



## THE STUDY OF SHORT TERM FUNCTIONAL OUTCOME IN CHARCOT'S KNEE PATIENTS WHO UNDERWENT TOTAL KNEE REPLACEMENT: A CASE SERIES

### Orthopaedics

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### ABSTRACT

**Background :** Charcot's knee was considered as a contraindication for total knee replacement earlier. Nowadays, there is adequate evidences in the literature that for suitable patients, total knee arthroplasty can be used as a effective tool in case of charcot's arthropathy. **Methodology:** Two individuals-one male and one female of different age groups with different treatment history of charcot's knee are analysed. 70year old male and 50year with knee deformity underwent total knee replacement. After the post-operative mobilization, functional outcomes were assessed and serially monitored for 1.5 years. The functional assessment were done using the lower extremity functional scale scoring system. **Results:** Charcot's osteoarthropathy of knee joint develop due to repetitive micro trauma to the knee joint following sensory impairment resulting from insult to spinal cord, sequelae of neurosyphilis. Following Total knee replacement, painless mobilization of the limb is achieved with improved range of movements of knee joint with better functional status of the patient. **Conclusion:** Total knee arthroplasty found to be a superior modality of treatment in cases of charcot's knee joint with good postoperative functional outcomes

### KEYWORDS

Charcot's arthropathy, latent syphilis, total knee replacement

### INTRODUCTION

Neuropathic joint, although first described by Charcot in tabes dorsalis in 1868, has subsequently been observed in a variety of conditions including syringomyelia, diabetes mellitus and peripheral nerve disorders. There is a progressive disorganisation of architecture in the insensitive joint, leading to painless joint swellings with radiologic evidence of pronounced bone destruction as well as new bone formation in abnormal sites. The basic factor seems to be lack of appropriate sensory input from the joint. Abolition of proprioceptive and/or sensory impulses from the joint leads to it being exposed to unusual trauma for a prolonged time. Repetitive trauma leads to fibrillation and fragmentation of the joint cartilage resulting in the so-called loose bodies. The joint capsule is often stretched beyond tolerance both by the hemarthrosis and by the stresses on the joint. In addition, there is hyperemic bone resorption and softening and the resultant atrophic bone is easily traumatized. The result is a vicious circle which may go on until the joint is totally destroyed. Charcot's knee is a rare presentation. The treatment modalities are use of braces, calipers, corset and finally arthrodesis with limited success<sup>2</sup>. But in recent literature, there are studies supporting total knee replacement for charcot's knee patients. Total knee arthroplasty may be offered to a select group of patients with end-stage neuropathic arthropathy. The basic principles of knee arthroplasty in restoring limb alignment, reinforcing bony defects by bone grafting or augmented prostheses, careful ligamentous balancing, and appropriate selection of constrained prostheses particularly are important in these patients<sup>1</sup>

### Methodology

Two individuals-one male and one female of different age groups with different treatment history are analysed. These patients presented to the out patient department of department of orthopedics of Government medical college Kottayam. 70year old male with late latent syphilis presented with wind swept deformity of the knees treated by bilateral total knee replacement in two stages. 50year old female presented with swelling, valgus deformity of left knee developed secondary conus/epiconus spinal cord injury 19 years back underwent total knee replacement of left knee. After the post-operative mobilization, functional outcomes were assessed and serially monitored upto to a period of 1.5 years. The functional assessment were done using the lower extremity functional scale scoring system (LEFS)<sup>7</sup>. It consists of 20 number of day today activities, each activity having scores ranging from 0 to 4. Total score is 80. Higher the score better the functional outcome.

### Ethical Consideration

1. Ethics committee approval was taken before starting the study.

2. Written informed consent was taken from subjects
3. Confidentiality of the information obtained was assured throughout the study.

### DISCUSSION

#### Case :1

A 70 year old male presented with painless deformity of both lowerlimbs and difficulty in locomotion. The deformity was windswept deformity of both lowerlimbs. On further evaluation, radiology suggests gross destruction of both knee joints, new bone formation. MRI spine was done which showed only multiple level disc bulges. Blood investigations showed normal results including blood sugar levels. CSF study showed TPHA (Treponema pallidum hemagglutination assay) positivity. NCS (nerve conduction study) study of lower limbs showed decreased amplitude in CMAP. Other systemic evaluation done to ruleout signs of syphilis. Finally diagnosed as late latent syphilis.



**Fig. 1:**Preoperative image of case 1



**Fig. 2:**Preoperative x-ray of case 1

He underwent two staged total knee arthroplasty and postoperatively showed deformity correction, good range of movements of knee and mobilization.



**Fig. 3:** Followup correction achieved

**Fig. 4:** Postoperative Xray of right knee of Case1

**Fig. 5:** Postoperative Xray of Left knee of Case1

### Case :2

A 54 year old female, known diabetic presented with valgus deformity of left knee and difficulty in locomotion. She had a history of weakness and sensory loss of whole left lowerlimb 19 years back following spinal anesthesia for LSCS. MRI spine showed epiconus and hemiconus hyperintensity.



**Fig.6** Preoperative image of case 2

**Fig. 7:** Preoperative x-ray of case 2

She underwent hinged total knee arthroplasty. Postoperatively she has improved range of movements of left knee and better functional status



**Fig. 8:** Postoperative clinical image of case 2

**Fig. 9:** Postoperative x-ray of case 2

## RESULTS

**Table 1: Analysis of functional outcome of case 1 and case2**

	CASE-1	CASE-2
CAUSE	LATE LATENT SYPHILIS	SECONDARY TO SPINAL INJURY
LEFS (postoperative value)	42/80	58/80
RANGE OF MOVEMENTS	0° TO 120° FLEXION /EXT	0° TO 100° FLEXION/EXT
SIGNS OF INFECTION	NIL	NIL
DEFORMITY	CORRECTED	CORRECTED
STABILITY	PRESENT	PRESENT

\*LEFS-Lower extremity functional scale score

Charcot's knee joint is a rare presentation. During initial days, conservative treatment with orthosis, total contact casting, arthrodesis, amputation were the options. Arthroplasty was considered as a relative contraindication for charcot's knee.

Case-1 and case-2 underwent TKA of knee joint following which deformity was corrected. No signs of infection. Improved range of movements of the joint. Better lower extremity functional scale score which denotes better activities of daily living.

LEFS of case 1 was improved drastically from 10(preoperative) to 42(postoperative value) and that of case 2 from 16 to 58. Conclusion may be drawn as total knee arthroplasty found to be a superior modality of treatment in these two cases of charcot's knee joints with good postoperative functional outcomes.

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### Declarations

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**Conflict of interest:** None declared

**Ethical approval:** Yes, obtained

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