Address of the first author

Last name	Baumann
First name	Thomas
Academic title	Dr. med.
Clinic/Departement/Inst.	Zentrum für körper- und sinnesbehinderte Kinder
Address	Werkhofstrasse 17
Postal code	4502
City	Solothurn
e-mail	tombaum@gawnet.ch
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4-Year Follow-up of Ultrasound-Based Diagnosis and Non-surgical Treatment of Developmental Dysplasia of the Hip in Mongolia: A Prospective Cohort Study

Baumann Thomas[1,2], Munkhuu Bayalag[3], Chuluunbaatar Battulga[3], Essig Stefan[4,5]

[1] Zentrum für körper- und sinnesbehinderte Kinder, Solothurn , [2] Gruppenpraxis für Kinder und Jugendliche, c/o Bürgerspital, Solothurn , [3] National Center for Maternal and Child Health, Ulaanbaatar, Mongolia , [4] Institute of Primary and Community Care, Luzern , [5] Swiss Paraplegic Research, Nottwil

Purpose: Avascular necrosis of the femoral head and residual dysplasia can occur after non-surgical treatment of developmental dysplasia of the hip (DDH). In former studies, 0 to 14 percent of treated hips developed avascular necrosis of the femoral head; 2 to 29 percent developed a residual hip dysplasia. Both are indications for surgical procedures and cause pain and early osteoarthritis despite interventions. We therefore aimed to determine their prevalence in a prospective cohort study of Mongolian newborns.

Materials and Methods: Hips of all children born within one year in the largest pediatric hospital of Mongolia (n=8356) were examined by ultrasound at a median age of one day and treated with Tubinger splint if DDH was present (n=107). All treated children could be discharged with heathy type 1 hips after monthly checks by ultrasound. A representative sample of 51/107 treated children was followed up at 3-4 years of age with conventional radiography. We determined 1) the formation of the femoral head (condensed) and joint space (narrowed) as signs for avascular necrosis; and 2) the acetabular angle (≥28 degrees in ≤3 year old participants or ≥25 degrees in those >3 years) as sign for residual dysplasia. Furthermore, we asked the parents about swaddling.

Results: No child showed signs for avascular necrosis. One child had a sign for residual dysplasia (25.8 degrees on the left at age 3.5 years). Angles in all other children were below the thresholds and highly variable, ranging from 11.1 to 26.2 degrees. They were slightly higher in girls than boys, and on the left compared to the right. Swaddling

behavior did not affect the results.

Conclusion: Ultrasonographic diagnosis of DDH and treatment with Tubinger splint within the first few weeks of life is safe and efficient in preventing surgical interventions. The prevalence of avascular necrosis of the femoral head and residual dysplasia in Mongolia is among the lowest in literature.