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Ayurvedic Management of Developmental Displasia of the Hip: A Case Report

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ABSTRACT

Developmental dysplasia of the hip (DDH) poses a significant threat to childhood mobility and can lead to later complications, including the need for hip replacements. This article provides a comprehensive overview of DDH, covering its incidence, prevalence, risk factors, and associated pathology. It emphasizes the importance of early diagnosis and outlines various treatment modalities, ranging from non-surgical interventions like the Pavlik harness to surgical options such as open reduction and hip reconstruction. The article includes a case report of an 8-year-old female with DDH who sought *Ayurvedic* treatment after previous consultations offered surgery as the primary solution. The therapeutic intervention involved a combination of *Koshta Shuddhi, Basti Karma*, and oral medications. The results indicated a significant reduction in pain and improved mobility, demonstrating the potential efficacy of *Ayurvedic* approaches in managing DDH. The discussion delves into the pathophysiology of DDH, highlighting the role of *Vata Dosha* and emphasizing the multifaceted benefits of *Ayurvedic* treatments in addressing the underlying imbalances. The presented case underscores the importance of personalized care and alternative treatment options for DDH, contributing to the broader discourse on holistic healthcare and integrative medicine. In conclusion, this article provides a thorough exploration of DDH, incorporating clinical features, diagnosis, and a detailed treatment case study. It not only contributes valuable insights into the conventional management of DDH but also introduces the potential benefits of Ayurvedic interventions, opening avenues for further research and collaboration between traditional and modern medical practices.

Key words: *Developmental displasia of the hip, Kosta Shuddhi, Basti Karma, Vata Dosha*

INTRODUCTION

Developmental dysplasia of the hip is an important cause of childhood disability. The normal development of the child's hip relies on the congruent stability of the femoral head within the acetabulum. The hip joint will not develop properly if it stays unstable and anatomically abnormal by walking age.[1] Developmental dysplasia of the hip refers to a range of developmental hip disorders from a hip that is mildly dysplastic, concentrically located, and stable, to one that is severely dysplastic and dislocated.[2] This term replaced the previously accepted "congenital dysplasia of the hip", which did not describe the developmental aspect of the disorder.[3,4,5]

Mild dysplasia might never manifest clinically or become clinically apparent until adult life, whereas severe dysplasia is most likely to present clinically in later infancy or early childhood.[6] This disorder underlies up to 9% of all primary hip replacements and up to 29% of those in people aged 60 years and younger.[7]

Incidence

The incidence of subluxation and dysplasia at birth is 10:1000; when implementing universal ultrasonographic screening, the reported incidence is 25:1000-50:1000.[3,8,9] The incidence is higher in cultures that practice swaddling with the lower extremities fully extended and wrapped together.

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ISSN: 2456-3110 CASE REPORT January 2024

Prevalence

The prevalence of developmental dysplasia of the hip varies with age and method of case ascertainment. In unscreened populations, the median prevalence of persistent and clinically diagnosed hip dysplasia is estimated to be 1·3 per 1000 (range 0·84 to 1·5) on the basis of a rigorous review of studies from 44 unscreened populations of predominantly northwest European ancestry living in Australia, the USA, Canada, Scandinavia, and the UK.[10]

Risk Factors: Risk factors include the female sex (80% of the affected children) probably due to increased ligamentous laxity as a result of the circulating maternal hormone relaxin. The left side is involved in 60% of the children, and the right side in 20% and 20% have bilateral involvement. The left side is more commonly involved, perhaps due to the left occiput anterior positioning of most non-breech new-borns where the hip is adducted against the mother's spine with limited space for abduction.[3,8] The breech position is probably the most important single risk factor, whether delivered vaginally or by caesarean section.[1,11,12] Other risk factors include firstborn children, postural deformities, oligohydramnios, and a positive family history.[3,13]

Pathology[14]

Present evidence suggests that there are two distinct types of dysplastic hips; (i) those dislocated at birth (classic CDH); and (ii) those dislocated after birth. The first is primarily due to a hereditary faulty development of the acetabulum and is difficult to treat. The second is due to underlying joint laxity, with a precipitating factor causing the dislocation.

Following changes are seen in a dislocated joint:

- Femoral head is dislocated upwards and laterally; its epiphysis is small and ossifies late.
- Femoral neck is excessively anteverted.
- Acetabulum is shallow, with a steeply sloping roof.
- Ligamentum teres is hypertrophied.
- Fibro-cartilaginous labrum of the acetabulum (limbus) may be folded into the cavity of the acetabulum (inverted limbus).
- Capsule of the hip joint is stretched.
- Muscles around the hip, especially the adductors, undergo adaptive shortening.

