Original Research Paper

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STUDY OF FUNCTIONAL OUTCOME OF TOTAL KNEE ARTHROPLASTY USING THE KNEE SOCIETY SCORE IN OSTEOARTHRITIS, A FIVE YEAR FOLLOW UP.

Orthopaedic

KEYWORDS: Total Knee Replacement(TKR), Knee society scoring system, osteoarthritis

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ABSTRACT

Osteoarthritis is thought to be the most prevalent chronic joint disease. The incidence of osteoarthritis is rising because of the ageing population and the epidemic of obesity. Pain and loss of function are the main clinical features that lead to treatment,including non-pharmacological, pharmacological, and surgical approaches. in surgical approaches total knee arthroplasty most popular method ,our study analyze the clinical, functional of Total Knee Arthroplasty at short term 5 years follow up. **MATERIAL AND METHOD**- This is a retrospective study done on patients who underwent Total Knee Arthroplasty using posterior cruciate substituting design in osteoarthritis . Total of 30 patients of both sex were included in this study. In all the knees Cruciate Substituting design used.The Knee society scoring(KSS) system used most commonly. Follow up period was 1 month,6 month,one year,and five year. **RESULTS**- The age group ranged from 50 to 80 with an average age of 63.6 years.There was no intra op or immediate post op complications. The average pre op KSS score was 28 and post op KSS score at final follow up was 97. The Pre Operative Functional score average was 41.53 and the Post Operative average at five year follow up is 88.49. **DISSCUSION**- The primary objective of our method of knee replacement is to preserve normal kinematics of the knee with an implant whose geometry is compatible with the mechanics of the ligaments and muscles. Since in TKR the geometry of the femoral component duplicates normal anatomy and the articular surfaces of the tibial component allow unconstrained rotatory and anteroposterior displacement as dictated by the ligaments.With careful attention to surgical technique and balancing the knee, orthopedic surgeons should expect similar results with TKR whether they resurface patella or not. This study has 2 limitations, Short term five year follow-up of clinical results and Number of enrolled patients is small.

INTRODUCTION

In most arthritic knees, some degree of instability, deformity, contracture or acombination of these elements, can be found. The common causes of arthritis of the knee include Osteoarthritis (OA), Rheumatoid Arthritis (RA), Juvenile Rheumatoid Arthritis , Post traumatic Arthritis or secondary Osteoarthritis and other types of inflammatory arthritis.

Osteoarthritis is thought to be the most prevalent chronic joint disease. The incidence of osteoarthritis is rising because of the ageing population and the epidemic of obesity. Pain and loss of function are the main clinical features that lead to treatment,including non-pharmacological, pharmacological, and surgical approaches. [1]

The concept of improving knee joint function by modifying the articular surfaces has received attention since the 19th century.

The surgical techniques has varied from soft tissue interposition arthroplasty to resection arthroplasty to surface replacement arthroplasty. In surface replacement arthroplasty different types of prosthesis were developed to address the complex knee kinematics.

Total Knee Arthroplasty (TKA) is now a reliable treatment for severe arthritis. Various systems are available with specific features regarding the geometry of the components, the degree of conformity of the articulating surface and the anchoring technique.

The Knee Society Score System is subdivided into a knee score that rates only the knee joint itself and a functional score that rates the patient's ability to walk and climb stairs. The dual rating system eliminates the problem of declining knee scores associated with patient infirmity2.

AIMS

To study the clinical, functional outcome in a consecutive series Of Primary Total Knee Arthroplasty using Knee Society Score.

OBJECTIVES

To compare the Knee Clinical Score pre-operatively and post-operatively

To compare the Knee Functional Score pre-operatively and post-operatively.

To study the association between the Knee Clinical Score and the Knee Functional Score.

MATERIALS AND METHODS

This study will be done to analyse the clinical,and functional outcome of Total Knee Arthroplasty using Knee Society score using a Posterior cruciate substituting knee prosthesis . A retrospective study from the period of jan 2012–feb 2012.patients who will be consented and will undergo Total Knee Arthroplasty in Dr. S.N. MEDICAL COLLEGE JODHPUR will be assessed clinically,and functionally using Knee Society score.[2]

The follow up period will be at 3 months, 6 months and 1 year and at 5 year follow up. The study conducting at the Department of Orthopaedics, DR SN MEDICAL COLLEGE JODHPUR and attached hospitals .

