

Missed Developmental Dysplasia of the Hip in a 17-Month-old Due to Virtual Health Visitor Checks During the Pandemic

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Abstract: *Background:* Developmental Dysplasia of the hip (DDH) is a condition where the head of the femur is dislocated from its normal position and is usually diagnosed in the new-born. In this study we present a case of missed DDH in a 17-month-old child with characteristic X ray findings, to increase its awareness as early diagnosis and treatment can limit disability. *Case information:* A 17-month-old female child was brought to Urgent Care Centre by her granddad as he noticed that the child was limping. The child was born during the pandemic and the health visitor checks were all over the phone. There was no history of any trauma. Radiographic appearances were consistent with developmental dysplasia of the right hip. *Discussion:* DDH is usually diagnosed at birth, however, missed cases can occur due to lack of repeated clinical examinations especially in view of the pandemic. Early diagnosis and treatment are very important as timely reduction permits normal modelling of the acetabulum and femoral head. Physical examination is the key in the diagnosis of DDH. *Conclusion:* Careful, repeated face to face clinical examination by healthcare provider in contact with the infant is essential throughout the first year of life to diagnose DDH early.

Keywords: Dysplasia, Congenital, Acetabulum, Dislocation, Hip, Femur

1. Introduction

Developmental dysplasia of the hip (DDH) is a condition where the hip joint does not properly form in babies. It is also called congenital dislocation of the hip. In DDH, the hip joint has a shallow socket, and the head of the femur can dislocate [1]. DDH may affect one or both hips and is more common in first born girls. It may affect 1-2 in 1000 new-born babies and lead to limping, pain, and osteoarthritis of the hip and back. Infants need repeated hip assessments during the first year of life so that late onset complications can be avoided. The best possible results depend on early detection and treatment. Delayed diagnosis may lead to gait problems and osteoarthritis of hip and knee [4]. In spite of all efforts to detect all cases at birth, it can be delayed in some cases and results will be worse with increase in the delay of diagnosis. Different screening programs for DDH were implicated. Physical examination is the key in early detection. X ray and

ultrasound play the major role in confirmation of diagnosis. The management is based on the age of the child. Children under 6 months can be managed with abduction brace or closed reduction and spica casting. If this fails, the next option is open reduction and hip reconstruction. Children are more likely to develop normally if diagnosed and treated early and are less likely to need surgery [3]. The risk of DDH can be reduced by hip-healthy swaddling techniques.

2. Case Report

A 17-month-old female child was brought to Urgent Care Centre by her granddad as he noticed that the child was limping. He didn't see the child in the last 6 months due to reverse quarantine from pandemic. The child was born during the pandemic and the health visitor checks were all over the phone. The child had no past medical conditions and had all vaccinations up to date. There was no history of any trauma.

On examination, the child walked with a limp and there was shortening of the right leg. X ray pelvis showed significantly smaller right femoral epiphysis in comparison to the left, the right hip joint space was widened in comparison to the left and the right-sided Shenton's line was not intact. Radiographic appearances were consistent with developmental dysplasia of the right hip. The child was referred to Orthopaedic team for further management.



Figure 1. X ray.

3. Discussion

DDH is usually diagnosed at birth, however, missed cases can occur due to lack of repeated clinical examinations especially in view of the pandemic. The

contributing factors include various genetic, intrauterine, and immediate postnatal influences [2]. A family history of DDH is present in some cases. The muscles of the uterus and abdominal wall in a primigravida are not fully stretched and inhibit free foetal movements. Oligohydramnios is another cause of DDH which is associated with generalized restriction of foetal mobility [5]. Physical examination is the key in the diagnosis of DDH. The clinical signs are the presence of accessory thigh creases, external rotation, and apparent shortening of the limb on the affected side. A pelvic X ray may reveal dislocation of the hip.

Perkin's and Shenton's lines are also useful clinical tools. But imaging is of limited value in the newborn and clinical examination must take precedence in suspected cases [6]. Ortolani's and Barlow's tests should be gently performed at birth and repeated at regular intervals during the first year.

Ultrasound is a well-established Screening tool in the evaluation of the infant hip. This has been endorsed in several countries as it is non-invasive and is able to diagnose DDH even if the clinical examination is normal which would have been missed otherwise.

Staging of DDH by ultrasound study can be carried out by Graf classification as follows.

Table 1. Graf classification.

	Alfa angle	Beta angle	Description	Treatment
1	>60	<55	Normal	None
2	43-60	55-77	Delayed ossification	variable
3	<43	>77	Subluxated	Pavlik harness
4	Unmeasurable	Unmeasurable	Dislocated	Pavlik harness/open vs closed reduction

Alpha angle is the angle created by lines along the bony acetabulum and the ilium, normal is $> 60^\circ$

Beta angle is the angle created by lines along the labrum and the ilium, normal is $< 55^\circ$

In this particular case, the diagnosis was missed as all the health visitor checks were over the phone due to the pandemic and face to face clinical examination was never done in the first year of life. Early diagnosis and treatment are very important as timely reduction permits normal modelling of the acetabulum and femoral head. If delayed, compensatory soft-tissue contractures hinder reduction of femoral head [7].

Treatment options are bracing, closed reduction and casting, surgery [13]. The brace commonly used is a Pavlik harness as shown in the figure.

Surgical treatment is indicated if the diagnosis is made after the age of 6 months or if the treatment with Pavlik harness has failed. The surgical procedure can be either closed reduction or open reduction which is done under general anaesthetic [12]. Osteotomy may be required in some cases to correct any deformities.

Several hospitals decided to defer face to face evaluations of non-urgent conditions to prevent the spread of covid pandemic [15]. DDH specialists have a different view, and they are of the opinion that DDH screening should not be considered as non-urgent as missed diagnosis can lead to

long term consequences.



Figure 2. Pavlik Harness.

Walking may be delayed in Children treated with casts but development proceeds normally after removing the cast [14]. Skin irritation is a common complication of Pavlik harness. Leg shortening may remain and growth retardation of the femur may occur due to interference with blood supply [16].

Children are able to develop a normal hip joint without functional issues if the condition is detected and treated early [9]. If left untreated, it can lead to pain and osteoarthritis and shortening of the leg. Even with proper treatment, hip deformity and osteoarthritis may develop later especially if treatment is delayed until after 2 years [11].

4. Conclusion

Careful, repeated face to face clinical examination by healthcare provider in contact with the infant is essential throughout the first year of life to diagnose DDH early. Infants at high risk of developing DDH are females, firstborn and breech presenters [8]. Early diagnosis depends on repeated gentle, meticulous handling of the infant. Early treatment is critical and reduces the likelihood of severe disability in later life [10]. Paediatricians must ensure that routine health visits for the well-being of infants are carried out regularly as missed cases can cause disastrous consequences, that would have been easily prevented, as in this case.

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