Treatment of congenital hip dislocation before the walking age

Daniele Sini, Federica De Rosa, Carlo Origo

Orthopedics Department, SS. Antonio e Biagio e Cesare Arrigo Children's Hospital, Alessandria, Italy

Abstract

The condition known as Congenital Hip Dislocation (CHD) is the worst form of hip developmental dysplasia, characterized by a combination of acetabular cavity, proximal femoral segment, and ligamentus capsule apparatus dysmorphisms that cause partial or complete loss of the hip joint's relationship. We offer a sample scenario: Male, 2 month of age, with diagnosis of hip dislocation. Patient underwent traction by Morel tecnique: progressive longitudinal skin traction, than progressive abduction. Under general anesthesia we performed artrography of the hip, that showed reducible and stable hip; we proceeded with spica cast immobilization in human position. The goal of the treatment is to lessen the dislocation and rebuild joint relationships in order to encourage the proper development, enhance standing posture, improve gait, and correct pelvic and spinal imbalances. The purpose of slow and gradual traction on Morel's bed is to gradually clean the structures to reduce the chances of distant Avascular Necrosis (AVN) of the femoral head development.

Correspondence: Daniele Sini, Orthopedics Department, SS. Antonio e Biagio e Cesare Arrigo Children's Hospital, Spalto Marengo 46, Alessandria, Italy.
E-mail: daniele.sini@ospedale.al.it

Key words: Congenital hip dislocation; morel technique.

Funding: None.

Contributions: All the authors gave substantial contributions to the conception, design of the work, the acquisition, analysis, and interpretation of data for the work; all the authors contributed equally drafting the work and CO, the Department Chief, revised it critically for important intellectual content; the work had the final approval of the version to be published of all the authors; all the authors reached an agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of interest: The authors declare no conflict of interest.

Availability of data and materials: All data underlying the findings are fully available.

Ethics approval and consent to participate: No ethical committee approval was required for this case report by the Department, because this article does not contain any studies with human partici-pants or animals. Informed consent was obtained from the patient included in this study.

Consent for publication: The patient's guardians gave their written consent to use the patient's per-sonal data for the publication of this case report and any accompanying images.

Received for publication: 30 September 2022.
Revision received: 4 October 2022.
Accepted for publication: 4 October 2022.

La Pediatria Medica e Chirurgica 2022; 44(s1):300
doi:10.4081/pmc.2022.300

Introduction

The condition known as Congenital Hip Dislocation (CHD) is the worst form of hip developmental dysplasia; it is characterized by a combination of acetabular cavity, proximal femoral segment, and ligamentus capsule apparatus dysmorphisms that cause partial or complete loss of the hip joint's relationship.

Typical skeletal changes are: small size of the femoral head, femural neck anteversion, small size and eludent acetabular cup; all of this features lead to hip instability.

Progressive traction using the Morel method (Figure 1) has been our primary mode of treatment for the past 35 years (before the walking age); in our opinion and in our experience, this is still the best course of action to prevent avascular necrosis of the femoral head.[1-3]

Case Report

Here, we offer a sample scenario. Male, term birth, caesarean section, breech,. Born 2.5 kg in weight. At birth, there was an Ortolani positive sign, and the first US revealed left hip displacement. After 40 days of Tubingen brace therapy, a second US confirmed the left hip displacement.

At 2 months of age, he was admitted to our department. He present limited hip abduction, still Ortolani positive sign and shortened leg. X-ray confirmed the diagnosis, as showed in Figure 2.

At this point, the patient underwent progressive traction by Morel technique on specific bed, starting with bilateral 300 hg weight of longitudinal skin traction, than progressive upgraded to 900 hg in a period of 15 days. Subsequently he started progressive abduction, same weight traction, for 10 days. He reached 90° of abduction for each hip. During this 25 days period there were no complications.

At the end of abduction, we brought the patient to operation room, and under general anesthesia we performed an artrography of the hip that showed reducible and stable hip (Figure 3),[4-6] so we proceeded with immobilization with spica cast in human position (90° of abduction, 90° of flexion).

After that we checked up the joint by CT scan that confirmed correct hip position.

The patient was discharged and the cast immobilization was maintained for 88 days. At cast removal, X-ray control show reduced and stable hip; then we place a Milgram brace, with monthly clinic control, and X-ray after three months.

Hip was reduced, stable, with no clinic limitations compared to contralateral one, so the patient was discharged free of any brace.

Next clinical controls were at 3 and 6 months after treatment, and X ray check was at 1 year after reduction.

Patient start walking at 12 months, clinic and radiographic exams were performed at two, three, five and seven years of age.

