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Case Report

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Physeal bar resection in growth arrest in post-traumatic genu valgum

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ABSTRACT

Trauma in young patients often lead to physis injury and ground arrest which can eventually result into deformity. It may result in both limb length discrepency and angular deformity. The extent of growth arrest depends on type of injury and treatment received. Here in this case report, post traumatic injury resulted in growth arrest due to physeal bar formation and subsequent genu valgum, In this case we opted for physeal bar resection with partial physis fusion i. e.; hemiepiphysiodesis. The resultant correction was good and acceptable and hault in growth process was procured. Premature growth arrest is characterized by an unexpected discontinuation of longitudinal and/or appositional bone growth secondary to an insult to the growth plate prior to skeletal maturity. Growth arrest is frequently posttraumatic; however, other aetiologies include congenital conditions (e.g. Blount's disease), infection, neoplasm, irradiation, metabolic/hematologic abnormalities, ischemia, disuse, and iatrogenic injury. Which ultimately results in limb length discrepency (LLD) and if present peripherally, angular deformity as well. In our case we found physical injury from central to peripheral resulting in both LLD and angular deformity. Hence we did growth modulation by resecting central to peripheral physeal bar, to maintain physeal gap fat was been used as inter-positional graft which found to be adequate and stable. Near functional correction was achieved post resection and hemiepiphysiodesis after 1 year follow up.

Keywords: Phseal arrest, Phseal bar resection, Hemiepiphysisodesis, Post traumatic genu valgum

INTRODUCTION

Physeal injuries complicate 18-30% of pediatric fractures. Growth arrest occurs in 5-10% of cases in those with physeal fractures. The incidence of growth arrest is quite variable depending on physeal location, type of injury, and treatment received.[1,2]

Premature growth arrest is characterized by an unexpected discontinuation of longitudinal and/or appositional bone growth secondary to an insult to the growth plate prior to skeletal maturity. Growth arrest is frequently posttraumatic; however, other aetiologies include congenital conditions (e.g. Blount's disease), infection, neoplasm, irradiation, metabolic/hematologic abnormalities, ischemia, disuse, and iatrogenic injury.[3] The most frequently injured physis is the distal radius.[1]

The outcome of premature growth arrest is based on skeletal age, location and extent of the associated physeal bar. A central physeal bar results in cessation of longitudinal growth, and subsequently a limb length discrepancy (LLD). A peripheral physeal bar may result in both a limb length discrepancy as well as angular deformity.

CASE REPORT

A 9 year old male with post traumatic post-surgical genu valgum with physeal bar since a year. Since patient presented with post traumatic and with post-surgical deformity (surgery done elsewhere). Few complications which were appreciated are: physeal bar formation and growth arrest, need for physeal bar resection and growth modulation.

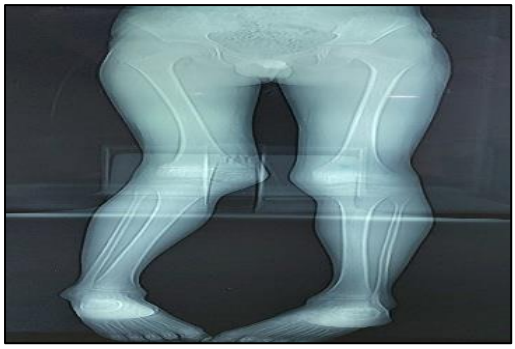

Figure 1: Pre-procedure radiographs.

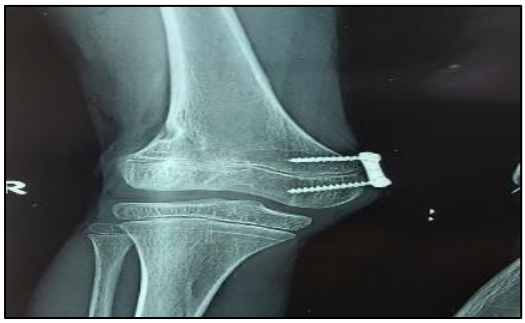

Figure 2: Pre-procedure radiographs.

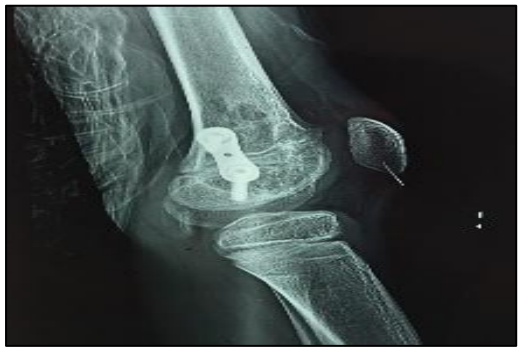

Figure 3: Pre-procedure radiographs.

Surgery

Physeal bar resection+medial transient hemiepiphysiodesis (growth modulation) right distal femur (26 mm 8 plate)+fat graft.

Figure 4: 1 year follow -up post procedure.

Figure 5: 1 year follow-up post procedure.

DISCUSSION

There is study by Marquijo et al in which thers is retrospective analysis of patients treated with distal femoral physeal bar resection, fat graft interposition, and growth modulation with a tension-band plate. Data recorded included patient demographics, growth arrest cause, physeal bar size, time-to-surgery, details of the operative procedure, and complications.[5] The mechanical axis zones, tibiofemoral angle, and the anatomic lateral distal femoral angle were assessed on 51-inch anteroposterior standing radiographs. Out of 5 patients 4 got complete correction from which 2 developed rebond valgus deformity which was corrected. Comparatively in Our study we got good valgus and deformity coreection, with no recurrence or rebond in a year follow up. To assess more about growth modulation we may need more prolonged follow up. The results was satisfactory and physeal ressection and physeal fusion is sort after method for these kind of challenging deformity corrections.

CONCLUSION

There is a fair bit of correction about 4-5mm of growth post one year after physeal bar resection and Hemiepiphysiodesis with Tibio-femoral angle (TFA) about 10º and apparent LLD about 1 cm and fat graft served a good purpose as interpositional material. The TFA from 20º was corrected to near 10º. The was acceptable growth modulation post hemiepiphysiodesis, and growth arrest and angular deformity problem was addressed adequately. There were similar study, by Masquijo et al which shows the adequacy of distal femur physeal bar resection and hemiepiphysiodesis for the correction of angular deformity and limb length discrepancy. The results are comparable and satisfactory.

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Ethical approval: Not required

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