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**Dr. Sushant Ghumare**  
Fellow, Arthroplasty  
Shalby Hospitals, Ahmedabad,  
Gujarat, India

## Total knee replacement in a patient with quadriceps paresis secondary to polio: A case report

**Dr. Sushant Ghumare**

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### Abstract

Poliomyelitis has created devastating complications and altered the physical, socioeconomic lives of patients suffering from it. Commonly it causes flaccid paresis or paralysis. Osteoarthritis can develop in knees of these patients over the years.

Generally absent Quadriceps function is contraindication for total knee replacement. Here, we describe a case of middle aged female patient who underwent knee replacement using hinged implant for severe osteoarthritis of knee joint. At 6 month follow up patient reported excellent painless mobility.

**Keywords:** TKR- total knee replacement, RHK- rotating hinged knee, PS- posterior stabilised

### Introduction

#### Case

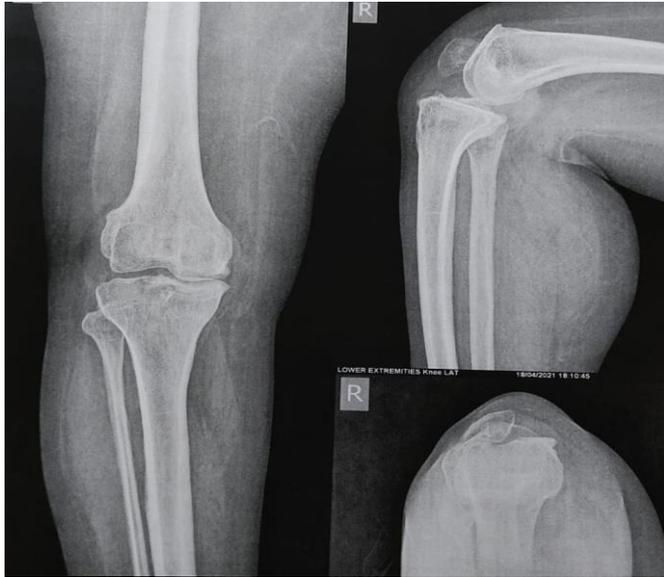
A 38 years old female, housewife by occupation residing came to us with chief complain of pain in right knee and difficulty in walking since 3 years. Pain was insidious in onset, gradually progressive. Pain is mechanical i.e. it exacerbates on activity and relieved on rest. it has no diurnal variation. Constant pain affected her activities of daily living. She was suffering from polio in bilateral lower limbs since childhood. She had no other medical co-morbidity. On examination of right knee, skin was normal. There was no scar, sinuses, swelling.. Gross wasting of quadriceps on right thigh Patellar grinding test was positive, crepitus present. Medial and lateral Joint line tenderness were present. Range of motion of right knee was from 10 degrees of hyperextension to 90 degrees of flexion (active) further flexion upto 120 degree (passive). Varus was 15 degrees. Active straight leg raising test was negative. Quadriceps power was 2/5. Varus stress test was positive. All distal pulsations were present. Hip examination was normal.

After routine investigations, she was taken for the surgery under spinal anesthesia. Routine anterior midline approach were used for knee arthroplasty. Medial parapatellar arthrotomy and medial release was done. Tibia dislocated anteriorly and tibia cut taken using saw drill and zig. Tibial canal drilled upto size 13 for stem insertion. Femoral preparation done using distal cutting block with valgus 6 degrees and 6mm distal cut as patient is having tendency to lock knee in hyperextension for walking. Femoral sizing done all cuts taken. Femoral canal reamed upto size 15 for stem insertion. Instrument system used was zimmer –rotating hinged knee (RHK). After trial and satisfactory alignment, constrained liner used which prevents hyperextension and mediolateral laxity. Patellar tracking checked which required lateral release. Final step of cementing done successfully with thorough saline wash. All movements checked on table and knee found to be stable.