Diagnosis

Diagnosis is easy in an older child; but may be very difficult in younger children, especially during infancy. This is because of subtle clinical findings and difficulties in interpreting X-rays of these children.[14] Early diagnosis and treatment are critical to provide the best possible functional outcome. Different screening programs have been devised to recognize DDH as soon as possible. Despite efforts to recognize and treat all cases of DDH soon after birth, the diagnosis is delayed in some children. Dislocation and subluxation can be diagnosed through clinical examination, but some form of imaging is necessary for the diagnosis of stable acetabular dysplasia.[15]

Clinical Features[14]

Following are the salient clinical features at different ages:

At birth: The examining pediatrician may notice signs suggestive of a dislocated or a dislocatable hip.

Early childhood: Sometimes, the child is brought because the parents have noticed an asymmetry of creases of the groin, limitation of movements of the affected hip, or a click every time the hip is moved.

Older child: Parents notice that the child walks with a 'peculiar gait' though there is no pain.

Treatment

The primary aim of treatment is to achieve a concentric reduction of the hip, thereby increasing the chances of a functionally and anatomically good outcome. Avoidance of surgery through early detection and non-surgical management is an important secondary goal, because surgery is associated with a substantial risk of avascular necrosis. Avascular necrosis (AVN) of the femoral head is the most feared complication in children with DDH.[16]

Ideally, patients should be identified and treated in infancy. Failing this, treatment should be instituted as

ISSN: 2456-3110 CASE REPORT January 2024

soon as possible, preferably before 4 years of age.[17,18,19] The goals of treatment in older children with persistent acetabular dysplasia are to delay or prevent the development of osteoarthritis and to obviate the need for arthroplasty at a relatively young age.[18]

Subluxation of the hip joint noted near birth can be observed for 3 weeks without any treatment, as it is commonly corrected spontaneously. After 3 weeks, if there is still evidence of subluxation on physical and ultrasonographic examinations, initiation of treatment is recommended. When the complete displacement of the hip joint is noted at birth, initiation of treatment without an observation period is recommended.[3,8]

The Pavlik harness

This is the most commonly used device today to treat hip instability in infants.[20] Alternatives include the Craig splint and the Von Rosen splint. All three braces are superior to no treatment. The Craig and the Von Rosen splints might be slightly superior to the Pavlik harness,[21] but the Pavlik harness remains the standard treatment for the majority of children younger than 6 months as it is the most thoroughly examined, and found to be safe and highly effective, with success rates greater than 90%.[22-26]

Closed reduction and fixation with spica cast

Closed reduction of the hip joint performed under general anesthesia is indicated in patients who failed to achieve stable reduction with the Pavlik harness. It may also be considered as primary treatment for patients with poor social situation or an unreliable family. Better results were achieved when reduction was performed before the age of 6 months.[3,27]

Open reduction and hip reconstruction

Typically, open reduction is considered for children older than 18 months. However, open reduction is indicated for all children who failed to achieve a stable concentric reduction of the hip joint by closed techniques.

The modified Smith-Petersen anterolateral approach is very useful because it allows for a concomitant pelvic osteotomy, capsulorrhaphy, and usually a shorter period in a spica. Therefore, it is usually the procedure of choice in children older than 18 months.[16,17,28]

Re-dislocation following open reduction is an important problem with a variable incidence. Procedures are being developed in an effort to reduce the rate of re-dislocation.

Following open reduction, a spica cast is used for 6 weeks with immobilization in 30 degrees of abduction, flexion and internal rotation. After cast removal, physiotherapy is recommended.[17]

Femoral osteotomy can facilitate reduction and decrease the rate of osteonecrosis by relieving tension in the hip joint.[17] Pelvic osteotomy is indicated for persistence of acetabular dysplasia when there is insufficiency in acetabular coverage.

In the child older than 3 years, acetabular osteotomy is performed routinely because of the unpredictable re-modelling potential of the acetabulum beyond this age. Femoral de-rotational osteotomy is also usually needed.

For an acetabular procedure, either a Salter or Pemberton osteotomy may be performed. Pemberton osteotomy is an incomplete osteotomy that hinges through the triradiate cartilage. As this is an incomplete osteotomy, it is inherently stable and no internal fixation is required. A spica cast is used for 8 weeks. This procedure is appropriate for patients older than 1.5 years and until skeletal maturity.[29] A combination of Salter and Pemberton osteotomies, called the Pembersal procedure, was also reported. The main complication of this procedure is iatrogenic damage to the triradiate cartilage. The reported results of this operation are satisfactory; however, whether this procedure provides any advantages remains unclear.[30.31]

In the older child or adolescent, if the triradiate cartilage remains open, the triple innominate osteotomy is the procedure of choice. After triradiate cartilage closure, Ganz periacetabular osteotomy, triple innominate osteotomy or a salvage osteotomy (such as Chiari or shelf procedure) should be considered.

