Functional and Positional Improvement Following Successful Prosthetic Implementation in a 2-year old with High Transhumeral Congenital amputation: A Case Report.

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Case Description

- A 2-year-old male with right congenital femur deficiency and right congenital transhumeral amputation presented to PM&R clinic to discuss obtaining an upper extremity prosthesis.
- Patient had been carrying objects between his limb and neck, holding his residual limb in an elevated and protracted position, leading to concern for future development of pain and scoliosis, which can occur in unilateral congenital limb deficiency.

Assessment

- On exam, he exhibited less than 1 inch of residual humerus but showed active flexion and abduction along with scapular protraction, retraction, elevation, and depression.
- A right shoulder disarticulation prosthesis with chest strap, friction elbow, and voluntary opening terminal device was obtained.
- Goals were to allow him to become accustomed to wearing a device, and to provide weight to the right shoulder to help balance his neck and scapula.

Discussion

- Incidence of congenital upper limb deficiency is 4/10000[1].
- Most children are fitted with their first passive prosthesis once they are able to sit up. This promotes bimanual tasks. Progression to an active terminal device control typically occurs at greater than one year.
- Late prosthetic introduction increases rejection potential.
- Shoulder disarticulation prosthesis are difficult to control due to number of joints lost. Research has demonstrated that congenital shoulder disarticulation patients face a rejection rate of up to 65%[2].
- Regardless of multiple factors increasing rejection potential, upon receiving his prosthesis, the patient was able to actively cross midline and was able to transition objects into his spring loaded prosthetic hand.
- Scapular postural stabilization was attained.

Conclusions

- The patient demonstrated increased functional movement as he was able to adduct the prosthesis across midline and manipulate it with his left hand to grasp objects.
- Furthermore, with the prosthesis he was no longer carrying objects between his residual limb and neck, reducing risk of neck pain.
- The added weight of the prosthesis is also beneficial to the prevention of scoliosis.

[1]Parker SE, Mai CT, Canfield MA, et al. (2010) Updated National Birth Prevalence Estimates For Selected Birth Defects In The United States. *Birth Defects Research Part A Clinical and Molecular Teratology Abbreviation*, 1008-1016.

[2]Farnsworth, T., Uellendahl, J., (2008). Shoulder Region Socket Considerations. *Journal of Prosthetics and Orthotics*, Vol. 20, 93-106.