

Total knee prosthesis: Applications in our clinic and preliminary results

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Total diz protezi: Klinik uygulamalarımız ve erken sonuçlar

Haziran 1991 ve Ekim 1993 tarihleri arasında 23 hastanın 25 dizine total diz protezi uygulandı. Primer patoloji 21 hastada dejeneratif osteoartrit, 3 hastada romatoid artrit ve 1 hastada hemofilik artropati idi. Protez tipleri; 13 diz de Kinemax kondiler, 9 diz ve Kinematik kondiler, 3 dizde Zimmer MG II. Aşırı medial tibial defektten dolayı iki vakada kemik grefti gerekti. 18 vakada derin ven trombozu profilaksisi için düşük moleküler ağırlıklı heparin (Fraxiparine) kullanıldı. Ortalama preoperatif 10° lik (0-30) varus deformitesi, 5.2° lik (0-11) valgus olarak düzeltildi. Preoperatif ortalama 46 olan diz skoru (20-78) (Hungerford'a göre), son kontrolde 81'e (60-88) yükseldi. Postoperatif 2 hastada sinovit gözlemlendi ve medikal tedaviye cevap verdi. Anterior diz ağrısı olan ve patella lateral subluksasyonu gösteren bir hastaya artroplastiden 13 ay sonra lateral gevşetme yapıldı. Kontrolde hastanın ağrısı yoktu. Son kontrolde 3 hastada anterior diz ağrısı görüldü. Radyolojik kontrolde hiç bir gevşeme belirtisi görülmedi. Kısa dönemde total diz artroplastisinin tatminkar sonuçlar verdiği kanısındayız.

Anahtar kelimeler: Total diz protezi, erken sonuçlar

Total knee prosthesis: Applications in our clinic and preliminary results

23 patients (25 knees) underwent total knee prosthesis between June 1991 and October 1993. The primary pathology was degenerative osteoarthritis in 21, rheumatoid arthritis in 3, and haemophilic arthropathy in 1. The types of prosthesis were Kinemax Condylar in 13, Kinematic Condylar in 9, and Zimmer MGII in 3 knees. Bone grafting was necessary in 2 cases because of the extensive medial tibial defect. Low molecular weight heparin (Fraxiparine) was used for prophylaxis of deep vein thrombosis in 18 cases. Follow-up was 3 to 23 months (av. 8 months). The average varus deformity of 10° (range; 0-30) preoperatively was corrected to 5.2° (range; 0-11) of valgus. The average preoperative knee score (acc. to Hungerford) of 46 (range; 20-78) increased to 81 (range; 60-88) at the last follow-up. Postoperatively, synovitis was detected in 2 patients and responded to medical treatment. One patient with anterior knee pain who had showed lateral subluxation of the patella underwent lateral release 13 months after the arthroplasty. She had no pain at follow-up. Three other patients had anterior knee pain at last follow-up. Radiological evaluation revealed no signs of loosening. We concluded that total knee arthroplasty gives satisfactory results in the short term.

Keywords: Total knee prosthesis, preliminary results

The knee as being a weight-bearing joint gets degenerated as a results of intrinsic and extrinsic factors and aging and this restricts the patient's mobility. So, both the morbidity and the mortality rates increase.

The idea to replace the surfaces of the knee joint initiated the clinical applications in the last 15-20 years.

Ferguson (1861) performed resection arthroplasty using fascia lata and adipose tissue. Then, the authors developed new techniques because of spontaneous fusions and excessive instability. The idea that the femoral condyles should be covered with metallic plaques was realized by Campbell and his results were published in 1940s.

Mc. Keever and Mac Intosh used metal prosthesis as tibial components. The replacement of both articular surfaces was proposed by Walldius and the prosthesis became widely used. Although, successful results have been reported, there was obvious decrease

in the mobility of the joint. After Gunston performed the prosthesis with metal-plastic combination in 1970s a new area in total knee arthroplasty started. The improvements in prosthesis designs has been leading to increasing clinical success.

