INTRODUCTION

Surgical treatment of adolescent tibia vara (Blount disease) is the predominant approach for realignment (Herring, Tachdjian's pediatric orthopedics). Osteotomy is the most common approach but because of potential complications associated with it, gradual correction by hemiepiphysiodesis should be considered an alternative. Hemiepiphysiodesis is recommended in those patients who have <15° of varus deformity, 2 years of skeletal growth remaining and have less than 1cm of limb shortening (Sabharwal, 2009). Studies have shown that limb realignment is not as predictable in Blount disease patients with hemiepiphysiodesis (Snyder et al 2003, Castañeda et al 2008, Stevens 2007). Risk factors related to failure in achieving more normal alignment include obesity, preoperative mechanical axis > 60mm, and a medial proximal tibial angle <76° (Pauley 2002). The application of a custom molded Offloading Knee Ankle Foot Orthosis (OKAFO) to offset associated varus thrust of the knee along with the predictability of failure in a patient who would be deemed at risk based on current practices is the focus of this case study.

METHOD

In one case study A - Patient A is a female diagnosed with adolescent tibia vara at age 10 + 6. She had a positive history of vitamin D deficiency and was premenarchal. Her mechanical axis deviation measured 67mm and the tibial angle measured 70°, both being risk factors associated with failure. It was the choice of the managing orthopedic team to proceed with a lateral proximal tibial hemiepiphysiodesis and a medial distal tibial hemiepiphysiodesis with custom OKAFO to offset varus thrust. The OKAFO of choice was of a new design, the V-Vas™ (Varum Valgum Adjustable OKAFO to offset varus thrust of the knee along the mechanical axis deviation) and achieve more normal alignment include obesity, preoperative mechanical axis > 60mm, and a medial proximal tibial angle <76° (Pauley 2002). The application of a custom molded Offloading Knee Ankle Foot Orthosis (OKAFO) to offset associated varus thrust of the knee along with the predictability of failure in a patient who would be deemed at risk based on current practices is the focus of this case study.

RESULTS

Orthotic treatment was initiated at the age of 11 years. At the age of 11+1, a follow up radiograph was obtained. Eight months later at the age of 11+9 an additional follow radiograph was obtained showing significant improvement of the medial downward slope of the tibial plateau. Improvement in varus alignment was noted as well. After sixteen months into her treatment, a follow up radiograph was obtained during the visit. The radiograph showed continued decreased medial slope of the tibial plateau. Additionally, the varus alignment was measured at 11°, a 12° improvement over the initial preoperative measurement of 23°. At this follow up visit, it was necessary to re-measure for a new VKAFO due to growth and normal wear and tear.

DISCUSSION

In principle the use of the VOKAFO has its application in patients showing lateral thrust during gait analysis and should be considered in conjunction with less invasive and possibly more invasive surgical procedures. Preoperative management may be a consideration to focus on decreasing pain, promoting weight loss and possibly offsetting further joint instability associated with lateral thrust.

CONCLUSION

Further study with a larger number of patients and long term study will be necessary to add further validity to the findings of this individual case study. The VOKAFO is a new and effective way of augmenting postoperative management of lower extremity bowing deformities and should be a primary consideration when treating such deformities in order to achieve good correction and improve patient comfort and compliance.

REFERENCES

Herring JA: Tachdjian's pediatric orthopedics;3.