Hip develop correctly and femoral head did not show signs of avascular necrosis.[7]

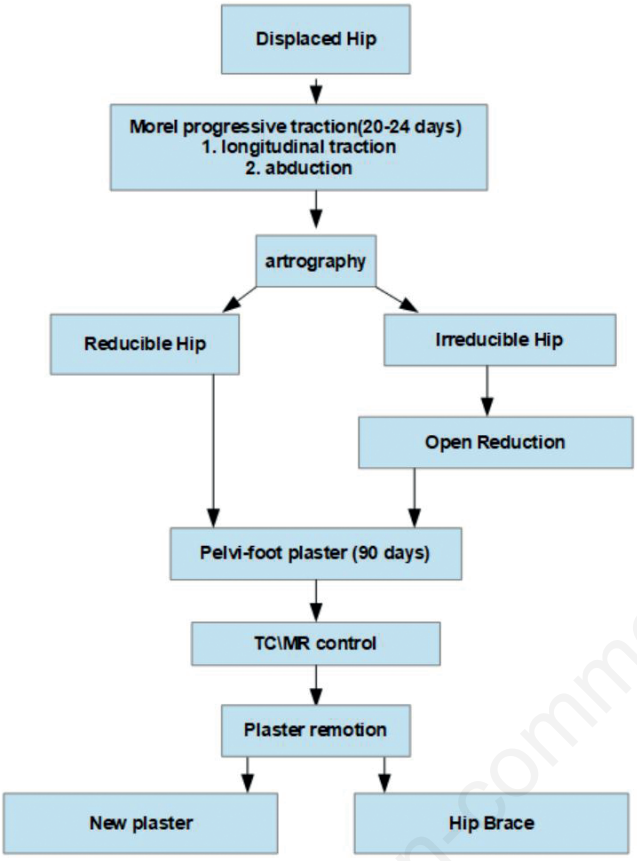

Figure 1. Our institute treatment algorithm.

Conclusions

The goal of the treatment is to lessen joint dislocation and rebuild joint relationships in order to encourage proper joint development, enhance standing posture, improve gait, and correct pelvic and spinal imbalances. The purpose of slow and gradual traction on Morel's bed is to gradually clean the structures to reduce the chances of distant Avascular Necrosis (AVN) of the femoral head development.

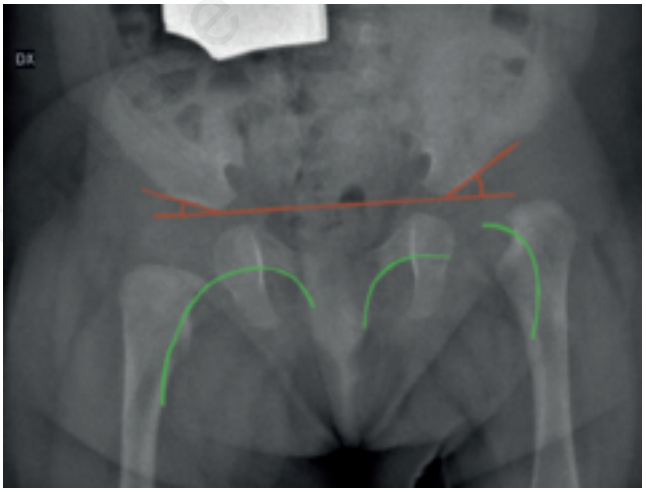

Figure 2. X-ray displaced hip.

Figure 3. Artrography exam.

The main causes of femoral head necrosis are compressive, such as forced reductions, stretching, and even abduction, where the head is compressed by the muscles around it. It is also crucial that the hip is in the proper position when it is immobilized in a spica cast and then with a brace.

In order to center the femur inside the acetabular cavity without suffering from cephalic vascularization and to prevent recurrent dislocation, the femur must be properly flexed and abducted to the "safe zone."

Safe zones are those with the hips flexed at 80–90 degrees and abducted at roughly 60-80°. There is a risk of reluxation for abduction values below 60°, and a risk of vessel stretching for values above 80°.

References

1. Morel G. The treatment of congenital dislocation and subluxation of the hip in the older child. Acta Orthop Scand 1975;46:364-99.
2. Roasenda F. La trazione nella cura della lussazione congenita dell'anca [Traction in the treatment of congenital dislocation of the hip]. Minerva Ortop 1956;7:614-8.
3. Farsetti P, Efremov K, Caterini A, et al. The effectiveness of preliminary traction in the treatment of congenital dislocation of the hip. J Orthop Traumatol 2021;22:26.
4. Agashe MV, Kapoor D, Vaidya SV. Technique and Interpretation of Arthrogram for Developmental Dysplasia of the Hip. Indian J Orthop 2021;55:1601.
5. Foulk DM, Mullis BH. Hip dislocation: evaluation and management. J Am Acad Orthop Surg 2010;18:199-209.
6. Citlak A, Baki ME. Arthrography of the hip should be performed before incision in developmental dysplasia of the hip. J Pediatr Orthop B 2019;28:415.
7. Kalamchi A, MacEwen GD. Avascular necrosis following treatment of congenital dislocation of the hip. J Bone Joint Surg Am 1980;62:876-88.