



Total Knee Arthroplasty in Patients with Osteoarthritis of the Knee Joint Secondary to the Contralateral Hip Disorder

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Introduction

It is known that severe disorder of the hip joint leads to secondary osteoarthritis of the contralateral or ipsilateral knee joint. Smillie defined such a state as coxitis knee [1]. Total knee arthroplasty (TKA) provides pain relief and improves function in patients with osteoarthritis of the knee. In this study, we investigated the usefulness of TKA for coxitis knee and the early outcomes of patients undergoing this procedure.

Patients and Methods

Five female patients (mean age, 73.0 years), who underwent primary TKA for coxitis knee, were included in the study. The mean follow up period is 38.0 months (range: 24 to 47 months). Of the 5 patients, 1 had fusion of the contralateral hip joint due to tuberculosis arthritis, 1 had undergone total hip arthroplasty (THA) of the contralateral hip joint prior to study inclusion, and 3 had a functional leg length discrepancy due to severe osteoarthritis of the contra lateral hip joint. The mean leg length discrepancy in the patients was 3.6 cm (Table 1). Primary TKA was indicated because of advanced symptomatic osteoarthritis of the knee.

Results

The mean femoro-tibial angle (FTA) increased from 167.8° before surgery to, 173.2° after surgery. A constrained TKA implant was needed in 2 patients because of a severe valgus deformity and insufficiency of the collateral ligaments. Two patients required corrective shoes as their functional leg length discrepancy did not improve after TKA. None of the patients had serious complications during the postoperative period, and all were able to walk with a cane after the surgery. No radiolucent lines or instability of the knee joint was seen in any of the patients (Table 2).

Case

Female, 75years old.

Past history

Arthrodesis of the left hip joint secondary to tuberculous arthritis, Hypertension.

Case	Age	Sex	Hip condition Contralateral	Leg length discrepancy	Surgery
1	75	Female	Tuberculosis arthritis	6.0 cm	Right TKA
2	67	Female	Osteoarthritis	2.5 cm	Left THA+ Right TKA
3	63	Female	Osteoarthritis	4.0 cm	Left TKA
4	75	Female	Osteoarthritis	4.5 cm	Left TKA
5	85	Female	After total hip arthroplasty	1.0 cm	Left TKA
Average	73.0 years			Average 3.6 cm	

Table 1: Calculation of mean leg length discrepancy.

Case	Implant	FTA(before surgery)	FTA(after surgery)	How to correct leg length discrepancy
1	CCK	137*	172*	Corrective shoes
2	CCK	164*	176*	Left THA
3	PS	177*	173*	none
4	PS	167*	175*	Corrective shoes
5	PS	194*	170*	none
		Average 167.8*	Average 173.2*	

Table 2: Identification of radiolucent lines or instability of the knee joint.

Present history

The patient started experiencing right knee pain 10 years ago, which increased gradually. At the time of evaluation, she was unable to walk, because of pain and instability of the right knee.

Present condition

The right knee joint had a severe valgus deformity and was unstable; the patella was dislocated (Figure 1); the left hip joint was ankylosed secondary to arthrodesis (Figure 2); and the lower leg length discrepancy was 6 cm.

Operation findings

Under general anesthesia, the varus stress corrected the valgus deformity; however, the valgus stress worsened the valgus deformity (Figure 3). This deformity represented the insufficiency of the medial collateral ligament. As for the lateral tibial plateau, a cave-in of approximately 1.5 cm was accepted with a focus on the load part. In the lateral condyle of the femur, a bone cartilage loss of diameter approximately 2 cm approximately 1 cm in depth was accepted. And the anterior cruciate ligament was missing. We used a constrained type implant, because of the extreme instability of knee joint resulting from the medial collateral ligament insufficiency (Figure 4).

Roentgen findings

The FTA improved from 137° before surgery to, 172° after surgery. The mechanical axis, which passed far from the knee joint before surgery, passed through the center of the knee joint after surgery (Figure 5).

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Figure 1: The patella location.



Figure 2: The left hip joint was ankylosed secondary to arthrodesis.



Varus stress Neutral position Valgus stress

Figure 3: The valgus deformity.

Postoperative course

The patient was able to walk with a cane. However, she required corrective shoes, as the functional leg length discrepancy was not corrected by TKA.

Discussion

The causes of coxitis knee include, but are not limited to malposition and contracture of the hip joint, and leg length discrepancy [2,3]. Generally, the femur rotates internally at the time of heel contact. However, the femur is not able to rotate after hip arthrodesis, or in the presence of a hip contracture. This leads to excessive stress on the contralateral or the ipsilateral knee joint, eventually resulting in a valgus or varus deformity of the knee joint. Some of the ways by which the leg length discrepancy is compensated for are pelvic obliquity, scoliosis, valgus of contralateral knee joint, varus of contralateral knee joint, flexion of contralateral knee joint, dorsiflexion of ipsilateral ankle joint, and use of corrective shoes. The leg length discrepancy may cause the development of knee deformity and knee pain. Surgery is indicated if the pain is aggravated by daily activities making everyday life difficult. THA is indicated for hip joint impairment and TKA for knee joint impairment. However, it is unclear whether THA or TKA should be carried out first. In case of ipsilateral hip and knee osteoarthritis, using local anesthetic injection to the hip joint may help to differentiate between referred and true knee pain. If coxitis knee patients undergo only TKA, excessive stress on the knee joint is not improved and patients are concerned about the recurrence of the knee joint deformity or the



Constrained TKA implant

Figure 4: The medial collateral ligament insufficiency.



Before surgery After TKA

Figure 5: Knee joint after surgery.

instability [4-6]. In that case, the standard approach is to perform the THA first. THA improves the hip contracture, leg length discrepancy, and leg alignment. However most of the coxitis knee patients complain of knee pain, and very few patients complain of a hip pain. It is difficult for us to perform THA in patients who do not complain of a hip pain. In these patients, we perform the TKA first and we provide the patient with corrective shoes or braces. It is necessary to explain to the patients that hip joint is responsible for the knee joint disorder, and therefore, it is important to treat the hip joint to decrease the burden on the knee joint.

Conclusion

TKA is a safe and reliable procedure for providing pain relief and improving function in patients with osteoarthritis of the knee joint secondary to the contra lateral hip disorder. However, functional leg length discrepancy is not improved by TKA. Therefore further long-term observation for recurrence of knee joint deformity or instability is required.

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