World Applied Sciences Journal 21 (3): 389-393, 2013
ISSN 1818-4952

DOI: 10.5829/idosi.wasj.2013.21.3.2634

Bilateral Primary Total Knee Arthroplasty Using Revision Implants Due to Severe Varus Deformity in Proximal Tibia

Marwan M. Zamzami and J.M.C. Abos

Department of Orthopedic Surgery, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Abstract: We report a case of 66 years old man with sever osteoarthritis (OA) in both knees with severe varus deformity. Patient was treated with bilateral total knee arthroplasty (TKA) simultaneously with wedge augmentation of medial tibial plateau depression of both knees to restore the weight bearing axis of lower limbs. The sequence of treatment was provided. Although the recent trend is unilateral TKA and not to address both knees at the same time, this patient was operated same day keeping in mind the challenging surgery of primary bilateral total knee arthroplasty using revision armamentum and all the possible complications of a lengthy surgery, but the rational was to provide rehabilitation simultaneously to both knees and to maximize the functional outcome of the surgery. Patient was functionally scored prior and post-surgery using international knee score. We report excellent outcome of the procedure using the full potential of a rehab facility.

Key words: Total knee arthroplasty · Extensive rehabilitation · Saudi Arabia

INTRODUCTION

Currently, the lifetime risk of developing symptomatic knee osteoarthritis (OA) is approximately 50% [1]. Knee OA is a leading cause of disability in persons in the developed countries and this is only projected to increase with an aging and overweight population [2]. Pain is the leading symptom of OA and is often chronic in nature, leading to significant morbidity and decreased quality of life [3]. Knee osteoarthritis commonly requires joint replacement, substantially reduces quality of life and increases healthcare utilisation and costs [4]. The safety of simultaneous bilateral total knee replacement remains controversial. Some studies have demonstrated a higher rate of serious complications, including death, following bilateral procedures, whereas others have suggested no increase in the complication rate [5, 6]. However, the systematic differences in patient gender, hospital and surgeon volume and geographic region between those who undergo simultaneous total knee replacements [7]. As the literature is mostly covering the western world, the situation is quite different in the Arab countries where social, religious and multiple other factors influence the patients' decision to get definitive treatment. This report we represents a patient with sever OA in both knees with sever varus deformity and treated by TKA.

Case Description: A 66-year-old Saudi male patient presented to our institution (Ortho OPD) with complaints of pain in both knee joints with severe disability for the last ten years. The patient explained that he constantly had difficulty during daily activities; the most important concern for him was that he cannot pray normally on the floor. He was feeling better with rest. A review of his medical history indicated that the patient had been under medication for diabetes mellitus and hyperlipdemia for the past fifteen years. The rest of the patient's medical history was unremarkable and the patient appeared to be in good health and had no known allergy.

Ambulant with a limp he had popliteal angle of 10 degrees on both knees, with ROM of 10-135 on both sides. Power of muscles was +3/5 on both lower limbs in all muscle groups. X-ray revealed bilateral end stage. knee osteoarthritis (OA) in both knees with depression of the medial tibial pleatue almost 20 mm (Figure 1,2,3). Patient was offered bilateral knee arthroplasty by taking the benefit of doing surgery in a rehab facility, which he was agreed and bilateral knee arthroplasty was done. Both knees underwent primary knee arthroplasty but due to the neglected deformity, they were augmented with wedges on the medial side of the tibial tray and reinforced with stems on the tibial side only (Figure 4, 5).

Corresponding Author: Marwan Zamzami, Department of Orthopedic Surgery, College of Medicine, King Saud University, Kingdom of Saudi Arabia, P.O. Box 2925, Riyadh 11461, Tel: +966 (1) 5620000 Ext. 1882, +966 508262517

Fig. 1: Preoperative knee AP and lateral X rays

Fig. 2: Preoperative long films

Fig. 3: Preoperative picture showing the varus deformity at the knees

Patient had no post-operative complications and he was put on international knee rehab protocol. Patient did very well and on 14th post-operative day he was able to take steps on ladder and fully independent in his routine including going to toilet and walking. His range-of-motion (ROM) was 0-125 degrees actively in the initial post op period and he regained his ROM more in the latter rehab period (Figure 6).