Patients and methods

Between 1991 and 1993, 25 total knee prosthesis in 23 patient were performed at the Department of Orthopaedics and Traumatology at Dokuz Eylül University, School of Medicine. There were 17 women and 6 men whose ages averaged 60 years (range, 31-75 years). Primary pathologies were degenerative osteoarthritis in 21 cases, rheumatoid arthritis in 3 and haemophilic arthritis in one. Bilateral knee prosthesis (two-stages) were performed in two cases, one of them was degenerative arthritis and the other one rheumatoid arthritis. Kinemax condylar type prosthesis was performed in 13 cases, Kinematic condylar type in 9 cases, Zimmer MG II type in 3 cases. Low-

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molecular weight heparin (LMWH) (Fraxiparine) was administered for thrombosis prophylaxis in 18 patients. Mean operation time was 100 minutes and mean blood transfusion was one unit. Grafting was needed in two patients because of the excessive medial tibial defect. One of the patients had high tibial osteotomy prior to the index operation. Jones compression bandage was applied to all patients after the operation. Two haemovac (HMOV) drains were used and removed two days after the operation.

There after, active and passive exercises were started and the patients were discharged with crutches. The patients were assessed according to Hungerford knee scoring system (7, 10, 13, 14). Since pain was assessed in 50 points; refractory pain was accepted as an indication for operation in our trial (1, 6, 8). In postoperative assessment A.P. and lateral, tunnel and tangential X-rays, lower extremity orthorengenographs and 45° flexion weight-bearing P.A. X-rays were obtained.

Mechanical axis was measured preoperatively and postoperatively in all patients and compared. Radiolucent criteria were not assessed, because follow-up duration was short. The patients were followed mean 8 months (3-23 months). Detailed physical and radiological controls were made and documented by the same surgeon.

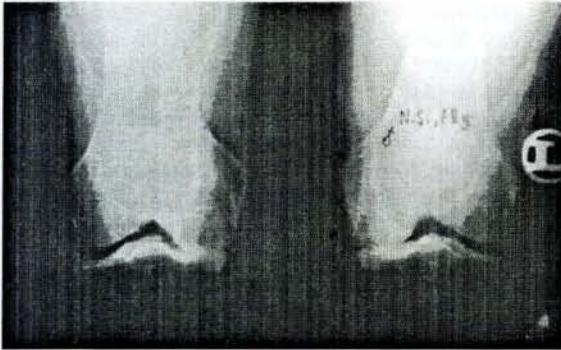


Figure 1a: Preoperative 45° flexion weight-bearing PA X-ray

Results

Preoperative knee score of average 46 (20-75) increased to 81 (60-88) at the last follow-up. Range of the motion (R.O.M.) was 97.8° (80-120°) prior to operation while it was at the last follow up. The mechanical axis deviation of the knees were 10° varus before operation while it was 5.2° valgus after the operation and it was observed that this deviation was in physiological limits. The mean flexion contracture was 17° (5-30°) in 16 patients before the operation, while it was 7° (5-10°) in 8 patients after operation.

Pain was relieved completely in 17 patients and there were no complaints at follow-up. Two patients relieved with medical treatment (NSAID, rest and cold application).

Three patients had anterior knee pain one of them was not satisfied, one patient with Parkinson disease had lateral subluxation and lateral retinacular

release was added 13 months later. There was no superficial or deep infection in any patient. Although, there were no radiolucencies on X-rays it was not taken in to consideration due to short follow-up.



