

Cases of Immediate Improvement in Scoliosis Following Custom Insole application



Department of Rehabilitation Medicine, Kwangju Christian Hospital

Taegi Choi, Sunghoon Lee, Eunyoung Kang

Hyunkyung Lee, Younkyung Cho, Sumin Lee, Eunju Na, Joonwon Seo

Introduction

Scoliosis refers to a condition where the Cobb's angle (CA) on an antero-posterior view radiography is 10° or more. Among these cases, those without neuromuscular disease or structural causes in the spine are referred to as functional scoliosis. In this group, leg length discrepancy (LLD) or pelvic malalignment can contribute to scoliosis. It has also been found that the alignment of the foot can affect the pelvis. Based on this, efforts are made to prevent the progression of scoliosis by correcting the biomechanics of the foot and LLD using insoles. This article introduces cases where significant improvement in CA was observed immediately after wearing foot orthoses.

Case presentation

Both cases involve 8-year-old boys who presented with postural abnormalities. The results of the foot evaluation are summarized in Table 1.

In the first case, radiography revealed a CA of 12.9° of left lumbar and right thoracic scoliosis, with the pelvis showing left rotation, and a discrepancy of approximately 4mm in leg length (left leg longer). 4mm posting was prescribed on the medial aspect of right rearfoot.

In the second case, radiography showed a CA of 19.8° of left lumbar and right thoracic scoliosis, with left rotation and tilting of the pelvis, and a LLD of approximately 5.8mm(left leg shorter). 4mm posting on the medial aspect of the right rearfoot, a 2mm posting on the medial aspect of the left rearfoot, and a 4mm heel lift on the left side were prescribed.

Custom insoles were made to fit the shape of the patients' feet using casting foam. Three weeks after the completion of the insole fabrication, the patients began wearing them and radiography was repeated. In the first case, the CA, which was previously 12.9°, improved to 2.7° (Figure 1). In the second case, the CA improved from 19.8° to 6.1° (Figure 2).

	Case 1		Case 2	
	Right	Left	Right	Left
Forefoot	8°(varus)	10°(varus)	10°(varus)	14°(varus)
Rearfoot	20°(varus)	14°(varus)	30°(varus)	18°(varus)

Table 1. Table summarizing results of foot evaluation

Discussion

In the first case, relative pronation of the right foot induced left rotation of the pelvis, leading to scoliosis. Therefore, correcting the right foot would adjust the alignment of the pelvis.

In the second case, despite pronating the right foot relatively more to compensate for the shorter left leg, the pelvis exhibited a tilting towards the left, which may have been the cause of scoliosis. Since both feet were highly pronated, supination was applied to both, with greater elevation on the right, and a heel lift on the left was provided to address the leg length discrepancy.

In both cases, correction of foot biomechanics through insoles led to adjustments of the foot-limb-pelvis alignment, resulting in immediate improvement of scoliosis.

Furthermore, in this study, screening was conducted on approximately 200 children aged 6 to 13 years old, revealing that cases exhibiting immediate changes after insole wearing were predominantly found in the 8 to 9-year-old age group. Detecting abnormalities in this age group and attempting prevention through conservative treatments appears to be effective.