Fig. 4: Post-operative X rays with medical tibial augmentation and stems in tibia

Fig. 5: Post- operative long films showing restoration of mechanical and anatomical alignment

Patient was scored by the international knee score pre operative and post operative and the results were striking. His overall score was 50 and functional score was 5 which improved to 95 and 70 in 3 months of time.

Fig. 6: Post-operative picture showing correction of varus deformity in both knees.

Patient continued rehab as an outpatient and he progressed rapidly and in the 6 months period he was ambulating fully and independently without cane and absolutely pain free and he was praying on the chair without any aid.

DISCUSSION

In the last few years trend has been changed of doing bilateral knee arthroplasty as many authors demonstrated a higher rate of serious complications following bilateral procedures, whereas others have suggested no increase in the complication rate [5, 6]. But at the same time literature is also supporting bilateral knee artroplasty with its unique advantages in terms of reduced pain and increased function if patient is fit enough to tolerate this surgery [6]. As the literature is mostly covering the western world, the situation is quite different in the Asia and the Arab countries where social, religious and multiple other factors influence the patients decision to get definitive treatment regarding knee OA and the result is seen commonly as very challenging knee deformities which are uncommon in the west due to early referral and early treatment [9].

Patients knees due to OA usually develop severe varus deformities bilaterally, with loss of bone stock on the medial aspect of the tibial pleatue resulting on more varus deformities and severe ligamentous instabilities on lateral side on coronal planes [10]. These deformities are not easy to address and it needs careful preoperative planning and expertise to handle these issues. This is to emphasize on that we used revision implants only on the tibial side and almost never we used augmentation on the femoral side as tibial pleatue is always more damaged than the femoral condyles and this is due to multiple social and cultural factors as kneeling, squatting, floor sitting and socialization issues. Patients usually lose a lot of muscle power secondary to pain and instability and usually they are in the viscous circle of pain and disuse atrophy [11].

In this patient was given the option of bilateral knee arthroplasty as he was generally fit and he could sustain the surgery. He was highly motivated as he was being operated in a rehab facility and the deformity was of such extent that he could not get benefit of unilateral knee arthroplasty, so taking the advantage of rehab facility bilateral knee arthroplasty was done and excellent functional results were obtained.

Asian population are frequently presenting with severe deformities due to medial bone loss in tibia and due to that, they are not good ambulators and they have instability in their knees and if we do unilateral knee artroplasty due to the deformity and the weak quadriceps on the nonoperatic side. It is very difficult to ambulate them, as they still have another painful unstable and shorter knee and the operated knee will be straight, stable and longer and all deformities will be corrected. This will affect the rehab of the operated side.

For these patients, if we perform bilateral knee arthroplasty at the same setting, it has been observed that it's very easy to ambulate them, if pain has been controlled properly and the rehabilitation is also relatively easy and beneficial for them as both knees are being rehabilitated at the same time. We routinely use epidural anaesthesia for TKR for our patients and this epidural catheter is retained postoperatively for epidural analgesia for five days to facilitate in the early rehabilitation period.

These patients due to several factors which cloud their decision of taking medical treatment for their problem, usually declines the surgery for the non-operated side usually due to the fear of pain and continuous labour of rehab [12,13]. But these problems can be sorted out by proper counselling. It has been observed a few instanced that the patients have refused surgery for the other knee. These patients as they are usually presenting late and they have co morbidities also, so repeated anaesthesia's is also an issue, so if they are optimized preoperatively, bilateral knee artroplasty is a good option for these patients as it will save them from repeated anaesthesia's [13].

In general, Saudi population generally have a huge misconception of rehabilitation, they think that exercises is usually for the immediate post-operative period and after the surgery they have to do exercises for few months and as they have a new artificial joint they can carry on with it and this point has to be high lightened in their education that exercises especially quadriceps exercises is very important for them and they have to do it for the rest of their lives. And in this context doing a bilateral joint replacement surgery is very beneficial in rehab facility where they are taught all the exercises and a very condensed programme for rehab, to educate them and to carry out these exercises later on.

