통증 및 근골격재활

발표일시 및 장소 : 10 월 18 일(금) 15:35-15:45 Room A(5F)

OP1-2-9

How does the difference between ankle invertor and evertor affect the biomechanics of flat foot

Young Ju Shin[1*], So Young Ahn[1], Bong Ok Kim[2], Su Kyoung Bok[1†]

School of Medicine, Chungnam National University, Department of Rehabilitation Medicine[1], 2Korea Worker`s Compensation & Welfare Service Daegu Hospital, Department of Rehabilitation Medicine[2]

Objective

The aim of this pilot study was to investigate the association among the foot posture, and foot pressure and cross-sectional area (CSA) of the ankle invertor and evertor.

Methods

3 children with flatfoot (foot posture index (FPI) > 6) and 3 aged-matched controls were recruited. And we collected a total of twelve foot features. Measurements included resting calcaneal stance position (RCSP), arch height index (AHI) with radiography assessment, CSA of the peroneus longus and brevis (PER), tibialis anterior (TA), tibialis posterior (TP) muscles were obtained using ultrasographic system and plantar pressure distribution were measured through the Free step® system. And questionnaire including the Foot Function Index (FFI) were performed to determine the severity of the symptoms and the location of the pain.

Results

The CSA ratio between evertor and invertor was significantly higher in the flat group than in the control group. and The CSA ratio between TP and PER was higher, too. No correlation was observed between CSA ratio and any pressure distributions in the foot specific region. The correlation between TPI and CSA ratio is not clear.

Conclusion

In this study, we confirmed that the CSA difference between ankle inverter and inverter may affect the foot biomechanics of flat foot patients. We are currently conducting studies to identify significant correlations with more patients and we will also investigate how the outcome changes after applying the rigid foot orthosis for several months.

Table 1. Baseline characteristics of the groups.

Gender (n)	4 men / 2 women
Age (years)	12.7 ± 2.3
Height (cm)	141.6 ± 10.1
Weight (kg)	35.8 ± 5.5
Foot type (n, normal-arched/flat-arched)	3 / 3
Foot length (cm)	213.5 ± 8.7

Table 2. Outcome (CSA) comparisons between flat foot and control groups. CSA : Cross-sectional-area (cm2), TA : tibialis anterior, TP : tibialis posterior, PER : peroneous longus + brevis, E/I : CSA of evertor / CSA of invertor (TA+TP/PER)

	CSA mean (cm^2)			CSA ratio			
	TA	TP	PER	E/I	TA/PER	TP/PER	TP/TA
Flat foot (n=6)	4.6017	1.9033	2.7133	2.4301	2.2257	0.688	0.4048
Control (n=6)	5.2867	1.6167	3.6817	1.8738	2.4307	0.4425	0.3121
Z				-2.4019	-0.3203	-2.8823	-1.6013
p value†				0.015*	0.818	0.002**	0.132

Mann-Whitney test

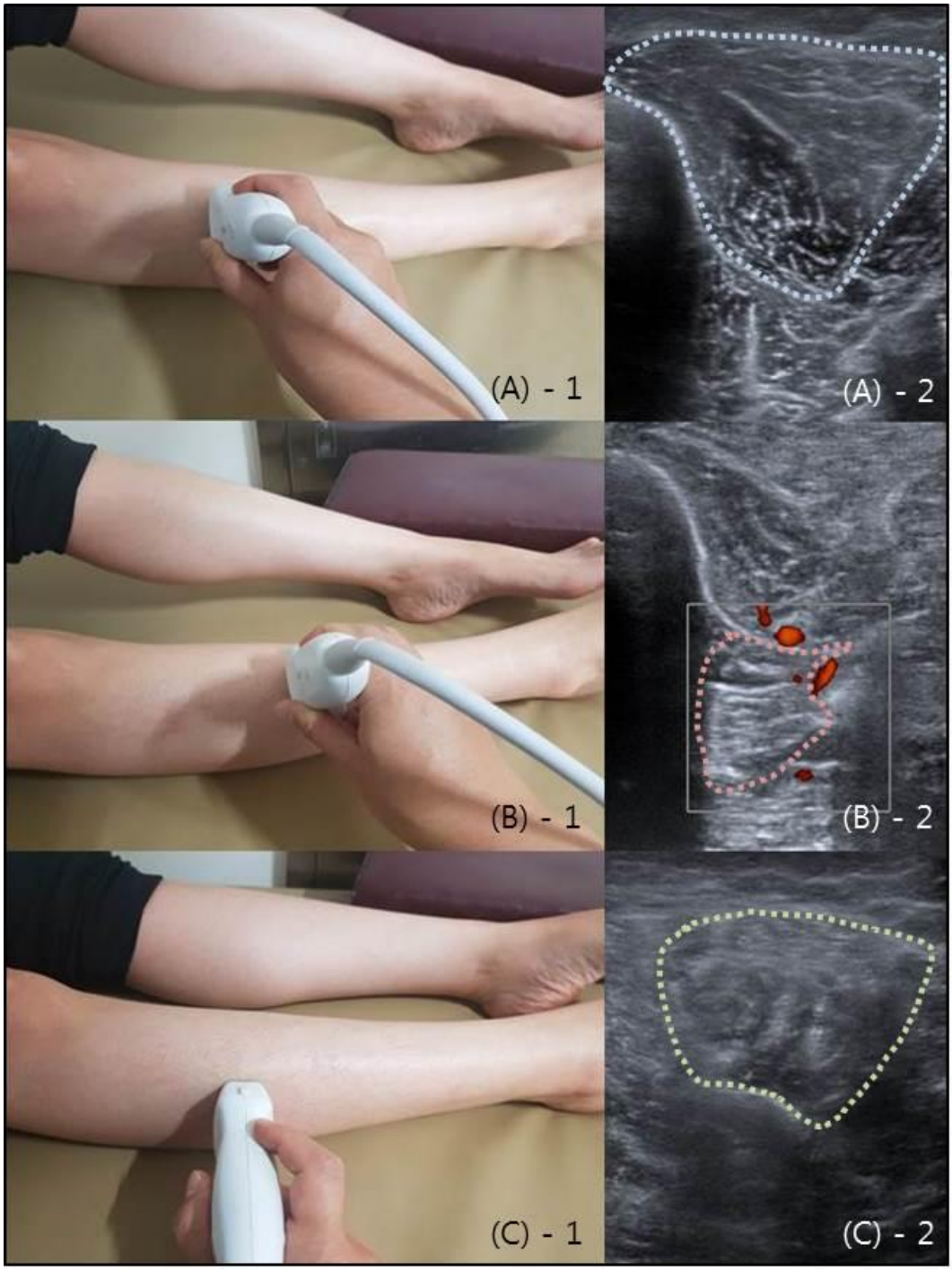

Figure 1. The scanned structures and probe position, and corresponding sample images. (A)-1 : probe position of TA, (B)-1 : probe position of TP, (C)-1 : probe position of PER, (A)-2 : scanned CSA of TA, (B)-2 : scanned CSA of TP, (C)-2 : scanned CSA of PER