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OUTCOME OF LEFT DYSPLASTIC HIP CROWE TYPE IV TOTAL HIP:CASE REPORT

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ABSTRACT:

BACKGROUND:

Congenital hip dysplasia can result in significant acetabular and femoral deformities, making total hip arthroplasty a complex and challenging procedure [1]. Congenital hip dysplasia (Development Hip Dysplasia) involves development of the hip joint, leading to structural abnormalities in both the acetabulum and femur [1].Implanting conventional cemented or cementless femoral components in the narrow femoral canal can be challenging and often requires minor version adjustments during surgery [3].Because of these morphological characteristics,the treatment option for Left Dysplastic Hip Crowe Type IV Total Hip Replacement. We herein will discuss the important points in this surgery, such as the approach, selection of the femoral implant, clinical results and postoperative outcomes [8]. 37 YRS Male patient presented to OPD with complaints of pain in left hip and difficulty in walking for 6 years. The patient had history of congenital dysplasia of left hip along with history of Septic Arthritis for which he undergone treatment of incision and drainage. X Ray of Pelvis with both the hips shows fibrosed deformed femoral head with the short nek and narrow femoral canal with arthritic changes in acetabulum. We underwent Total Hip Replacement using tapered cone stem without undergoing subtrochanteric osteotomy. Post operatively assessment of patients had good range of motion along with no difficulty in walking and weight bearing. The functional outcome is rated as excellent based on the Harris Hip Score.The tapered stem ensures stability and proper implant orientation, even in a dysplastic femur. Given its favourable long-term outcomes, it is a viable option for Total Hip Arthroplasty in a developmental hip dysplasia, including in young patients. Achieving the anatomical centre of rotation as accurately as possible was linked to improve functional outcomes.Further follow-up was done to confirm whether these results were maintained over a longer term or not.[6]

BACKGROUND:

Congenital hip dysplasia or developmental hip dysplasia is a condition characterised by abnormal development of the hip joint, affecting both the acetabulum and the femur. If not diagnosed and treated early in childhood, it can result in functional limitations in young adults. The acetabulum typically has reduced depth with a deficiency in the superior

portion,while the femur often shows a deformed head, a shortened neck with excessive anteversion, and an unusually shaped medullary canal.The femur's medial-lateral diameter is smaller compared to the antero-posterior diameter, and the greater trochanter is commonly positioned more posteriorly [1]. Developmental Hip Dysplasia in adults presents with unique challenges due to its characteristic's pathological anatomy, early symptom onset degenerative joint changes and the relatively young age of affected patients. Treatment options, including acetabular reconstructions, femoral osteotomies and joint arthroplasty have been proposed over the years. The anatomical alterations make the selection of the prosthesis and the implant technically demanding. Moreover, previous surgeries, such as femoral osteotomies and acetabuloplasty, can significantly increase the difficulty of joint replacement. Finally, relatively young age of the patients highlights the problem of the long-term survival of the implants.[1]

A study assessing patients with the developmental hip dysplasia treated with total hip arthroplasty using a cementless tapered stem reported favourable long-term results. The tapered stem allowed adequate stability in orientation of the implant, even in dysplastic femurs. This suggest that the cementless tapered stem may be suitable option for total hip arthroplasty in developmental hip dysplasia, even in young patients, Total hip arthroplasty using a cementless tapered stem has a favourable long-term results in patients with developmental hip dysplasia Crowe type IV, the treatment approach should be individualized, considering the patient's age ,previous surgeries and the specific anatomical alterations present[6].

CASE REPORT:

The patient's name Kanhaiya Kumar,37 years, male, sweet shop owner by occupation came to OPD with chief complaints of limping walk since childhood with pain in left hip and difficulty in walking, squatting and cross leg sitting since last 6 years. There was no associations of any trauma, fever, night sweats, weight loss or morning stiffness. Patient has no history of asthma, diabetes and hypertension. Patient has history of tobacco and alcohol consumption since past 10-15years. Local examination shows sign of flexion adduction and internal rotation attitude with patient walking bipedal without support and having Trendelenburg gait. The left ASIS is higher compared to right with lurching towards right side. The movements of left hip were restricted in all the planes with no axis deviation. The left side limb was shortened compared to right with true length discrepancy of around 8cm

and apparent length discrepancy of about 6cm. There was also supratrochanteric shortening as confirmed by Bryant's triangle, Nelaton's line. The X-RAY view of bilateral hip with pelvis AP View show sign of shallow acetabulum, pseudoacetabulum, subchondral sclerosis, deformed femoral head,reduced jointspace,over-riding of Greater Trochanter, narrow femoral canal [Figure].