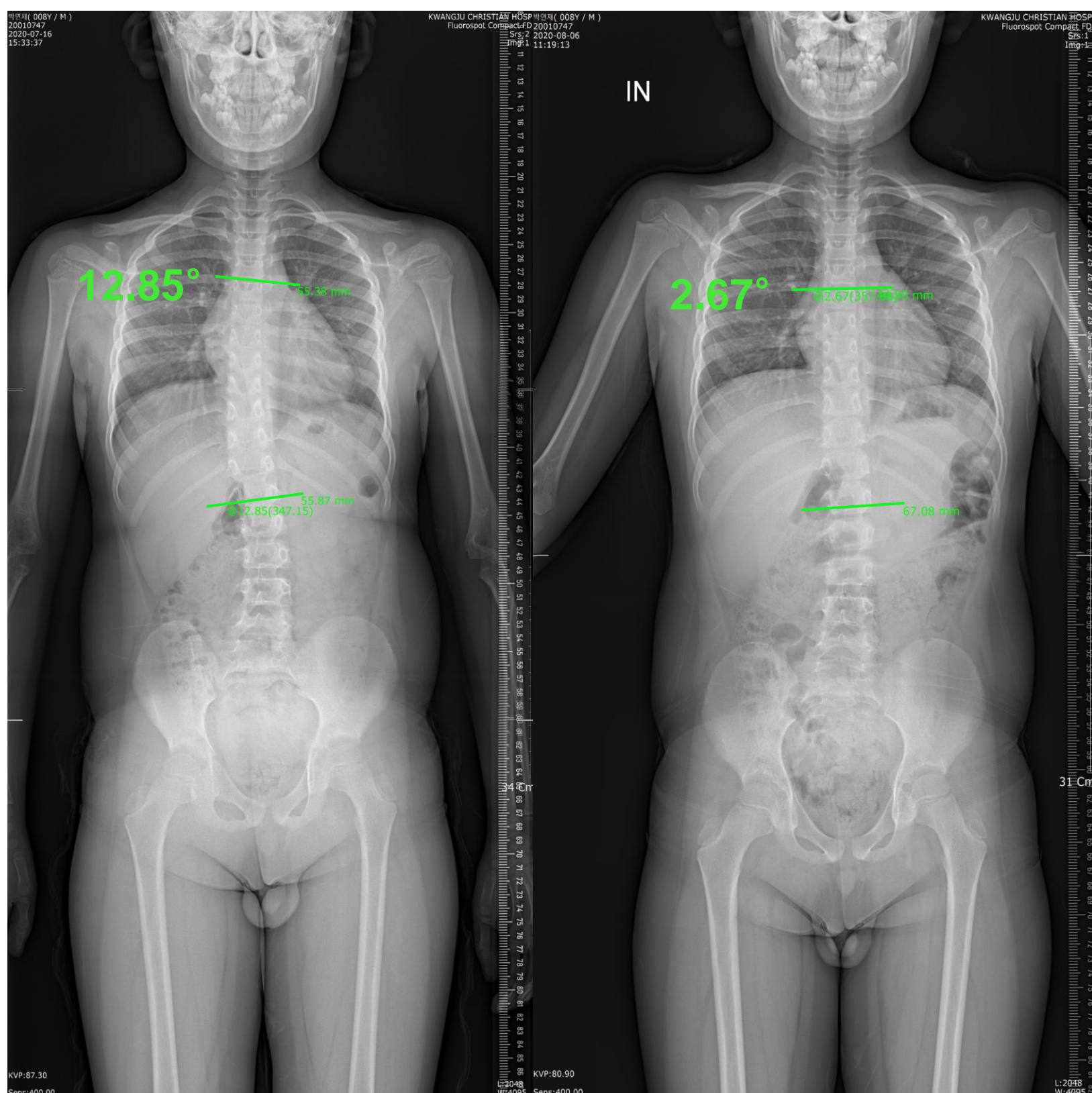


Figure 1. Image showing before(left) and after(right) custom insole application in first case

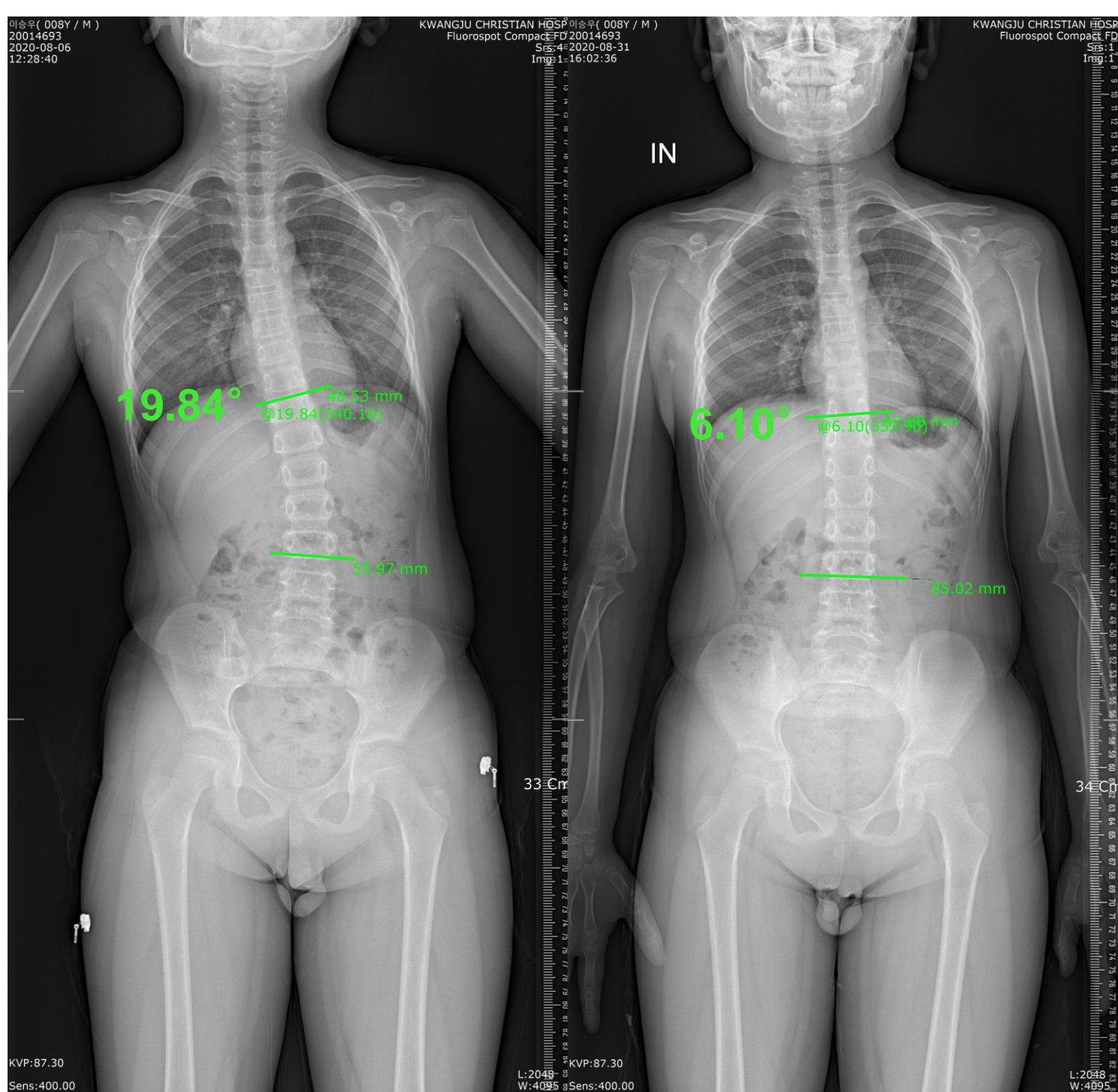


Figure 2. Image showing before(left) and after(right) custom insole application in second case