Static Foot Pressure Distribution in Apert Syndrome Patients

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Background

- Apert syndrome is a rare and severe congenital malformation disorder.
- Caused by a mutation of fibroblast growth factor receptor 2 (FGFR2).
- Incidence: 1 in 65,000 live births.
Clinical Presentations:

- Craniosynostosis
- Mid-face hypoplasia
- Underdeveloped upper jaw
- Class III malocclusion
- Syndactyly (fusion) of fingers and toes
Clinical Presentations - Craniofacial Deformities
Clinical Presentations – Hand Deformities

Digits 2-4 fused, thumb & little finger separate

Digits 2-5 fused ("mitten"), thumb separate

All 5 digits fused ("rosebud")
Clinical Presentations – Foot Deformities

Fusion of soft tissue of toes

Digits 2-5 fused, great toe separate

Digits 1-5 fused
Statement of the Problem

At present, no information exists regarding foot function and plantar pressure in Apert syndrome patients after two-stage syndactyly release for the correction of foot.
Purpose of the Study

• To describes plantar pressure patterns in Apert syndrome patients.
Methodology

• This is a descriptive study which describes plantar pressure patterns in Apert syndrome patients.

• The plantar pressure patterns of the feet of thirty-five patients, aged 4-38 yrs (19 female, 16 male) were measured during barefoot standing, using a HR Mat™ System, a high-resolution pressure distribution measurement platform (TekScan, USA).
Fig. 1. HR Mat™ System (TekScan, USA)
Results

• The average percentage of total body weight on the left foot vs. right foot was 47.74 and 52.45 respectively with average difference of 13.89% between feet.

• 31.43 % (11/35) of patients had a large asymmetry (≥20%) in foot contact between the left and right feet.
Results (Cont.)

- Pressure distribution differences between the ball and the heel on both left and right feet was noted, 65.71% (23/35) and 68.57% (24/35) respectively.

- Most patients had higher pressure (weight-bearing) at the heels (82.86% left heels vs. 77.14% right heels).
Results (Cont.)

- Twenty-four of the 35 patients (69%) exhibit a complete lack of lateral arch support in the standing position.
Fig. 2. Foot pressure scans of a 10-year-old male.
Fig. 3. Foot pressure scans of a 11-year-old female.
Fig. 4. Foot pressure scans of a 20-year-old male.
Fig. 5. Foot pressure scans of a 20-year-old female.
Conclusions

• This groundbreaking study shows that most patients present with asymmetrical pressure distribution between their feet, and a lack of support along the lateral arch and gait.

• The findings may be significant factors associated with falls.
Implications for Nursing Practice

• The findings indicate the importance for nurses working with this population to be aware that patients with Apert syndrome may be at high risk for falls.
Implications for Nursing Practice (Cont.)

- Efforts should be carried out to prevent falls, improve quality of care and promote a safe environment for patients with Apert syndrome.
Thank you for your attention!!

ANY QUESTIONS?

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