

# Radiographic Artifact Mimicking Epiphysis of the Femoral Head in a Seven-Month-Old Girl

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Conventional x-ray is still the most important diagnostic and follow-up tool in developmental dysplasia of the hip joint, where hip joint ultrasonography cannot be performed. Artifacts that are seen because of technical errors can cause difficulties in diagnosis and even can lead to wrong diagnoses and treatments. Herein, we report a diagnostic problem caused by an x-ray artifact in a child who is followed up with developmental dysplasia of the hip joint.

**Key words:** developmental dysplasia ■ hip ■ artifact ■ x-ray

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## INTRODUCTION

Conventional x-ray is one of the most important diagnostic tools and is still used to diagnose many diseases, especially musculoskeletal problems. As with all diagnostic tools, it can give us correct guidance only when performed according to the technical rules. Failure of applying the technique correctly can lead to radiographical artifacts that can cause serious diagnostic and treatment errors.<sup>1-4</sup> We report a diagnostic problem caused by the technical error of an x-ray of a seven-month-old baby with developmental dysplasia of the hip joint.

## Case Report

A seven-month-old girl (born from a healthy mother and father) was brought to our clinic with the diagnosis of developmental dysplasia of the hip joint. She was diagnosed with developmental dysplasia of the hip joint at 3 months of age and had been receiving treatment with a Pavlik harness since then. At the end of four

months of treatment with the harness, ideal reduction could not be achieved and she was referred to our clinic for surgical treatment.

Limited abduction, asymmetry of skin folds and 1-cm shortness of right lower extremity were detected in her initial physical examination. When we examined the x-rays taken one month before she was referred to our clinic, we detected that there was a well developed circular epiphysis on the dysplastic right side, but the epiphysis of the uninvolved side could not be seen (Figure 1). Knowing that the patient was treated with a Pavlik harness, we thought that there could be an avascular necrosis on the uninvolved side because of a wrong application of the harness. We ordered new x-rays and saw that there was an epiphysis on the uninvolved side that was much better developed than the dysplastic side (Figure 2). We concentrated again on the first x-ray and realized that the well developed epiphysis on the involved side was in fact an artifact of a button on the patient's clothes (Figure 1) and 5 cm above that pseudoepiphysis, there was an image of another button. When we questioned her mother, we learned that the technician who took the first x-ray had told the family that it was not necessary for them to take off her clothes during the procedure.

## DISCUSSION

The x-ray findings of developmental dysplasia of the hip joint are published in detail in the literature and the classical textbooks.<sup>5</sup> The general x-ray findings in developmental dysplasia of the hip joint are: acetabular dysplasia, decrease in acetabular index, decrease in center-edge (CE) angle, proximal and lateral migration of femoral neck and epiphysis, break in Shenton's line, and delayed ossification of the involved femoral epiphysis.<sup>5,6</sup> Despite developmental dysplasia of the hip joint, the presence of a well-developed epiphyseal image was an unexpected radiological feature in our patient. Pavlik harness application was described by Dr. Pavlik Ramsey in 1976, and this treatment is still used in patients with developmental dysplasia of the hip joint.<sup>7</sup> One major drawback of this treatment method is the development

**Figure 1. The x-ray taken at the other institution. Right femoral head epiphysis is seen in a clear and well-developed shape. But there is no impression of an epiphysis at the left side. Another button, the same as the one which gave an impression of a well-developed epiphysis, is also visible 5 cm above the first one.**



of avascular necrosis, which has been reported up to 20% in some series, especially in hyperabducted hips.<sup>7-10</sup> We had the false impression that our patient had avascular necrosis at the uninvolved site at the time of presentation and had thought that we were facing a complication of Pavlik harness.<sup>1,7</sup>

Diagnostic errors resulting from x-ray artifacts have been reported before.<sup>1-4</sup> In our case, superimposition of the clothes' buttons could lead us to a wrong diagnosis.

The take-home message from this case is that: a diagnostic method such as an x-ray, though simple, easy and very familiar to every physician, can be extremely misleading if not used properly and without sticking up to the technique. The physician should keep in mind the technical errors of imaging modalities when there is an unexpected finding.

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**Figure 2. The x-ray taken at our institution. The epiphysis of the uninvolved side is much better developed than the involved side as expected.**



Use of the Pavlik harness in the child during the first six months of life. *J Bone Joint Surg Am*. 1976;58:1000-1004.

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