

## Original Research Article

# Short term analysis of the functional outcome in complex primary hip arthroplasty

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## ABSTRACT

**Background:** Total hip arthroplasty is the most commonly performed reconstructive procedure that replaces the femoral head, neck and acetabular articular surface. THA is a highly successful procedure that has made numerous patients return to excellent function without pain and provides a stable, pain-free mobile joint. The purpose of this study is short term analysis (retrospective and prospective study) of the functional outcome in 30 patients who underwent complex primary hip arthroplasty.

**Methods:** A retrospective and prospective study was done to evaluate the functional outcome in 30 patients who underwent complex primary total hip replacement and to analyze the results. A detailed clinical examination and radiological assessment was done to assess the nature of deformity, bone stock, functional impairment and component sizes. Pre-operative templating is routinely done in all cases. Pre-operative clinical evaluation was done using modified Harris hip scoring.

**Results:** Most of the patient was operated by Hardinge lateral approach (22 Patients). 8 patients were operated by Posterior Southern-Moore approach. In our study the average surgical time delay was 6 days ranging from 5 to 17 days. The average surgical time was 120 minutes ranging from 60 minutes to 3 hours.

**Conclusions:** The surgical technique employed is unique to each complex case. Surgeon expertise is also a must to deal with complex hips. Complex primary THA is an emerging trend with better clinical and functional outcome with the presently available modular implants and improved surgical techniques.

**Keywords:** Total hip arthroplasty, Complex primary hip arthroplasty, Dysplasia hip ankylosed hip, Protrusio acetabuli

## INTRODUCTION

In human body, the hip joints bear the great responsibility of transmitting the ground reaction force against the body weight and simultaneously preserving the mobility. Any disease/trauma involving hips primarily affects locomotion, disables the Individual's activity of daily living.<sup>1</sup> Patients with painful hips require complete evaluation with standard x-rays, computed tomogram (CT) and if necessary magnetic resonance imaging (MRI) to conclude the diagnosis. The treatment protocols for

painful hips include analgesics, walking stick, axillary crutches, arthrodesis, osteotomy, excision arthroplasty and total hip arthroplasty (THA).<sup>2</sup> Total hip arthroplasty is the most commonly performed Reconstructive procedure that replaces the femoral head, neck and acetabular articular surface. THA is a highly successful procedure that has made numerous patients return to excellent function without pain and provides a stable, pain-free mobile joint. THA demands accurate surgical technique to reproduce a biomechanically sound joint.<sup>3</sup> Primary THA is indicated in clinical conditions like

primary osteoarthritis, inflammatory arthritis (without complications), and secondary osteoarthritis (Perthes disease, avascular necrosis). With the evolution surgical techniques and Instrumentation, the clinical indications for THA has been expanded to include patients who were previously considered not eligible for THA.<sup>4</sup> Such Complex indications include dysplastic hips, protrusion acetabuli, ankylosed hips, neuromuscular disorders, failed osteosynthesis (previous bony procedures around hip), skeletal dysplasia and severe soft tissue contractures around hip. The surgical techniques employed to restore the normal centre of rotation of the hip joint in complex cases are unique to each case. The assessment of outcome of surgical procedure in complex cases is done by modified Harris hip scoring.<sup>5</sup> This study is a retrospective and prospective short term analysis of functional outcome in patients who underwent primary THA for complex cases.

## METHODS

A retrospective and prospective study was done to evaluate the functional outcome in 30 patients who underwent complex primary Total hip replacement and to analyze the results. The study group consists of 30 Patients who underwent complex primary total hip replacement between January 2016 and December 2017 at the Department of Orthopaedics, Government Dharmapuri Medical College and Hospital, The study was done with clearance from hospital ethical committee.

Those who fulfilled the inclusion criteria given below were invited to participate in the study. Informed consent was obtained from all the patients willing to take part in the study.

### Inclusion criteria

Inclusion criteria were developmental dysplasia hip; ankylosed hip; protrusioacetabuli; failed osteosynthesis (SED, epiphyseal dysplasia); neuromuscular disorders (polio, Down's syndrome, cerebral palsy, stroke); prior hip fractures (acetabular fractures); severe soft tissue contractures around hip.