INCLUSION CRITERIA

All patients of O.A. who underwent Primary Total Knee Arthroplasty in Dr SN MEDICAL COLLEGE JODHPUR and attached hospitals.
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Both bilateral and unilateral Total Knee Arthroplasty.

EXCLUSION CRITERIA

Intraoperative and Postoperative fractures. (Periprosthetic fractures)

Any co morbidity that prevents the patient from early mobilisation. Inflamatory disorders eg,RA

OBSERVATION AND RESULTS

The majority of the patients were from the age group of 61-65 years which accounts for 33.3 % of patients in our study. The youngest patient was 50 years of age and the oldest patient was 80 years. The mean age was 63.6 year .There was a female predominance in the ratio of 2 : 1 in our study, accounting for 67% of the patients.There was a 40 % knee were of left side,46.6% were of right side and 13.3 % of knee had bilateral involvement and accordingly unilateral and bilateral TKR was done.

TABLE : 1 - KNEE CLINICAL SCORE

	N	MEAN	MEDIAN	MODE	STANDARD DEVIATION	MINIMUM	MAXIMUM
Pre – op	30	28	28	26	5.11	14	39
Post - op	30	97	97	98	17.70	80	99

The **average pre - op Knee Clinical Score was 28 in this study which improved to an average post – op score of 97**

TABLE : 2 - GRADING OF KNEE CLINICAL SCORE

	REQUENCY	PERCENT
EXCELLENT	27	90
GOOD	3	10.0
Total	30	100.0

According to the Knee Society Clinical Scoring system of the 30 patients assessed in this study 27patients (90%) had Excellent, 3 patients (10 %) had Good, results.

TABLE : 3 - KNEE FUNCTIONAL SCORE

	]	MEAN	MEDIAN	MODE	STANDARD DEVIATION	MINIMUM	MAXIMUM
Pre – op	30	41.83	45.00	45	9.33	20	50
Post - op	30	88.79	90.00	90	8.62	60	90

The average pre - op Knee Functional Score was 41.53 in this study which improved to an average post – op score of 88.79

TABLE : 4 - GRADIN G OF KNEE FUNCTIONAL SCORE

	REQUENCY	PERCENT
EXCELLENT	17	56.6
GOOD	11	36.6
FAIR	2	6.7
Total	30	100.0

According to the Knee Society Functional Scoring system of the 30 patients assessed in this study 17 patients (57%) had Excellent, 11 patients (37%) had Good, 2 patients (7%) had Fair results.

TABLE : 5 KNEE CLINICAL SCORE AND KNEE FUNCTIONAL SCORE CROSS- TABULATION

Knee ClinicalScore		Excellent	Good	Fair	Total
Excellent		17	10		27
Good			1	2	3

Knee Functional Score

Out of the 27 patients who had Excellent Knee Clinical Scores, 17 patients (62.95%) had Excellent Knee Functional Scores, 10 patients (37.03%) had Good Knee Functional Scores.

Out of the 3 patients who had good Knee Clinical Scores, 1 patient (33.3%) had Good Knee Functional Score, 2 patients (66.7%) had Fair Knee Functional Scores.

The Chi-Square value was 49.860, the P value was highly significant (< 0.001) indicating significant association between Clinical Knee Score and Functional Knee Score at one year follow up of Total Knee Arthroplasty.

TABLE : 6 COMPARISON BETWEEN PRE-OP AND POST-OP KNEE CLINICAL AND FUNCTIONAL SCORES

	PAIRED DIFFERENCE		t	df	'P' Value
	MEAN	STANDARD DEVIATION			
Pre –OP KCS – Post OP KCS	66.93	5.98	60.19	28	< 0.001
Pre- OP KFS – Post –OP KFS	42.06	7.96	28.44	28	< 0.001

The difference between the mean's of pre – op KCS and post – op KCS was 66.90 (64.65 to 69.30, 95% CI). The P value was significant (<0.001) when the pre - op and post – op Knee Clinical Scores were compared.

The difference between the mean's of pre – op KFS and post – op KFS was 42.06 (39.04 to 45.09, 95%CI). The P value was significant (<0.001) when the pre - op and post – op Knee Functional Scores were compared.

DISCUSSION

Total Knee Arthroplasty is generally an effective procedure and is associated with substantial functional improvement. Elderly patients who were having difficulty mobilising because of degenerative arthritic found good relief after Total Knee Arthroplasty. There was a substantial relief of joint pain, increased mobility, correction of deformity and an improvement in the quality of life of the patients following Total Knee Arthroplasty.With the varied amount of implant designs available the posterior cruciate substituting design was found to be effective.