**Fig 1:** Hyperextension of knee

**Corresponding Author:**  
**Dr. Sushant Ghumare**  
Fellow, Arthroplasty  
Shalby Hospitals, Ahmedabad,  
Gujarat, India

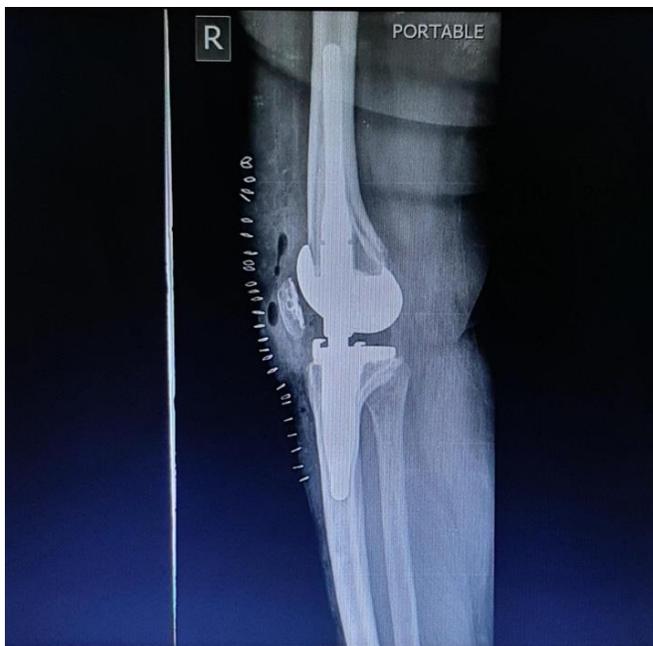


**Fig 2: Pre-op Xray**



**Fig 3: Varus deformity of Right knee**

**Outcome & Follow Up**



**Fig 4: Post-op Xray**



**Fig 5: Follow up at 3 months with no deformity**

Weight bearing with the help of a walker was started from day one of postoperative period. Walker was discontinued after 2 weeks, and she started using stick. The stick was used

for 1 month of postoperative period. She underwent daily physiotherapy for 1 month which includes ankle toe movements, static and dynamic quadriceps strengthening, and hamstring strengthening exercises. She was followed up at 2 weeks, 6 weeks, 3 months and 6 months postoperatively. She has gained good range of motion i.e. from 0 to 90 degrees without any pain and laxity.

**Discussion**

TKR is a challenging procedure in limbs affected with poliomyelitis, it requires experience and technical expertise. These patients have tendency to lock knees in hyperextension and walk as they have diminished quadriceps strength. They also have problems like poor bone stock, valgus knee, and ligamentous laxity. Surgeon have to keep in mind all these while operating the case.

In some studies [1-3] Conventional PS condylar designs were used using intra-op techniques like less distal femoral resection, less tibia cut, large insert, gap balancing to overcome hyperextension. But results were not satisfactory

because majority patients develop hyperextension post – operatively and they were later revised with constrained implant. Use of constrained implants in such cases is debatable as constrained implants lead to more stress on implant bone interface and lead to early failure. Tigani *et al.* [4] had justified that modern day implants with RHK designs mimics normal kinematics of knee with reduced stress on implant bone interface.

In one study [5], it suggested that if quadriceps power is less than antigravity strength ( $<3/5$ ), Results with hinged design are better than conventional design.

### Conclusion

Use of modern RHK design- implants is the key while treating such patients. Total knee replacement alleviates pain and functional limitations of patients with knee arthritis along with poliomyelitis. These patients already have suffered a lot physically and mentally due to polio since younger age. TKR can alleviate their pain, social, functional limitation to a extent where they can live normal life. Quadriceps power is also a important prognostic factor. Patient should be counseled pre-operatively. Use of constrained implant preferably rotating hinge is recommended if power of quadriceps is less than 3. Soft tissue handling, ligament balancing, proper cementing, limb alignment is must and has no other alternative irrespective of implant used.

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