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# Possibilities of minimally invasive treatment of hip subluxation in children with cerebral palsy

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***Abstract***

Introduction: Hip subluxation is one of the main problems in children with cerebral palsy (CP) after the equines foot. Without treatment, we see a deterioration of around 7% per year. In addition to the delayed verticalization, the main cause is the pathological muscle tone of the muscles surrounding the hip. Children with restricted ability to walk and stand independently are most affected, which is assessed using the classification system for gross motor function (GMFCS).It is a common therapeutic measure to treat muscle imbalance by releasing the shortened soft tissue in early childhood. Here we prefer percutaneous myofasciotomy to lengthen short muscles. The Iliopsoas muscle cannot be lengthened percutaneously. Since muscle lengthening is not sufficient for older children with hips at risk, we use additional guided growth as a minimally invasive method to prevent further hip subluxation. In this regard, two other studies already showed a positive effect.

Methods: This was a prospective follow-up study from 2010 to 2016 of 52 children aged 2.8 to 6.7 years (29 boys and 23 girls) who were to be treated surgically with a percutaneous muscle fascia release due to structural muscle shortening. In the preoperative examination, an X-ray image revealed a Reimer migration index (RMI) of over 25%. All children were classified according to their functional possibilities (GMFCS II 3 children, III 14 children, IV 18 children, V 17 children) and the mobility of both legs (ROM) was measured. The second group of 12 children over the age of 6 (6.1 to 12.7 years) (7 boys, 5 girls)underwent femoral head epiphysiodesis in addition to the release of the fascia between 2016 and 2018. The group was also examined according to the same criteria (III 2 children, IV 5 children, V 5 children).We followed these children postoperatively and reevaluated radiological and clinical findings.

Results: For 99 observed hips of 52 children with CP GMFCS 3-5 younger than 6 years of age(average 4.2 years), we found an improvement in hip subluxation for 33%, deterioration for 5% and stabilization for 62%. For our patients older than 6 years, we combined the percutaneous myofasciotomy with a guided growth of the femoral head by percutaneous screw. For 16 hips of 12 children we Found a mean improvement in the migration index of 5%, and an improvement in the femoral neck shaft angle of 9° within 16 months.

Discussion:The minimally invasive release of muscle fascia appears to be as effective as the open release, as it is done with hip screening programs in many countries. The recovery of children who receive minimally invasive treatment is faster, however. Less surgical soft tissue damage, faster mobilization and fewer restrictions than varus osteotomy are strong arguments to consider guided growth as a treatment option for Coxa valga in spastic hip subluxation in non-ambulant children with CP.

Conclusion: Further studies have to prove the effectiveness of this method in the long term.

***Biography:***

Dr Peter Bernius studied medicine at the University of Heidelberg. In his orthopaedic and pediatric orthopaedic training, he went through various stages at the Surgical Clinic in Darmstadt, at the University Hospital Oskar-Helene-Heim in Berlin and the University Hospital in Freiburg. Since 2001 Dr Bernius works as chief physician of the Center for Pediatric and Neuro-Orthopedics of the Schön Klinik Munich Harlaching. He is an internationally recognized specialist in minimally invasive surgical procedures, early functional rehabilitation, functional orthotics, and specialized learning programs to support neuroplastic regeneration.

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