

# Treatment Evaluation for Developmental Dysplasia of Hip Joint in Young Adults

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## ABSTRACT

**Background:** Developmental dysplasia of the hip is a crucial condition of hip joint demobilizing the patient. If left untreated can cripple and cause premature arthritis at adulthood.

**Objective:** To assess and compare the various methods of treatment, for patients suffering from developmental dysplasia of hip joint.

**Study Design:** Prospective study

**Place and Duration of Study:** Department of Orthopaedic, Sahara Medical College, Narowal from 1<sup>st</sup> July 2019 to 31<sup>st</sup> December 2020.

**Methodology:** Forty five patients between 20-37 years of age were enrolled in the study having developmental dysplasia of hip. After complete radiological, physical and clinical examination the diagnosis of developmental dysplasia of hip joint was made. Demographic information was taken on well structured questionnaire. In a cohort study design patient were divided into three groups in accordance with their administered surgical protocol post their consent. Each group had 15 cases. Three various surgical procedures were performed keeping complete quality performance and recovery was followed up to six months of time.

**Results:** The mean age was 33±1.2 years. The maximum number of patients was admitted between 26-31 years of age. A total of 45 patients were admitted (46 hips). Within which 35 patients (77.7%) were females and 5 (22.3%) were males. There were 27 hip having developmental dysplasia of hip joint at left side including one with be the left and right side involved. 94.1% treatment success rate of periacetabular osteotomy followed by hip arthroscopy.

**Conclusion:** Periacetabular osteotomy is best surgical procedure for developmental dysplasia of hip in young adults.

**Key words:** Developmental dysplasia, Hip joint, Treatment, Dislocation

## INTRODUCTION

In accordance to various clinical or radiological definition of developmental dysplasia of hip (DDH) almost 1-2% of neonates are effected from its worldwide.<sup>1,2</sup> Developmental dysplasia of hip has been documented Hippocrates time. Regardless of advancement in science and technology this term is still controversial in terms of treatment and management. The DDH is considered as most challenged congenital musculoskeletal anomaly. Unfortunately, in many cases the diagnosis may not be possible until child starts walking and generation of inevitable painful crippling followed with degenerative arthritis changes in adulthood. It has been well defined as a main reason of premature arthritis leading to complete replacement of hip.<sup>3</sup>

Global data suggest a prevalence of DDH around 8.6% of all initial replacement of hip. The frequency of premature arthritis leading to hip replacement due to DDH is 28.8% in those who are less or equal to 60 year of age.<sup>4</sup> The dynamic nature of DDH had led to retitling of this term from congenital dislocation of hip to developmental dysplasia of hip.<sup>5-9</sup> Despite the fact that early diagnosis is the best way for treating DDH without complications still in European countries the statistics of new cases is not decreasing.<sup>10</sup>

Dislocations are categorized into two classes. One is the dislocation that arises in otherwise healthy pre or post-natal and is called typical dislocation of hip. The other is the dislocation which is linked with neuro-muscular ailments which is termed as teratologic occurring prenatally.<sup>11</sup> A child normal hip development crucially depends upon compatible stability of the femoral head present within the acetabulum. If its stability is not persistent it would lead to abnormalities in hip joint resulting in cripple walk.<sup>12</sup> The present article assesses the numerous ways of treating young adults for DDH in context of early management and successful recovery outcomes of the disease.

## MATERIALS AND METHODS

It was a prospective cohort study conducted at Department of Orthopaedic, Sahara Medical College, Narowal from 1<sup>st</sup> July 2019 to 31<sup>st</sup> December 2020. All of the cases were indoor patients. A total of 45 (46 hips) patients between 20-37 years of age were enrolled in the study having DDH. The EQ-5D score was used as a descriptive tool for assessing the 5 dimensions including the mobility grade, pain/discomfort, anxiety/depression self-care and routine activity. Each question comprised of three levels comprising of either there is no problems, some or severe problems.<sup>13</sup>