Figure 1 b: Preoperative lateral X-ray

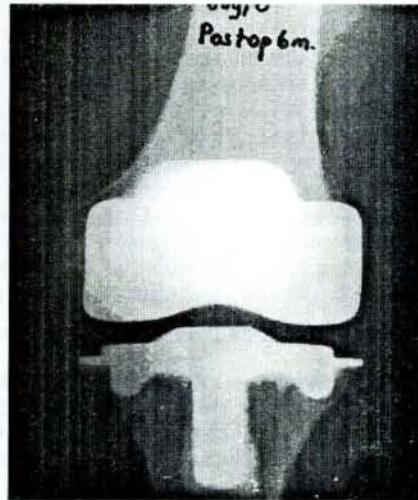


Figure 2 a: Postoperative 6th month PA X-ray

Discussion

The studies on knee arthroplasty began with hemiarthroplasties in femoral cup or tibial plate and continued with the usage of hinge-type prosthesis with fixed axis in severe cases. All these types of prosthesis have brought together many problems, such as limited motion, patellar pain, bone resorption, loosening, fracture formation around intramedullary stem and infection while they have met some needs (4). Although there have been different opinions, the indications of prosthesis have been fairly determined. The prosthesis with single compartment have been preferred in unicompartmental arthrosis while bicondylar prosthesis is used for gonarthrosis. The prosthesis with fixed axis or rotation limiting type prosthesis are preferred in cases of severe gonarthrosis or in re-

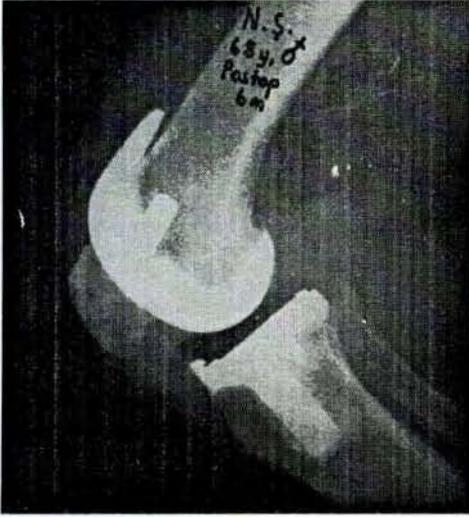


Figure 2 b: Postoperative 6th month 90° flexion lateral X-ray

vision cases (4). The discussion about total knee arthroplasty have been intensifying on whether posterior cruciate ligament (P.C.L.) should be protected or not; whether patellar surfaces should be replaced or not; and whether they should be cemented or cementless (4).

In the prosthesis in which P.C.L. is removed or protected there are not clinically significant differences. However, we have been preferring prosthesis designs in which P.C.L. is protected, because P.C.L. has a stabilizer role and absorbs shearing-forces in the A.P. plane with decreasing stresses in contact point of bone-cement line and increasing in quadriceps lever-arm and causing femoral rolling over tibial posteriorly during flexion (4). Patellar surface replacement does not give very different results then those of non-replaced. Moreover, because of the application of patellar components, some problems such as patellar fracture, dislocation of prosthesis, metal debris and patellar subluxations have been reported (1, 11). For this reason, the patella were not replaced except for case with severe damaged joint surfaces. The early results of our cases were found to be comparable to the literature (1, 3, 4, 5, 9).

Generally, total knee arthroplasties completely relieved pain and corrected the axis. We believe that these are the main indications does not improve the range of motion significantly. The fact that there are many prosthesis designs is the evidence that an ideal prosthesis type has not been found yet.

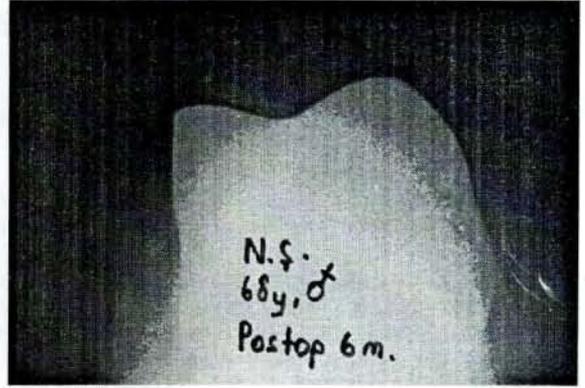


Figure 2 c: Postoperative 6th month tangential X-ray

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