### Exclusion criteria

Exclusion criteria were primary osteoarthritis hip; inflammatory arthritis without complications; secondary arthritis (vascular necrosis, Perthes disease) the recording of data begins on admission of patient and continues for 2 years postoperatively.

The protocol for our study is pre-operative clinical proforma, pre-operative X-ray pelvis with both hips- AP and lateral view, special views postoperative X-rays monthly follow up for 1<sup>st</sup> 4 months, once in 6 months up to 2 years and yearly thereafter. A detailed clinical examination and radiological assessment was done to

assess the nature of deformity, bone stock, functional impairment and component sizes.<sup>1</sup> Pre-operative templating is routinely done in all cases. Pre-operative clinical evaluation was done using Modified Harris Hip Scoring. Appropriate tables and graphical representations were used to display the data. Chi-square test was used. A "p" value <0.05 was taken as significant.

## RESULTS

The mean age of the patients was 38 years ranging from 20 to 65 years? Nearly 27% patients belong to 3rd decade followed by 4th decade (40%). 87% of the patients belong to less than 50 years. Males dominated our study group with a ratio of 2: 1.

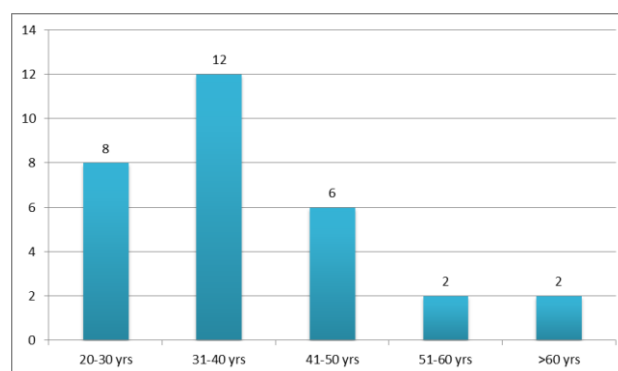


Figure 1: Shows the age incidence among patients.

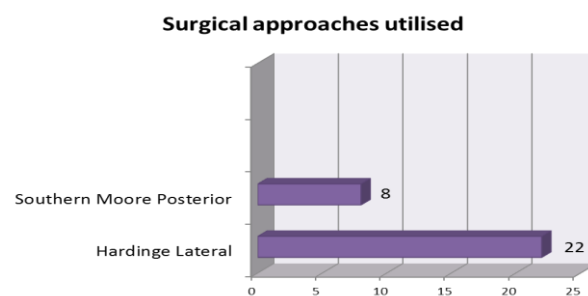


Figure 2: Shows surgical approach utilised.

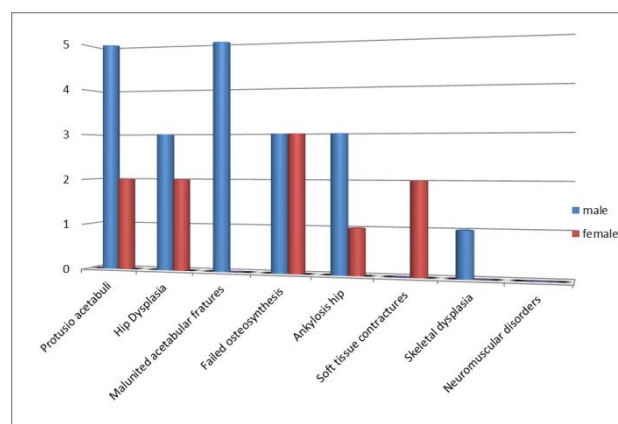
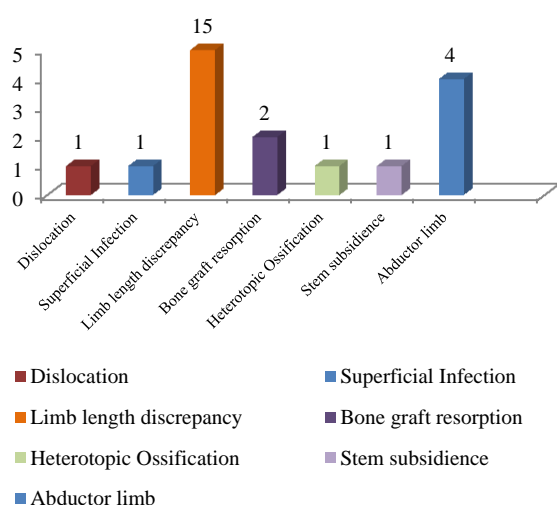


Figure 3: Complexes of hip fracture categories.