After clinical examination and investigations, diagnosis of DDH in left hip in the patient was done and Total Hip Replacement of left hip was planned. After PAC was done, patient shifted to modular OT and Lateral Approach Total Hip Replacement was done. [Figure 2]
TFL split deep intramuscular plane made between gluteus minimus and gluteus medius. T-shaped incision over the capsule was given with head dislocation. Femoral neck cut is done 1-finger proximal to lesser trochanter at 45-degree angle. Bony osteophytes [figure 4] rimming of acetabulum adjacent to medial wall of pelvis to maximize bone coverage appropriate size angulation and anteversion angle was done. The uncemented femoral component with a 135-degree angle, size 9mm and a 36mm head was successfully implanted. Post- implantation, the hip joint was assessed for movement in all planes and limb length was verified to ensure no discrepancy. The wound was closed in layers and an abduction bar was provided to the patient to prevent dislocation.

POST – OPERATIVE:

Post operatively the patient was prescribed antibiotics analgesic and anti-plateletsmedications. Ambulation with walker POD 3 along with quadriceps and hip abductor strengthening exercises. A post operative x ray was done on POD 1. Range of motion exercises were initiated on POD 5 and suture removal was completed on POD 15. At 3 months of follow up the patient reported no pain and difficulty in walking. Hip range of motion was satisfactorily, and the functional outcome was deemed good based on Hariss hip score

This case report was conducted at Rama medical college and hospital after obtaining approval from the institutional ethics committee. Informed written consent was obtained from the patient in their native language and potential post operative complications were thoroughly explained

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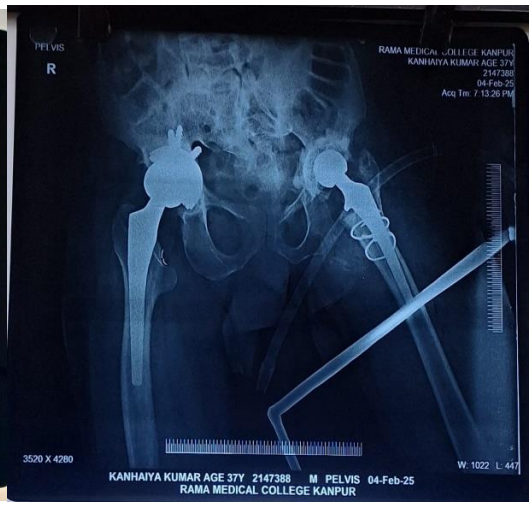

[Figure 1] Pre-op X-Ray of B/L Hip AP View **[Figure 2] Post-op X-Ray of B/L Hip AP View**

[Figure 3] Shows Superficial incision

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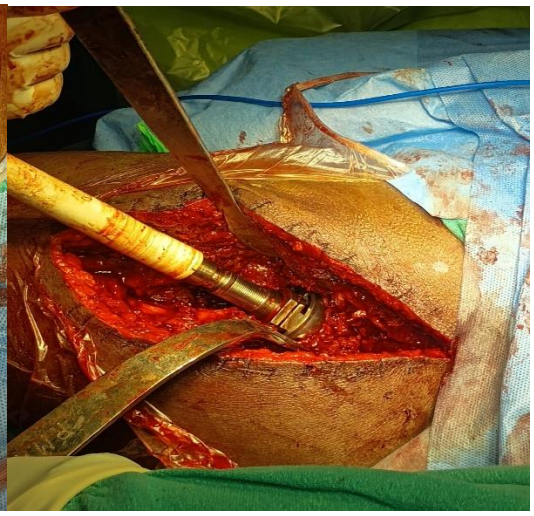
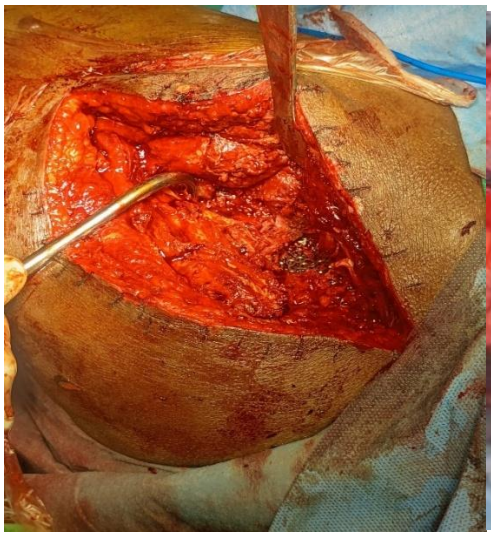
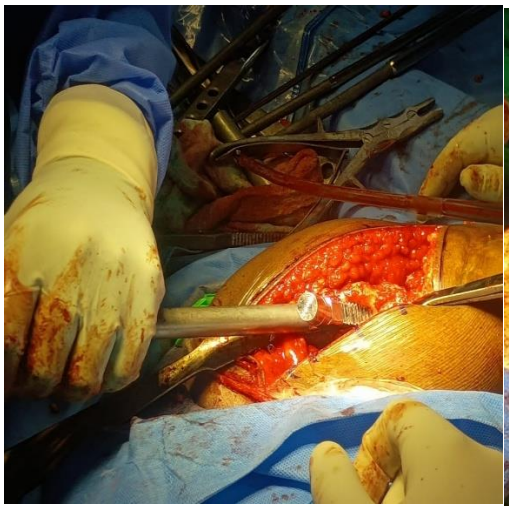


