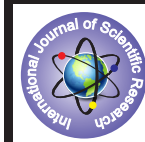


Comparative Results of Gender Knee with Standard High Flexion Joints



Medical Science

KEYWORDS : gender specific ,anterior knee pain , knee society score , hi flexion

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ABSTRACT

Women constitute majority of the patients with osteoarthritis. There are certain anatomical differences between both sex. Gender specific femoral implants are specifically contoured according to the female femoral surface and provide a better fit for the narrower female femur. This is a prospective study of 105 consecutive total knee replacements performed in 80 female patients using hi-flexion knee implants at our institute by a single operating surgeon. The patients were followed up for an average 1.3 years for gender hi-flexion knee with a maximum follow-up of 2.8 years. While for other hi-flexion knees average follow-up was 2 years with a maximum follow-up of 3.1 years. There was no statistically significant difference was found in terms of Knee Society Score , range of motion , anterior knee pain or complications. It is possible that gender-specific implants might have better outcomes for women. But to assess whether these implants have a clinically meaningful difference, studies are needed which compare these specialized prostheses with gender-neutral implants at longer follow-up duration.

Introduction:

Women constitute majority of the patients with osteoarthritis. Joint replacement is the gold standard treatment for patients with advanced osteoarthrosis of the knee who, despite appropriate medical management, have an unacceptable level of pain or physical function, or both. Surgeons traditionally have recognized the need to match the implant carefully to the distal femur and have often made intra-operative adjustments, including downsizing, upsizing, lateralizing and flexing of the femur to accommodate different femoral shapes in men and women.

Women have a higher Q angle presumably because of their wider hips and generally shorter femur. Femur tend to be narrower in women than in men and the distal femur in women tends to be trapezoidal in shape, whereas in men it is more rectangular. Such data prompted a market for gender express knee implants. These implants are designed to correlate to a woman's size and stature.

These gender specific femoral implants are specifically contoured according to the female femoral surface and provide a better fit for the narrower female femur. They prevent overhanging of the implants thereby supposedly reducing the incidence of anterior knee pain and irritation of soft-tissues. They provide better patellar tracking and improved extensor function. Our study aims to ascertain the advantages of these gender specific implants over standard hi-flexion joints.

Material and methods:

This is a prospective study of 105 consecutive total knee replacements performed in 80 female patients using hi-flexion knee implants at our institute by a single operating surgeon. 54 patients (71 knees) were operated for Gender hi-flexion knee (GSF – Zimmer) while 26 patients (34 knees) were operated for other hi-flexion knees which included Nexgen LPS-Flex (Zimmer), Scorpio Hiflex, Scorpio NRG and Exactech Hiflex (Optetrak) knees.

There was no criterion for choosing a particular implant and the selection of implant for a particular case was random. Clinical examination was done to ascertain alignment, deformity, instability, range of motion and extensor mechanism function. Scars and distal neuro-vascular status was assessed. Radiological recent weight-bearing anteroposterior, lateral and sky-line patella radiographs were taken. Mechanical axis was ascertained to determine the varus or valgus deformity of leg. Pre-operative templating was done to know approximate size of implants.

All the patients were operated under combined spinal and epidural anesthesia except 8 patients in whom spinal anesthesia was specifically contra-indicated.

We used the medial para-patellar approach in all cases. Standard operative technique for TKR was used. Patellar resurfacing was not done in any case. Patelloplasty was done by removing surrounding osteophytes, smoothing of surface using bone file, denervation by cauterizing the peripheral margin of patella and sub-chondral decompression by making multiple drill holes. We used thromboprophylaxis in the form of Fondaparinux or Enoxaparin in all cases, unless contraindicated, for three post-operative days. Intravenous antibiotics covering gram positive and negative organisms were given for three consecutive post-operative days.

Post-operatively foot-pump and static quadriceps were started as soon as the effect of anaesthesia wore off. Most of the patients were mobilized from first post-operative day after removal of drain. They were started range-of-motion exercises with quadriceps build-up.

Weight bearing was started from first post-operative day with support of walker, followed by stick from third to fourth post-operative day.

Patients were discharged on fifth post-operative day and were followed-up after 15 days for staple removal.

