

Introduction:

Pediatric rotational lower limb deformities are common and usually self-limited. Anteversion angle of the femur is the angle between the axis of the femoral neck and the axis of the distal condyles at the most posterior points. There is a gradual decrease in femoral anteversion in the first decade of life with improvement of the gait pattern[1,2]. Excessive residual femoral anteversion can be complicated by external rotation of the tibia in older children. This mismatch can lead to hip and knee problems, difficulties with running and psychological problems because of the abnormal gait[3-7].

The most common cause of intoeing is cerebral palsy. Idiopathic persistent femoral anteversion is another cause of intoeing[8,9]. To our knowledge, there are few literatures searching surgical treatment of idiopathic type.

Femoral osteotomies were described in the literatures either proximal or distal with the benefits and complications of either level[9-12]. Also, many fixation methods have been used including plates[13-15] and interlocking intramedullary nails[16-20]. Another method of fixation is external fixator[15,21-23]. The aim of this study was to focus on the results of proximal diaphyseal derotational osteotomy in idiopathic intoeing using the Ilizarov external fixator.

Patients and methods

The clinical and radiological data of children who underwent proximal diaphyseal femoral derotation osteotomy between January 2014 and June 2017 were reviewed in this prospective study. Data were collected

including age, gender, operative time and time to complete consolidation and frame removal. Presenting complaints were documented including hip or knee pain and frequent falling. Also, the pre and postoperative internal rotation degree were collected and analysed. Rotational profile of lower limbs was carefully assessed according to the Staheli[24] to determine the level of intoeing gait. Medial rotation more than 70° suggests a diagnosis of excessive femoral anteversion. The degree of femoral anteversion angle was confirmed by computed tomography (CT) scan.

Inclusion criteria were 1) children above the age of 7 years 2) persistent idiopathic intoeing with a femoral anteversion angle above 70 degrees clinically and 30 degrees on CT scan.

Exclusion criteria were 1) children younger than 7years. 2) internal rotation less than 70 degrees. 3) history of major lower limb skeletal trauma or orthopaedic procedures. 4) Patients with asymptomatic femoral anteversion were excluded from this study.

All procedures followed were in accordance with the ethical standards of the responsible local institutional committee on human experimentation and have been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. Informed consents were taken from child's caregivers. Derotation osteotomy was performed in 21 patients (37 limbs). The deformity was bilateral in 16 children, left in 3 cases while 2 cases were right side affected. There were 9 boys and 12 girls of mean age of 9.3 years (7-11). The mean weight was 36.4 kg (range 25-45). Both limbs were operated at the same time in all bilateral cases.