ISSN: 2456-3110 CASE REPORT January 2024

Shelf procedures are performed to increase the extra-articular buttress, thereby increasing the load-bearing area of the hip. They are indicated when congruent reduction is impossible, when there is no severe osteoarthritis and when augmentation is needed after other osteotomies. The slotted-shelf procedure is recommended over the other types because of the greater resultant stability.[29,32]

CASE REPORT

An 8-year-old female reported to OPD with her parents with complaints of pain in the lateral aspect right thigh while walking for long distances and climbing stairs, associated with altered gait since 5 years. On taking history, it was revealed that the patient was delivered through C-section since her mother was a known case of Hypertension during pregnancy. The patient cried immediately after birth and all the milestones were attained at proper age. She was apparently normal till the age of 3 years after which the parents' noticed alterations in her gait. No medical consultations were taken immediately. When the patient was 6 years old, she was taken to an allopathic hospital, where she was given calcium supplements and surgery was suggested. Since the parents were not willing for surgery, they opted for *Ayurvedic* treatment and consulted our hospital for better management.

Clinically, vitals were found to be stable. CT scan of the right hip showed shallow right acetabulum, slightly small femoral head epiphysis, subluxation of the hip with superolateral displacement of the femoral head, features suggestive of Developmental Dysplasia of the Hip. The patient was admitted to IPD for further management.

On Clinical Examination

Assessment of Pain:

Mode of onset - gradual, related to movement

Site - lateral aspect of the right thigh

Joint Involvement

Joint involved - monoarticular, Right hip joint

Joint swelling - absent

Stiffness - absent

Tenderness - absent

Crepitus - absent

Joint movement - both active and passive movements possible without pain

Gait - waddling gait

Length of lower limbs: from antero-superior iliac spine to medial malleolus

(On the day of admission)

Right lower limb - 69 cm

Left lower limb - 71 cm

Therapeutic Intervention

The case was diagnosed as *Dhatukshayajanya Vatavriddhi*. Therefore, *Asthi Dhatu Poshana* and *Brimhana* line of management in the form of *Brimhana Basti* was planned to normalize the *Vriddha Vata* and to bring about *Asthi Dhatu Poshana*.

Koshta Shuddhi

Initially *Kosta Shuddhi* was achieved by inducing *Sadyovamana* on the first day and *Sadyovirechana* on the second day. The medicines used were as follows -

1. *Sadyovamana:* Two glasses of milk followed by 2 glasses of *Yashtimadhu Phanta*
2. *Sadyovirechana:* 15ml of *Gandharvahasthadi Eranda Taila* + 15ml of *Panchamutrasava* with milk, considering *Kapha-Pitta Samsarga.*

Other Therapeutic Procedures

Other therapeutic procedures were started on the 3rd day, after achieving *Koshta Shudhhi*. The procedures followed were as follows -

1. *Sarvanga Abhyanga* with *Ksheerabala Taila*
2. *Upanaha Sweda* to the whole body except head and upper limbs
3. *Basti*:

Anuvasana Basti with *Guggulu Tiktaka Ghrita* and *Niruha Basti* with *Dashamoola Panchatiktaka Ksheera*

ISSN: 2456-3110 CASE REPORT January 2024

for 6 days, followed by *Anuvasana Basti* with *Guggulu Tiktaka Ghrita* with *Siddhamakaradwaja* for 2 days.

Oral Medications

On discharge, the patient was advised the following medications :

1. Tablet *Kaishora Guggulu* 1-0-1
2. Tablet *Lashunadi Guggulu* 1-0-1
3. Tablet *Agnitundi Vati* 1-0-1
4. Tablet *Kamadugha* with *Mukta* 1-0-1
5. Capsule *Gandha Taila* 1-0-1
6. *Pinda Neelagiri Taila* for Local Application

Results

With the administration of Basti, the intensity of pain started reducing. At the end of *Basti Karma* procedure, the patient could walk longer distances without pain. She was advised to come for follow-up on every 15th day. The patient was asked to continue with oral medications for 2 months. After which she was advised to undergo treatment again under IPD admission. The treatment protocol showed significant results in alleviating pain.

Discussion

Developmental Dysplasia of the hip joint is a disease characterized by limitation of movements of the affected hip and altered gait. It is believed to be due to *Dhatukshayajanya Vatavriddhi*. Considering this concept, initially, *Sadyovamana* & *Sadyo Virechana* were administered to induce *Kostashudhhi* in the form of *Langhana* and *Ama Pachana* resulting in *Deeptagni*. This was followed by *Sarvanga Abhyanga*, *Upanaha Sweda* and *Basti Karma* in order to bring about *Brihmana* and *Asthi Poshana* by brining *Vata Dosha* to normalcy.