Most of the patient was operated by Hardinge lateral approach (22 patients). 8 patients were operated by Posterior Southern-Moore approach. In our study the average surgical time delay was 6 days ranging from 5 to 17 days. The average surgical time was 120 minutes ranging from 60 minutes to 3 hours.

Complications encountered in our study were hip dislocation, superficial infection, limb length discrepancy, acetabular bone graft resorption, heterotopic ossification and subsidence of femoral stem (uncommented). One patient dislocated in the immediate post-operative period; which was reduced instantly under anaesthesia by traction and abduction.



**Figure 4: Shows the surgical complications among patients.**

One patient developed superficial infection treated with broad-spectrum antibiotic 3<sup>rd</sup> generation cephalosporin ceftriaxone with amikacin and metronidazole. Patient recovered in 5 days with well healed wound. 15 patients developed limb length discrepancies averaging 0.9cm (ranging from 0.5 cm to 1.5 cm). Some patients were treated conservatively while others were treated by heel and sole rise. Two patients had acetabular bone graft resorption. One patient was diagnosed with heterotopic ossification that was treated with Indomethacin 75 mg OD for 6 weeks. One patient developed Subsidence of femoral stem (uncommented) which required revision of Femoral stem alone. Our follow up ranges from a minimum of a month to a maximum of 4 years averaging 24 months.

## DISCUSSION

The surgical techniques used in the complex primary THA to restore the anatomical hip joint centre, has given satisfactory results which is comparable with literature worldwide. In our series of 30 cases, 22 were operated using Harding lateral approach and 8 cases were done

with posterior approach. Our study showed lateral approach to be superior without complications and a case of postoperative dislocation in a patient operated through posterior approach. On dissecting our case study, the 7 cases of protrusio acetabuli, 5 cases of hip dysplasia, 6 cases of failed osteosynthesis, 2 cases of soft tissue contractures and 1 case of Skeletal dysplasia's went on uneventfully with good outcome with excellent and good result. In our study, all cases were template preoperatively on standard 100% magnified AP X-ray. Templating reduced the operative time, widened the idea on various implant choices (required in complex hips), restored the anatomical hip joint centre and finally reduced the complication. In our series of soft tissue contractures 2 cases, both underwent uncommented THA and postoperatively uneventful with excellent to good results. A study conducted by Chiavetta et al, proved that series of protrusion acetabuli 7 cases, 6 were treated with morcellized bone grafting (impaction grafting) and one was treated with anti-protrusion cages.<sup>6</sup> Hamadouche et al, from there study showed that using Harris hip score gave 25% good, 50% fair and 25% worse results which is disastrous when compared. The irksome complications were femoral stem subsidence, limb length discrepancies and heterotopic ossification.<sup>7</sup> Hardinge et al stated that Extensive soft tissue release in the order of capsule, iliopsoas, iliotibial band and gluteus maximums for a better result.<sup>8</sup> Our study results using Harris hip score gave 100% excellent results when compared to results worldwide. Our patients had an improved quality of life with good functional outcome and better social and economic productivity.

## CONCLUSION

The primary total hip arthroplasty has revolutionized the treatment of hip joint disorders in the past 3 decades. The indications for the primary THA has been extended to complex hip pathologies which were previously considered ineligible for the procedure. Such complex hip cases fall into the categories of developmental dysplasia hip, enclosed hip, protrusio acetabuli, failed osteosynthesis (previous bony procedures around hip), skeletal dysplasia (SED, epiphyseal dysplasia), Neuromuscular disorders (polio, down's syndrome, cerebral palsy, stroke), prior hip fractures (acetabular fractures), severe soft tissue contractures around hip and post excision arthroplasty hip. The management of these complex hips with altered bony and soft tissue anatomy is challenging with the conventionally available total hip instruments and implants. With the advent of new surgical techniques, implants and instruments, the primary THA in complex hips has given good excellent results which is comparable with the results published worldwide.

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*Ethical approval: The study was approved by the institutional ethics committee*

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