with short stem were included in the study as retrospective cases. Informed consent obtained from every patient prior to commencement of the study.

**Study Subject:** All the subjects who fulfill inclusion criteria were included in the study. Patients interrogated in detail regarding pain with special reference to whether it originated from hip only or from somewhere else. Any deformity of neck, spine, hip and chest expansion was tabulated. Special emphasis on neck and spine movements, allergy to metals/medications, any other generalized body diseases or affection likely to influence surgery or its outcome were evaluated and documented.

An exhaustive general physical and hip examination was done to know the patient's fitness for surgery, its expected outcome and postoperative rehabilitation plan to be carried out after surgery. Detailed spine and chest examination was done to see any anticipated difficulties during endotracheal intubation. Preoperative consultation with the anaesthetist was done and the need for special equipment was arranged which could be required if necessary.

### Inclusion criteria

All age group patients with good bone stock, longer life expectancy who required THA for painful disabling hip included in the study.

### Exclusion criteria

1. Revision surgery
2. Active infection of hip joint
3. Mismatch between patient's expectations and outcome of surgery
4. Intra operative change of plan

### Observations and Results

This study was conducted in Department of Orthopaedic Surgery, Indira Gandhi Medical College, Shimla, Himachal Pradesh. Total 24 hips (19 prospective, 5 retrospective) in 20 patients were taken for study. In four patients bilateral THA done using short femoral stem.

Mean age was 44 years. 30-60 years of age was the most common age group operated and males predominated in our study. Left side was operated most frequently than right, while in 20% patients were operated bilaterally and all of them were less than 50 years of age. Avascular necrosis with secondary osteoarthritis (60%) was the most common indication. One patient of fracture neck femur with polyarticular rheumatoid and one patient of fracture neck femur with ankylosing spondylitis was operated.

Table 1. Modified Harris Hip score

Score	Pre-operative %	Last follow up Harris Hip score %
90-100 (Excellent)	0	80
80-89 (Good)	0	16
70-79 (Fair)	0	4
< 70 (Poor)	100	0
Total	100	100

On final follow up total hip score was excellent in 80 % cases and good in 16 % cases and fair in 4% cases while pre- operative score was poor in all cases. Average pre op Harris hip score was 19.75, and on last

follow up average harris hip score was 91.66. There was statistically significant change of pre operative score to last follow up score with p- value < .001

Table 2. Modified Harris Hip score in relation with Indications for surgery:

Indications for surgery	90-100 (Excellent)	80-89 (Good)	70-79 (Fair)	<70 (Poor)	Total	%
AVN with secondary OA	14	1	0	0	15	62.5
# NOF	1	0	1	0	2	8.3
Ankylosing spondylitis	3	0	0	0	3	12.5
Psoriatic arthritis	1	1	0	0	2	8.3
Post infection sequelae	0	2	0	0	2	8.3
total	19	4	1	0	24	100

AVN with secondary OA : avascular necrosis with secondary osteoarthritis # NOF : fracture neck of femur In avascular necrosis with secondary osteoarthritis out of 15 patients; 14 had excellent hip score while one was

in good category. One case of psoriatic arthritis was in excellent while one was in good category. One patient of fracture neck femur with polyarticular rheumatoid was in fair category.

Table 3. Modified Harris Hip score in relation to Duration of surgery: -

DOS (in minutes)	90-100 (Excellent)	80-89 (Good)	70-79 (Fair)	<70 (Poor)	Total	%
100-130	5	1	1	0	7	30
131-160	11	1	0	0	12	50
161-190	3	2	0	0	5	20
Total	19	4	1	0	24	100

DOS: duration of surgery

Modified harris hip score was excellent in 11 cases (45%) where duration of surgery was 131-160 minutes, in 5 cases (22%) where duration was 100-130 minutes.

Table 4. Modified Harris Hip score in relation to Partial weight bearing: -

PWB (in weeks)	90-100 (Excellent)	80-89 (Good)	70-79 (Fair)	< 70 (Poor)	Total	%
1-2	18	2	0	0	20	84
3-4	1	2	1	0	4	16
Total	19	4	0	0	24	100

PWB : partial weight bearing

PWB was started at 1-2 weeks in 84 % cases and at 3-4 weeks in 16 % cases. Partial weight bearing was not

delayed beyond 4 weeks in any patient.

Table 5. Modified Harris Hip score in relation to Full weight bearing: -

Full weight bearing (in weeks)	90-100 (Excellent)	80-89 (Good)	70-79 (Fair)	< 70 (Poor)	Total	%
5-6	10	1	0	0	11	46
7-8	8	2	0	0	10	42
>8	0	2	1	0	3	12
Total	18	5	1	0	24	100

Modified Harris Hip score was better in patients where full weight bearing was started early. Patients had excellent harris hip score in 42 % cases who were allowed full weight bearing at 5-6 weeks and in 32 % cases where full weight bearing started at 7-8 weeks .

**Discussion**

Average Modified Harris Hip score improved from 20 to 92. Mean preoperative score was 20, increased to 70 at 6weeks, 86 at six months, 90 at one year & 92, when the patient last followed-up. With time HHS still continued to increase gradually till last follow up in prospective cases. In our study selection of prosthesis was dependent upon age, life style, bone stock, financial status of patient. Above all it was preoperative finding of hip joint that was main deciding factor for the type of prosthesis. Most of these patients presented to us very late and their primary THR was akin to revisions. The longevity of implant can further be increased by using improved surface bearing of choice like ceramic on polyethylene and ceramic on ceramic individualized to the patient. In the study by Kim et al<sup>3</sup> mean preoperative harris hip score was 41 points which improved to a mean of 96 with a mean follow up of 8.8 years. In the study by Richard et al<sup>4</sup> preoperatively, mean HHS was 47 and at last followup, mean HHS was 88. In a study by Kalman Toth et al<sup>5</sup>

mean pre operative HHS was 38, mean post operative HHS was 77 at 6 months, 89 at 12 months and 88 at 24 months. In a study by Capone et al<sup>6</sup> mean Harris Hip score preoperatively was 53 which increased to 90 postoperatively at average follow up of 5.6 years. In a study by Santori et al<sup>7</sup> harris hip score improved from 44 preoperatively to 95 at final follow up with mean follow up of 8 years. Our study showed the same pattern.

**Conclusion**

Modified Harris hip score has improved on an average from preoperative score of 20 to postoperative score of 92.

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