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Commentary

A Short Note on Epiphysiodesis

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DESCRIPTION

Epiphysiodesis is a bone marrow transplant surgery that aims to change or stop bone growth that occurs naturally on a growth plate also known as the physeal plate. There are two types of epiphysiodesis: Transient hemiepiphysiodesis and permanent epiphysiodesis. Temporary hemiepiphysiodesis is also known as the provision of targeted growth or growth flexion surgery. Temporary hemiepiphysiodesis is reversible i.e. the metal implants used to achieve epiphysiodesis can be removed after the desired correction is obtained and the growth plate can resume its normal growth and function [1]. Where, the permanent epiphysiodesis is irreversible and the function of growth plate cannot be restored after surgery, both transient hemiepiphysiodesis and permanent epiphysiodesis are used for the treatment of a variety of pediatric rheumatoid arthritis but the specific indications for each procedure are different.

Temporary hemiepiphysiodesis is widely used in the treatment of angular or coronal plane around the knee in children i.e. paralysis that occurs in the internal/posterior plane such as the genu varum/genu valgum. In addition, it has been used to treat sagittal plane cramps deformities from the inner/back plane. Temporary hemiepiphysiodesis works by binding or inhibiting physeal growth on one side of the growth plate. As a result the other hemi-side is allowed to grow normally and can be prevented. This process takes place slowly and steadily and ultimately leads to the correction of angular deformities in most cases [2]. Temporary hemiepiphysiodesis or targeted growth provision has been used to treat angular deformities in children with various orthopedic and joint diseases such as rickets, blount syndrome, osteochondrodysplasias, arthrogryposis multiplex congenita, idiopathic, renal and others. Temporary hemiepiphysiodesis is increasingly being considered a simpler and more effective, alternate to the time-honored osteotomy or bone-cutting practice.

Bone osteotomy achieves immediate disability correction while temporary hemiepiphysiodesis does gradually. Various types of metal implants have been used to perform temporary hemiepiphysiodesis or provide targeted growth such as a two-hole plate with screws and a basic feed. Any metal implants initially used to achieve temporary hemiepiphysiodesis should be removed when the intended deformity correction is reached [3], otherwise the child will develop a recurrent disability and something known as over-correction. For example, failure to remove a timely metal implant for a child undergoing genu varum treatment can lead to overdose to genu valgum degeneration and vice versa. In general, the effects of temporary hemiepiphysiodesis or targeted growth surgery are satisfactory [4]. Contrary to osteotomy or external correction, it is considered the most painful and safe surgical procedure and low profile problems occur in terms of difficulty and frequency in general.

However, there are concerns about the use of transient hemiepiphysiodesis in certain diseases such as blount's disease and osteochondrodysplasias. Mechanical failure of metal inserts such as plates and screws and failure to complete a repair of defects have been strongly associated with blount's disease. In addition, recurrence of bone deformity or recurrence and subsequent repetitive surgery have been strongly associated with bone deformity arising from osteochondrodysplasias [5]. Generally, children should be followed for recurrence of disability or relapse after removal of the implant used in the implementation of the disability correction. The procedure should be performed at the appropriate time during the patient's growth phase so that the organs are close-to-the-length at the end of bone growth. Adverse events can lead to lengthy misalignment, leading to serious side effects and significant patient illness.

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