The general Saudi population commonly has a very high expectation of the outcome of surgery, having this belief that after surgery they will have a very good outcome, without keeping in mind that good outcome needs good preoperative conditioning of muscles and acceptable ROM prior to surgery. They usually not accept the limitations of surgery and they insist to go back on the same lifestyle as before the surgery bearing in mind

the fact that they have new joints. Bilateral joint replacement can meet their expectations as they are functionally very good in the late postoperative period providing they have good rehab management also.

In conclusion, bilateral total knee arthroplasty can be a very beneficial procedure, if the patient has been selected properly on the grounds of his general condition, experienced surgical and anaesthetic techniques and if this procedure is combined with proper rehabilitation. Excellent functional out comes can be achieved with rehabilitating both knees at the same time, especially the difficult and advanced arthritic knees.

REFERENCES

1. Clair, E.W. and T.F. Tedder, 2006. New prospects for autoimmune disease therapy: B cells on deathwatch. Arthritis Rheu., 54(1): 1-9.
2. Zeni, J.A., Jr and L. Snyder-Mackler, 2010. Clinical outcomes after simultaneous bilateral total knee arthroplasty: comparison to unilateral total knee arthroplasty and healthy controls. J Arthroplasty, 25(4): 541-6.
3. Abou-Raya, S., A. Abou-Raya and M. Helmii, 2012. Duloxetine for the management of pain in older adults with knee osteoarthritis: randomised placebo-controlled trial. Age Ageing., 41(5): 646-52.
4. Eckstein, F., C.K. Kwoh, R.M. Boudreau, Z. Wang, M.J. Hannon, S. Cotofana, M.I. Hudelmaier, W. Wirth, A. Guermazi, M.C. Nevitt, M.R. John and D.J. Hunter, 2012. Quantitative MRI measures of cartilage predict knee replacement: a case-control study from the Osteoarthritis Initiative. Ann Rheum Dis., 23. doi: 10.1136/annrheumdis-2011-201164.
5. Restrepo, C., J. Parvizi, T. Dietrich and T.A. Einhorn, 2007. Safety of simultaneous bilateral total knee arthroplasty. A meta-analysis. J. Bone. Joint. Surg. Am., 89(6): 1220-6.
6. Meehan, J.P., B. Danielsen, D.J. Tancredi, S. Kim, A.A. Jamali and R.H. White, 2011. A population-based comparison of the incidence of adverse outcomes after simultaneous-bilateral and staged-bilateral total knee arthroplasty. J. Bone. Joint Surg. Am., 93(23): 2203-13.
7. Barrett, J., J.A. Baron, E. Losina, J. Wright, N.N. Mahomed and J.N. Katz, 2006. Bilateral total knee replacement: staging and pulmonary embolism. J. Bone Joint Surg. Am., 88(10): 2146-51.
8. Haddad, S.L., J.C. Coetzee, R. Estok, K. Fahrbach, D. Banel and L. Nalysnyk, 2007. Intermediate and long-term outcomes of total ankle arthroplasty and ankle arthrodesis. A systematic review of the literature. J. Bone Joint Surg. Am., 89(9): 1899-905.
9. Font-Rodriguez, D.E., G.R. Scuderi and J.N. Insall, 1997. Survivorship of cemented total knee arthroplasty. Clin Orthop Relat Res., 345: 79-86.
10. Kao, F.C., K.Y. Hsu, Y.K. Tu and M.C. Chou, 2009. Surgical planning and procedures for difficult total knee arthroplasty. Orthopedics, 32(11): 810.
11. Bastiani, D., C.H. Ritzel, S.M. Bortoluzzi and M.A. Vaz, 2012. Work and power of the knee flexor and extensor muscles in patients with osteoarthritis and after total knee arthroplasty. Rev. Bras. Reumatol., 52(2): 195-202.
12. Lavernia, C.J., J.C. Alcerro and M.D. Rossi, 2010. Fear in arthroplasty surgery: the role of race. Clin Orthop Relat Res., 468(2): 547-54.
13. Ballantyne, P.J., M.A. Gignac and G.A. Hawker, 2007. A patient-centered perspective on surgery avoidance for hip or knee arthritis: lessons for the future. Arthritis Rheum., 57(1): 27-34.