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Total Knee Replacement in Shree Birendra Hospital: An Early Experience

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ABSTRACT

INTRODUCTION: Total knee replacement is established as one of the most successful surgical procedure for relief of pain and restoration of function in arthritic knees. Total knee replacement is done routinely in very few centers in Nepal and only few outcome studies have been published. The aim of this paper is to present the outcome of total knee replacement done in Shree Birendra Hospital over a period of three and a half years.

METHODS: Sixteen total knee replacements which were carried out in Shree Birendra Hospital of Kathmandu between May 2011 and December 2014 were included in the study. Cemented fixed bearing implant PFC Sigma (Depuy,USA) were used in all cases. Postoperative rehabilitation protocol of our institute was followed. Patients were reviewed at 6 weeks, 12 weeks, 6 months, one year and annually then onwards. Outcome in terms of Knee Society Score as well as Knee Society Functional Score were measured.

RESULTS: A total of 16 total knee replacements were performed on 14 patients. There were two bilateral total knee replacements and 12 were unilateral knee replacements. The mean age of the patients was 59.3 years (range 45-75 years). The commonest reason for knee replacement was primary osteoarthritis. The average follow up period was 34 months (range 24 to 47 months). There was no post-operative infection. One patient developed a patellar clunk. Post operatively both the Knee Society Score (KSS) as well as Knee Society Functional Score (KSFC) showed statistically significant improvements.

CONCLUSIONS: Total knee replacement provides significant relief of pain and improvement of function in advanced stage arthritis of knee.

KEY WORDS: Knee Society Functional Score, Knee Society Score, Total knee replacement.

INTRODUCTION

Total knee replacement (TKR) remains one of the most successful and cost effective interventions in medicine[1]. TKR is a surgical procedure whereby an unbearably painful knee is replaced by a prosthesis, converting it into an almost painless one.

It is most commonly done to treat a painful knee caused by advanced osteoarthritis in the elderly that renders them unable to pursue even activities of daily living. It offers reliable relief of pain and improvement in quality of life along with improvement in function of patients suffering with advanced osteoarthritis or inflammatory

arthritis of the knee[2]. Other indications are any painful, disabling joint disease of the knee resulting from post-traumatic arthritis or as sequelae of post-infective arthritis.

Knee replacement is usually considered only after other conservative modalities, such as physical therapy, pain medications and activity modifications have failed.

METHODS

This is a retrospective study of 16 total knee replacements performed on 14 patients from May 2011 to December 2014. Patients presenting with severe pain and dysfunction affecting their activities of daily living with radiological features of advanced stage arthritis were advised surgery. All surgeries were performed under combined spinal and epidural anesthesia. Exclusion criteria were pathological fractures around the knee secondary to malignant disease, polytrauma patients and patients less than eighteen years of age. Cemented fixed bearing implant (Depuy, USA) were used in all cases.

Deep venous thrombosis prophylaxis was given for 7 days with Injection Enoxaparin (40 mg subcutaneously, OD) subcutaneously. Patients were mobilized on 2nd postoperative day. Full weight bearing with a walker was begun on the 2nd postoperative day. Quadriceps exercises (along with foot and ankle exercises) were begun as soon as the patient could tolerate pain within reasonable limits. The wound was inspected on the 5th postoperative day and on the 14th day, sutures or staples removed. We encouraged the patients to walk from the beginning, and also provided regular physiotherapy services till their discharge in two weeks. Patients were reviewed at 6 weeks, 12 weeks, 6 months, one year and annually from then onwards.

The data of both preoperative and postoperative outcomes of Knee Society Score (KSS) as well as Knee Society Functional Score (KSFS) was entered into Excel Sheet and analysis was done using statistical software SPSS version 20.

RESULTS

There were 2 bilateral and 12 unilateral total knee replacements. 8 patients were females and 6 were males. 10 knees had replacements done on the left side whereas 6 knees had it done on the right side. The average age of the patients was 59.3 years (range 45-75 years). 10 knees had primary osteoarthritis, 3 knees had post-traumatic osteoarthritis, 2 knees had rheumatoid arthritis and 1 knee had post-tubercular arthritis. The average follow up period was 34 months (range 24-47 months). There was no postoperative infection. 1 case developed a patellar clunk, which was corrected surgically. The mean preoperative Knee Society Score was 50.13 (range 18-67) and Knee Society Functional Score was 58.31 (range 5-80). At the last follow up, the mean post-operative Knee Society Score was 88.00 (range 77-97) and the mean postoperative Knee Society Functional Score was 79.06 (range 65-98). There was a significant improvement in knee function after the knee replacement as was evident from the post-operative knee scores ($p< 0.001$). On the basis of the Knee Society Scores, 12 knees (11 patients) had excellent results and 4 knees (3 patients) had good results.

DISCUSSION

Total knee replacement is the treatment of choice in chronic knee pain and disability resulting from advanced arthritis of the knee when all conservative methods of treatment have failed. However, before proceeding for surgery, other sources of knee and leg pain must be sought out and systematically excluded. These include radicular pain from spinal disease, referred pain from the ipsilateral hip and peripheral vascular disease. Besides relieving pain, TKR greatly improves the quality of life of the person after surgery.

KC et. al.[3] have shown combined spinal and epidural analgesia effectively manages postoperative pain. We too have used combined spinal and epidural analgesia in all our cases

undergoing total knee replacement achieving effective peri-operative pain management.