In the procedure of *Abhyanga* where specific oil is anointed all over the body, especially on the head, in the ears and on the feet, the oil should be selected according to the type of the disease. Since *Vata* is the Dosha that needs to be tackled in this case, *Ksheerabala Taila* which is one of the important *Vatahara* oils was selected. *Abhyanga* provides nourishment due to its *Snigdha* (unctous), Mridu (soft) and *Picchila* (sticky) qualities. *Vayu* resides in *Sparsanendriya* (skin) and *Abhyanga* directly works on *Sparshanendriya* to bring *Vata* back to normalcy. *Abhyanga* is *Kapha-Vatahara*, Pushti (health promoting) and *Ayuvardhaka* (increases life span). *Abhyanga* nourishes the superficial and deep muscles and makes the muscles strong and joints stable.[33] *Abhyanga* helps in reduction of spasticity and facilitates free movement of the joint thereby preventing deformities and contractures.[34]

Upanaha, a type of *Swedana*, is one of the basic *Upakramas* of *Vata Dosha*. According to various *Dravyas* used in Upanaha it can be used in different conditions and *Avastha*. Here, *Godhumadi Upanaha* was used which has *Ama Pachana, Sthambha-Graha Nashana, Ushna* properties and *Snigdha*, *Guru, Sthairyakara, Shoolahara, Aasthi-Sandhi Balyakara*, and *Brimhana* properties. As given in the *Samprapti* of *Vatavyadhi*, *Prakupita Vata Dosha* is the main cause to produce signs and symptoms. The *Prakupita Vata* may be in *Sama* or *Nirama Avastha* producing *Shoola* and *Graha*. *Godhumadi Upanaha* has benefits in both the conditions.

Abhyanga along with *Swedana* and *Basti* removes *Avarana* and *Srotorodha* (obstruction of channels). *Abhyanga* and *Swedana* together divert the *Dosha's* from *Shakha* to *Koshta*, later from *Koshta Dosha's* can be managed by *Basti*.

In *Asthi Dhatukshayaja Avasta* - *Tiktaka Kshira Sarpi Basti* is indicated. Hence, for *Anuvasana* - *Guggulu Tiktaka Grita* and for *Niruha* - *Dashamoola Panchatiktaka Ksheera Basti* were given for 6 days, followed by *Anuvasana Basti* with *Guggulu Tiktaka Grita* added with *Siddhamakaradwaja* was given for 2 days. They bring about *Brihmana* and *Asthi Dhatu Poshana* which is the prime motive of the treatment in the present case.

Vata is considered as superior in *Ayurveda*, it is not only responsible for the causation of a wide variety of diseases but also has *Pitta* and *Kapha* in control. It has the power to assimilate things and at the same time

ISSN: 2456-3110 CASE REPORT January 2024

disintegrate them too. Be it *Dhatu*, *Mala* or *Poshana Karma*, everything is under the control of *Vata Dosha*. *Basti Chikitsa* is considered as the best *Chikitsa* for *Vata Dosha. Acharya Kashyapa* says that it is *Ardhachikitsa* for *Vatavyadhis.* It has the capacity to bring about multi-dimensional therapeutic effect like *Brimhana, Shodhana, Shamana, Rasayana, Vajikarana* and many others. *Acharya Sushruta* says that just as big mountains create barrier to the fast moving wind, *Vata* Dosha is subdued by *Basti*. The action of *Basti* over *Vata* is a multi-actioned one. It tackles *Vata* all over the body. *Niruha Basti* brings about *Shodhana* and *Anuvasana* tackles *Vataprakopa Janita* symptoms by properly oleating the body. Thus, the symbiosis of both *Bastis* render the body a *Tridoshahara* effect.

Internal medicines were selected based on the *Dosas* in the *Vyadhi*. *Pathya* was strictly followed during the course of treatment.

Conclusion

Developmental Dysplasia of the Hip, where there is limb discrepancy and reduced movement of the lower limb is concluded to be due to *Dhatukshayajanya Vatavriddhi*. Hence Initially, *Sadyovamana* and *Sadyovirechana* was planned to achieve *Koshtasudhhi*. It was followed by *Asthi Dhatu Poshana* and *Brimhana* line of management in the form of *Brimhana Basti*. Along with these, other *Vatahara* measures like *Sarvanga Abhyanga* with *Ksheerabala Taila* and *Upanaha Sweda* were adopted. The treatment was planned according to disease protocol and medicines for internal administration and *Panchakarma* procedures were selected according to the *Dosha* involved. This treatment helped in improving the quality of life of the patient. The patient had significant relief in the main symptom that is pain. From this case report it can be assumed that Ayurvedic Treatment has a significant role in reducing the symptoms of Developmental Dysplasia of the Hip.

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ISSN: 2456-3110 **CASE REPORT** January 2024

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