After complete clinical and physical and radiological examination the diagnosis of DDH was made using well designed questionnaire as well as EQ-5D score calculator. An informed consent was taken from each patient and they were also explained about treatment plan, ratio of success and failure of treatment. Patients were divided into three groups with 15 patients in each group. In Group A; surgical instruments and arthroscope was inserted through a small incisions into the hip. A distinct a surgical kit was applied for hip traction and separation of ball and socket. The arthroscope was used for repairing of the labrum tears which has resulted from hip dysplasia. In Group B; surgical dislocation of ball and socket was completed. After conformation of steady reduction, the hip spica was practiced in the human positioning such as the hip joint was configured in 95° flexion and also 40-45° abduction. A t-shaped incision was used for hip joint dissection. After clearing of acetabulum soft tissues a deep transverses ligament was incised to extend inferior piece of the acetabulum. In Group C; periacetabular osteotomy (PAO) was performed by cutting the bone and releasing the hip socket free.

Data was analyzed in terms of frequency by using chi square tool of SPSS version 24. P value less than 0.05 was considered significant.

**RESULTS**

There were 35 females (77.7%) and 10 (22.2%) males. The mean age was 33±1.2 years and maximum number of patients between 26-31 years of age (Table 1).

There were 27 patient suffering from left side DDH than 18 suffering from right side. One of these in Group 3was suffering from both left and right hip DDH. There were 10, 9 and 8 cases with left side DDH among total 45 admitted young adults respectively with a frequency of 66.6%, 60% and 53.3% respectively (Table 2).

Within the various surgical procedures six month follow up showed highest frequency success of periacetabular osteotomy procedure in 94.1% patient (out of 15 treated). This was followed by hip arthroscopy having 46.6% completely cured (Table 3).

Table 1: Demographic information of the patients (n=45)

| Variable           | No. | %    |
|--------------------|-----|------|
| <b>Gender</b>      |     |      |
| Males              | 10  | 22.3 |
| Females            | 35  | 77.7 |
| <b>Age (years)</b> |     |      |
| 20-25              | 11  | 24.4 |
| 26-31              | 25  | 55.6 |
| 32-37              | 9   | 20.0 |

Table 2: Comparison of left or right-side frequency for DDH

| Variable                 | Left side | Right side |
|--------------------------|-----------|------------|
| Periacetabular osteomy   | 10        | 5          |
| Hip arthroscopy          | 9         | 6          |
| Acetabular chondroplasty | 8         | 7          |

Table 2: Comparison of surgical procedures for DDH

| Surgical procedures      | Success rate |
|--------------------------|--------------|
| Periacetabular Osteotomy | 14 (94.1%)   |
| Hip arthroscopy          | 7 (46.6%)    |
| Acetabular chondroplasty | 6 (40%)      |

P<0.05

**DISCUSSION**

The age range between 20-37 years with a mean age was 33±1.2 years and 77.7% of females with dysplasia of hip. Global data from developed countries suggests 81.9% to 88.7% females to suffering from DDH.<sup>13,14</sup> Within developing countries the frequency is 48% as in Pakistan. A statistical variance between women working hours and men was noticeable as 14.6±3.2 hours and 12.3±0.8 hours per weeks in western countries which could be a main reason of their being the majority of carrying this disease at younger age.<sup>16</sup>

There were 27 patients suffering from left side DDH with single case having both hips DDH. Acetabular roof in comparison to vertical cortex of ilium formulates the alpha angle. The normal value should be >60 degrees. Whereas the beta angle is formed by triangular labral fibrocartilage and iliac vertical cortex with a value <77 degrees.<sup>17</sup> Comparing the three surgical procedures the Periacetabular osteotomy showed best result. This procedure has been documented to improve pain management and increase vast improvement than other procedures.<sup>18</sup> One third of the patients who are treated with this procedure have a lifetime expectancy of 30 year ahead with no premature arthritis changes as could be observed in other surgical techniques.<sup>19,20</sup>

**CONCLUSION**

Periacetabular osteotomy might be a more evident treatment plan for DDH with significant acetabular retroversion

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