Then periodic follow-up visits were undertaken at 3 months, 6 months, 1 year and yearly thereafter.

Patients were assessed for clinical as well as radiological evaluation at every follow-up visit.

Results and Discussion:

This is a prospective study of 105 consecutive primary total knee replacements in 80 female patients, using hi-flexion knee implants. Out of these 55 were operated unilaterally while 25 were operated bilaterally.

Mean age of patient operated for gender hi-flexion knee was 59.4 years with a minimum of 35 years and maximum of 80 years. Mean age of patient operated for other hi-flexion knees was 65.9 years with a minimum of 47 and maximum of 73 years.

74 patients were operated for degenerative osteoarthritis of knee (92.6%). Other causes included rheumatoid arthritis leading to secondary osteoarthritis (6.1%) and post-traumatic secondary arthritis (1 case).

The patients were followed up for an average 1.3 years for gender hi-flexion knee with a maximum follow-up of 2.8 years. While for other hi-flexion knees average follow-up was 2 years with a maximum follow-up of 3.1 years.

Excluding one patient who died due to pulmonary embolism on 3rd post-operative day, we had 100 % survival of both gender as well as other hiflex knees. But this is of not much significance as the follow-up is a short one of 1-3 years. Short duration of follow-up is a major limiting factor of this study. Complications like osteolysis and loosening of implants are only seen over a longer duration of follow-up and are the most important reasons behind failure of implant and revision knee surgery.

Both the groups in our study showed significant increase in knee score as well as functional score from pre-operative to post-operative period. But the difference in average post-operative knee score was not significant in both groups, from 27 to 89 for Gender knee group and from 25 to 86 for other Hiflex knee group. Similarly, average functional score improvement was also similar for both groups, 78 from 33 for Gender knee group and 77 from 31 for other Hiflex knee group. However the differences between both groups in terms of improvement in knee scores and function scores was not found to be statistically significant using chi square test.

Post-operative range of motion achieved was average 135 degrees flexion for Gender knee group while 131 degrees for other Hiflex knee group. No significant difference was seen between the two groups.

It is important to note that 12 patients with reduced range of motion post-operatively (<120 deg flexion) were obese with a high thigh-calf index, and limb girth being a limiting factor for achieving full flexion rather than implant. Full functional flexion could be achieved in these cases.

Knee replacement provides a significant reduction in pain with the pain score according to knee society score improving from grade IV-VI pre-operatively to grade I-III post-operatively. It is gold standard treatment for osteoarthritis of knee. However improvement noted in knee score, functional outcome and decrease in pain is similar in both groups, with gender knee system not providing any significant benefit.

The incidence of Grade I (mild) anterior knee pain requiring occasional analgesics was 25 % for Gender knee and 26.4 % for

other Hiflex knees in this study. The incidence of Grade II anterior knee pain is only 1% for both groups. In no case we had to undergo revision surgery due to patellar problem or anterior knee pain.

There were 4 patients who had Gender knee replacement on one limb and Nexgen LPS-flex knee on the other. In these group of patients it was observed that range of maximum flexion achieved was slightly better on the side operated with Gender knee (134 deg) than on that operated for Nexgen LPS-flex knee (128 deg). Also the incidence of anterior knee pain was less on the side operated with gender knee and had faster rehabilitation with better quadriceps function. But this group of patients is too small to obtain significant results.

The complication rate in our study is very less. Infection rate was only 0.9%. There was only one case of patellar mal-tracking with pain and difficulty in walking, who required patellar realignment procedure with lateral retinaculum release and medial plication. This patient was operated with Exactech Hiflex knee.

There was one death due to pulmonary embolism in Gender knee group. No case of osteolysis or loosening was seen. But the follow-up of this study is too short to comment on this. No case of peri-prosthetic fracture was seen. No case of patellar fracture or patellar ligament injury was seen.

It is possible that gender-specific implants might have better outcomes for women. To assess whether these implants have a clinically meaningful difference, studies are needed which compare these specialized prostheses with gender-neutral implants at longer follow-up duration.

Conclusion:

In short term follow up result of gender knee with specific knee are not significantly different from standard high flexion joints. To assess whether gender specific implants have a clinically meaningful difference on long term, studies are needed which compare these specialized prostheses with gender-neutral implants for longer follow up

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