

Insertion of One-third Tubular Plate for Hemiepiphyodesis in Children: Surgical Technique

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Abstract

Limb length discrepancy and angular deformities are among the main issues in paediatric patients. There are various ways to manage these two problems which includes growth modulation with eight-Plate. For certain reasons, the use of the eight-Plate is limited, thus conventional plates have been selected for the guided growth, for example two-hole one-third tubular plate or reconstruction plate. Literatures reported good results on its use but none of them explained the surgical technique in details. Therefore, we proposed the surgical technique of inserting the two-hole one-third tubular plate in hemiepiphyodesis in children, which includes pre-skin incision preparation, placement of one-third tubular plate and screw insertion. The three steps are surgeon-friendly and less demanding, being suitable to apply to paediatric patients that require growth modulation.

Keywords: Angular deformity, Hemiepiphyodesis, One-third tubular plate, Limb length discrepancy.

Introduction

Limb length discrepancy and angular deformity are common in children. In cases when the physis is still open with the remaining growth of more than two years, the treatment of these two conditions with growth modulation is famous among paediatric surgeons [1-20]. Less invasive, immediate weight-bearing, avoiding or delaying more invasive surgeries, early rehabilitation and minor and fewer reported morbidities are the advantages of the guided growth compared to bone lengthening or corrective osteotomy for limb length discrepancy and angular deformity, respectively [1-10, 12-15, 18].

Historically, the epiphyodesis has been introduced to the medical field as early as 1933 by Phemister albiet with its own disadvantages [1, 6, 14, 19]. Since then, many others have refined it such as the first reversible technique using staples by Blount and Clarke, eight-Plate

by Stevens and drilling using a low-speed high torque drill by Bowen [1, 6, 8-11, 13, 14, 18]. The reversible technique is widely accepted as it does not destroy the physis of the bones but rather just halts its progression [1]. The use of guided growth has evolved from the treatment of angular deformity to treatment of limb length discrepancy, coronal deformity and joint dislocation [1, 4-5, 6, 8-10, 12, 15, 19].

The use of eight-Plate was popular among surgeons for growth modulation in children [1, 7, 18]. The implant design makes its surgery less demanding. In view of cost and availability issues, some authors alternatively used two-hole reconstruction plate or one-third tubular plate for the hemi epiphyodesis [16]. As the latter plates have a different design from the original eight-Plate, therefore the surgical technique in putting the plate would also be different. To date, there have been no reports on this technique in detail. Therefore, we would like to propose the surgical technique in