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EFFICIENCY OF ANTEROGRADE CALCANEOSTOP SURGICAL TECHNIQUE FOR TREATING PEDIATRIC FLEXIBLE PES PLANUS: A RETROSPECTIVE STUDY

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Relevance. Flexible pes planus is a prevalent deformity of foot among children. The calcaneostop surgical technique has shown to be successful in limited studies, while non-surgical management failed. The study aims to examine the efficiency after implant removal followed by the anteropgrade calcaneostop surgical technique in the management of flexible pes planus in children.

Aim: this study evaluates the efficiency of anteropgrade calcaneostop method based on the clinical results and biomechanical impact, for surgical management of flexible pes planus in children.

Materials and methods. This retrospective study consisted of 65 pediatric patients (49 boys, 16 girls; mean age at 10.2 years) who underwent 130 anteropgrade calcaneostop procedures with screw removal after three years. Inclusion criteria were symptomatic flexible pes planus, age 6–14 years, negative Wynne-Davies test, and informed consent of the patient. Exclusion criteria included age outside this range, other skeletal deformities, and lack of consent. Clinical, radiographic (Meary's angle, arch angles, talocalcaneal angles, calcaneal inclination, tarsal sinus opening, talonavicular coverage), photoplantographic (footprint dimensions and indices), and pedobarographic (plantar pressure in five zones, load graph features) assessments were performed at 6 months, 1 year, and 3 years post-removal. Statistical analysis used StatTech v.4.7.2 and MS Excel. Normality was tested with Shapiro-Wilk, Kolmogorov-Smirnov, and Lilliefors tests; parametric data were analyzed with Student's t-test, non-parametric with Wilcoxon signed-rank test. Ethical approval and informed consent were obtained.

Results and their discussion. Median heel valgus angle showed no significant difference before (4.7° [1.2–7.5]) and after screw removal (4.8° [1.4–7.2]; $p=0.48$). Radiographic, photoplantographic, and pedobarographic parameters, such as angles, dimensions of footprint, indices, and plantar pressure distribution between the five zones, illustrated no statistically significance at 3 years post-removal (all $p>0.05$). Thus, these results signify the sustained correction after screw removal is likely due to elevated muscle tone, improved proprioception, and maturation of connective tissue. This study was primarily male dominant (75%), suggesting male gender as a predisposing risk factor for pediatric flexible pes planus.

Conclusions. The calcaneostop surgical technique is a non-invasive and simple procedure for symptomatic flexible pes planus in children. The accumulated data revealed adequately high efficacy of anteropgrade calcaneostop surgical technique in the management of flexible pes planus in children.