

Herbert Capsuloplasty and Burnei Tenomyoplasty for the Correction of Genu Flexum in Cerebral Palsy, Arthrogyposis and Posttraumatic

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Abstract

Introduction: Studies of gait dynamics revealed the complex motions that the knee must undergo in sync with the hip and ankle, in both the swing and support phase of walking. If these motions are restricted, usually as a consequence of cerebral palsy or arthrogyposis, normal gait is hindered; the patient may be able to walk for very short distances or, eventually, not at all. Children with knee extension limited by 10 - 30 degrees, especially those with cerebral palsy, exhibit a stance compatible with walking. Walking is difficult and the gait pattern, "crouch gait", is considered typical for this degree of limitation.

Aim: This paper is meant as an update regarding the usefulness of Herbert knee capsuloplasty, conceived in 1938 and introduced in Romania in 1956 by Clement Baciu, and Burnei distal medial hamstring tenomyoplasty, invented in 1993.

Materials and methods: Herbert knee capsuloplasty, although initially intended for ailments other than spasticity or arthrogyposis, became known, in time, as a useful operation for spastic genu flexum with a 15 to 30 degree limitation of extension. Severing the posterior cruciate ligament (PCL) in children less than 10 years old often results in genu recurvatum or joint instability. In order to avoid these complications, PCL transection has been phased out and our clinic started to use, preferentially for spastic genu flexum rather than arthrogyposis, the Burnei tenomyoplasty. When applied in the same operative session, the two techniques complement each other and act in synergy.

Results: Herbert capsuloplasty can achieve only partial correction of genu flexum ranging between 30 and 60 degrees of extension deficit. Full extension is opposed by the PCL, contracture of the hamstrings and vascular retraction. Burnei tenomyoplasty used by itself is useful for genu flexum with less than 30 degrees of extension deficit. For children with 30 to 60 degrees of knee extension deficit, combining the Herbert and Burnei procedures achieves the best results.

Conclusions: The simultaneous application of Herbert capsuloplasty and Burnei tenomyoplasty allows for the correction of stiff genu flexum and enables the patient to resume walking, with or without support. This course of treatment also avoids the progression of genu flexum beyond 60 degrees, which would require an osteotomy. This combined procedure avoids the cartilage lesions which may develop when patients with 30 - 60 degree genu flexum undergo Herbert capsuloplasty alone. Not in the least, the risk of postoperative knee dislocation is significantly reduced.

Key words: cerebral palsy, arthrogyposis, genu flexum, knee flexion, distal hamstrings, tenomyoplasty, capsuloplasty, knee ROM

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