C. Buz Swanik found that following total knee arthroplasty, patients were able to reproduce joint position and improve mobility significantly.3 In our study 30 patients who met the inclusion criteria, all the knees were operated using a Posterior cruciate substituting design.

Robert L Barrack et al. found that total knee arthroplasty with retention of the patella yielded clinical results that were comparable with those after total knee arthroplasty with patellar resurfacing.[4]

krivanek et al reported the results at three year follow up as the average results in the bilateral vs the control group were as follows: the Womac score, 39.4/42.2 pre-operatively, 87.2/71.0 at 3 years; KSS 1, 48.5 / 44.8 pre-operatively, 87.4 / 79.9 at 3 years; KSS 2, 44.1 / 50.6 pre-operatively, 86.1 / 72.8 at 3 years; motion-flexion, 105.2° / 105.7° preoperatively, 114.0° / 100.2° at 3 years.[5]

zhong q et al Average follow-up duration w[a]s 13.3 years (range 12 to 15 years). Compared with preoperative ones, KSS knee score, KSS functional score and range of motion improved significantly (pre-operation: 26±16, 34±18, 87°±25°; follow-up time: 93±8, 78±27, 114°±22°) (t=45.55, 15.60, 13.03, all P<0.01)[6]

anderson mj et al reported at 5 year follow up Preoperative mean KSS and flexion were 33 and 107°, respectively, improving at latest follow-up to 90 and 121°, respectively[7]

ranawat et al reported high flexion knee outcome at one year, Mean Knee Society score was 95, and mean knee flexion was 125°, yet 20% of patients could neither kneel, nor squat, nor sit on their heels. Fifty-seven percent were able to kneel without significant difficulty; 69% were able to squat without significant difficulty; and 46% were able to sit on their heels without significant difficulty.[8]

Insall in his series reported mean postoperative knee score of 92 and functional score of 66. [9]

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vinesh et all reported in 26 case series Mean preoperative clinical score was 38.[8]

(range: 18 to 77). Mean postoperative clinical score was 76.8 (range: 0 to 94).[10]

p.l.s.li,zamora et al Using the newer rating system of the Knee Society, the mean score at ten years was 87 and the mean functional score 56. The arc of flexion improved from a mean preoperative value of 88° to 100°.[11]

in our study ,preoperative mean knee score was 28 and preoperative mean knee functional score was 41.53.At follow up mean knee score was improved to 97at one and five year follow up .and knee functional score was improved to 88.49. so the results in our study were comparable to those of anderson,zhong, insa[ll.]

lastak et al noticed At the final follow-up, 6.5% of the patients were not satisfied with the outcome. The patients' overall satisfaction was 90.2 %[12]

In our study, none of the patellas were resurfaced. All patellas were circumferentially denervated. There was no anterior knee pain in any of our subjects.The Knee Society Score was used to assess the outcome of Total knee Arthroplasty. The knee Society Score rating system was a logical outgrowth of the Hospital for Special Surgery (HSS) rating system.The Knee Society Score system separates findings in the operated knee with findings in the patients function. The system is subdivided into a knee clinical score that rates only the knee joint itself and a knee functional score that rates the patient's ability to walk and climb stairs. As such the knee clinical score is not artificially affected by co morbid conditions. The scoring system combines a relatively objective knee clinical score that is based on the clinical parameters and a knee functional score based on how the patients perceives that knee function with specific activities.In our study there was significant improvement of Knee Clinical Score and Knee Functional Score following Total Knee Arthroplasty

CONCLUSION

Total Knee Arthroplasty improves the functional ability of the patient and the ability of the patient to get back to pre-disease state, which is to have a pain free mobile joint, as reflected by the improvement in the post-op Knee Clinical Score and Knee Functional Score.With the use of posterior cruciate substituting design, at 5 year follow up an average pre-op Knee Clinical Score of 28 improved to an average post-op Knee Clinical Score of 97 and an average pre-op Knee Functional Score of 41.53 improved to an average post-op Knee Functional Score of 88.49. There was significant association between the Knee Clinical Score and Knee Functional Score at five year follow up.The Knee Society Score is an effective scoring system as it incorporates clinical and functional outcome following Total Knee Arthroplasty.

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