There are various drugs (oral and parental) as well as mechanical devices that are available today for prevention of deep venous thromboembolism. Aspirin has been a tested and preferred drug since long[4]. However, it has its side effects (especially gastro intestinal) which makes it unsuitable for some patients. Enoxaparin has shown good efficacy when used subcutaneously[5,6]. We routinely give Injection Enoxaparin subcutaneously in our institution for one week post-operatively. We have not had any thromboembolic episode in our series.

Bleeding is a worrisome prospect during the peri-operative period. Hourlier et al[7] and Benoni et al[8] showed that tranexamic acid can be effective in reducing it when given intravenously. Konig et al[9] showed that it could also be effective when given topically. We give 1 gram of Tranexamic acid intravenously just before giving the incision. We did not encounter any significant peri-operative bleeding in our study.

Deep infection is the most dreadful complication after a total joint replacement. It is devastating both for the patient and the surgeon. Over the years, it has been brought down to less than two percent in most large centers[10].There was no infection in our series.

Patellar clunk as described by Beight et al[11] can occur due to a post operative scarring in the quadriceps tendon, which develops into a fibrous nodule, that catches on the anterior edge of the femoral component and eventually releases with a painful clunk allowing the leg to extend. Femoral component design, and post-surgical inflammation are potential etiologic factors of this complication. One of our patients developed patellar clunk.We excised the nodule surgically and relieved the patient's symptoms.

Patellar resurfacing in total knee replacement remains a controversial subject. Burnett et.al, showed no significant difference between the groups for all outcome measures at a minimum of 10 years of follow up,[12] while He J –Y et. al. in their series indicated that although the risk of reoperation after total knee replacement would be slightly lower, more trials are required to further authenticate the results[13]. We do not routinely resurface the patella. If we see that the patellar width is not sufficient, we only shave off the articular surface without placing a patellar button.

Smith et al mentioned that it was safer to use sutures than staples in 2010[14]. We still use staples, whenever they are available and have so far not encountered any problems.

The hunt for an ideal antiseptic solution has led to various researches. Meurs et al showed that povidine – iodine is an optimal solution for postoperative dressing[15]. We have been using povidine – iodine for all our cases.

The role of physical therapy is vital in the postoperative recovery after a joint replacement. Kuster et al[16] concluded that patients after total knee replacement should alternate activities such as power walking and cycling but jogging or running should be discouraged. It has been observed that patients who have lower preoperative function may require more intensive physical therapy intervention, as they are less likely to achieve functional outcomes similar to those of patients who have lesser preoperative dysfunction[17]. It has also been documented that some patients will participate in high-impact sports and enjoy excellent clinical outcomes at a minimum of 4 years after surgery[18].We followed the postoperative rehabilitation protocol of our institute and the recovery of our patients have been smooth.

S. No	Name	Age (in Yrs)	Sex	Diagnosis	Implant		Compli cations	KSS		KSFS		Results (As per KSS Score)
								Pre Op	Post Op	Pre Op	Post Op	
1		45	F	Post Tr OA	Depuy (Lt)		Nil	55	90	65	80	Excellent
2		45	F	Post Tr OA	Depuy (Lt)		Nil	50	92	67	80	Excellent
3		65	M	OA	Depuy (Lt)		Patellar clunk (was revised surgically	53	78	47	74	Good
4		63	M	Post TB Arthritis	Depuy (Rt)		Nil	55	77	48	73	Good
5		48	F	Post Tr OA	Depuy (Rt)		Nil	47	89	53	70	Excellent
6		67	F	OA	Depuy (Lt)		Nil	48	93	58	70	Excellent
7		67	F	OA	Depuy (Rt)		Nil	18	90	40	65	Excellent
8		60	M	OA	Depuy (Rt)		Nil	51	90	71	90	Excellent
9		60	F	OA	Depuy (Lt)		Nil	51	89	70	89	Excellent
10			F	OA	Depuy (Lt)		Nil	52	92	45	66	Excellent
11		64	M	OA	Depuy (Lt)		Nil	54	89	65	76	Excellent
12		60	M	RA	Depuy (Rt)		Nil	40	79	53	77	Good
13		65	M	OA	Depuy (Lt)		Nil	53	93	65	85	Excellent
14		55	M	OA			Nil	67	97	45	98	Excellent
15		60	M	RA	Depuy (Lt)		Nil	63	78	72	85	Good
16		55	F	OA	Depuy (Lt)		Nil	45	92	69	87	Excellent

The Knee Society rating system was first promulgated during the late 1980's and has become the standard clinical evaluation system for reporting results for patients undergoing Total Knee Replacement. The Knee Score consists of points given for pain, range of motion, and stability in both the coronal and sagittal planes, with deductions for fixed deformity, and extensor lag. The Function Score consists of points given for the ability to walk on level surfaces, and the ability to ascend and descend stairs, with deductions for the use of external supporting devices. The Knee Society Score is usually reported as the two scores, Knee Score and Function Score, rather than a summation score.

Kane et al[19] in their research showed the preoperative Knee Society Score as 41.1 and postoperatively as 82.4. Likewise, Long et al[20] in their long term study, showed that their average Knee Society score was 87.4 points and the average Knee Society functional score was 62.1 points. In our series, although it was a small one, the Knee Society Score as well as Knee Society function Score significantly improved postoperatively. (Chart -1)

CONCLUSIONS

TKR provides significant relief from pain and improvement of the function of advanced stage arthritis of knee. We believe that this procedure is effective in selected patients.

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