[Figure 4] Removal of osteophytes[Figure 5] Rimming of acetabulum




[Figure 6] Cage Fixation [Figure 7]Acetabulum component

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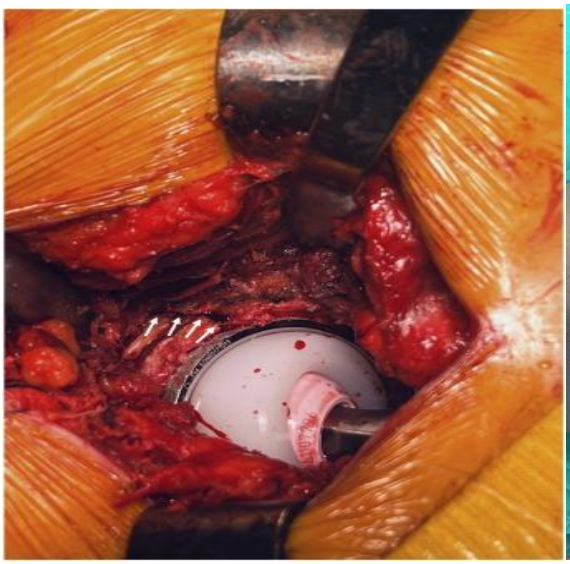
[Figure 8] Broaching of femoral canal [Figure 9] Femoral component insertion


[Figure 10] Tying of femoral stem component [Figure 11] Shows Head component




[Figure12] Reduction of head acetabular cuff [Figure 13] Showing post-op suture

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DISCUSSION:

Hip dislocation is a frequent occurrence in Developmental Dysplasia of Hip. A large femoral head size has been shown to reduce the risk of dislocation. Wang et al. reported a dislocation rate of 2.93% (24 out of 820 hips) in patients with developmental dysplasia of hip [10]. A large femoral head size was associated with a lower dislocation rate, with 1.3% (7 out of 535) in heads smaller than 28mm and 0.5% (2 out of 375) in heads 28mm or larger. In our case, the femoral head was not well developed and fibrosed. The risk of hip dislocation is also affected by the combined anteversion angle. Akiyama et al. reported that femoral anteversion in developmental dysplasia of hip ranged from 13.2degree to 58.2degree, showing a significantly broader distribution compared to normal hips [11]Hip dislocation is also influenced by V-COR with each 5mm increase raising the dislocation risk by 3.1 times,. Kaneuji et al. reported a mean V-COR of 26.8+-4.8 mm (range v:20-35.9mm) with no acetabular failures observed at a 15 year follow up[12].Murayamaet al. demonstrated that clinical and radiographic outcomes were excellent when placement was less than 35mm from the inter-teardrop line[13].Significant age-related changes include alterations in pelvic inclination, progressive bone quality deterioration and muscle volume reduction. These age-related changes may increase the risk of dislocation after total hip arthroplasty (THA). Hip dislocation is also influenced by the Crowe classification. Cameron et al. reported that a higher Crowe grade is associated with an increased risk of complications including nerve palsy, infection and dislocation. The Crowe classification helps predict surgical complexity with higher grades correlating with a greater likelihood of complications[13].In our case, the it is Crowe Type IV.A higher hip center provides greater bone coverage but reduces flexion and internal rotation.In patients with Crowe II and III hip dysplasia elevating the hip center is necessary to achieve adequate bone coverage[14]In our case range of flexion was 20 to 100 degrees., and internal rotation 10 to 30 degrees.

CONCLUSION:

Risk factors for dislocation after high hip center THA for DDH are high hip center >23.9, advanced age, high grade as per Crowe classification, and femoral head size. The higher hip center gained more bone coverage but decreased the range of flexion and IR.

DECLARATIONS:

Ethics approval and consent to participate: This is a case report study done at RAMA MEDICAL COLLEGE HOSPITAL after securing due approval from the institutional ethical committee. Informed written consent was taken from the patient in his own language and the post op complication was explained to the patient.

Consent for publication: Consent for publication of clinical details and images of the patient taken. **Availability of data and material:** Not applicable.

Competing interest: No financial and non-financial competing interest. Funding: No funding was obtained for this study.

Author contribution: HP helped in relevant literature search. SKS wrote initial draft. SKS and SS contributedin drafting of the manuscript. All authors have read and approved the final manuscript. **Acknowledgement:** The authors offer thanks to the patient who participated in this case report study.

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