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Coronal decompensation of the trunk by means of a set of show lifts Coronal decompensation of the trunk by means of a set of shoe lifts

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Background

A shoe lift (SL) is often used in the treatment of scoliosis curves in two main cases: (1) an identified discrepancy of the legs' lengths in order to obtain a better balance of the pelvis or (2) a recognized improvement of some specific outcome, like the hump magnitude, when the SL is adopted.

Purpose

The purpose of this study is to measure the trunk pattern in response to the use of a SL (for this study, a series of SLs). In case of a pre-existing coronal decompensation, we observed the trunk reaction when the SL is respectively under the short leg.

Methods

We evaluated 27 consecutive patients (26 females and 1 male) who visited our Institute for spine diseases (scoliosis or hyperkyphosis). With the patient in a standing position, we performed a set of tests with a 3-dimensional rastereography (DIERS Formetric 4D) with different SL (5mm, 10mm and 15mm) placed alternatively under each foot. We assessed the variations of two important elements: the change of pelvic inclination and the change of the line that joins C7 and the middle of the sacral spine (C7-MSS). For simplicity, we divided the entire group of patients into two subgroups. One subgroup of patients (13) showed (in standing and normal position) a physiological inclination of the line between C7 and the center of the sacrum towards the right (average 7.08mm ± 6.79). The other subgroup of patients (15) showed a physiological inclination of the line between C7 and the center of the sacrum towards the left (average –12.13mm ± 8.58).

Results

We found that the use of the SL was not efficient for the improvement of C7-MSS. When the patients showed a physiological inclination of the spine towards the left, we expected a progressive improvement of this inclination if the patients used a SL under the left foot, and a relative worsening if the patients used a SL under the right foot. The situation was the same if the patients had a physiological inclination of this line towards the right. The results show a completely different pattern. Tables 1 and 2 below show the mean inclinations of this line, using the three SL:

Table 1

Physiological inclination of the spine towards the **right** (13 patients)					
S.L.under the right foot and relative inclinations					
S.L. 5mm	**6.62±6.5**	S.L. 10mm	**6.77±11.12**	S.L. 15mm	**7.38 ±8.18**
S.L. under the left foot and relative inclinations					
S.L. 5mm	**6.92±9.05**	S.L. 10mm	**8,54 ±9.29**	S.L. 15mm	**5.92±7.19**

Table 2

Physiological inclination of the spine towards the **left** (15 patients)					
S.L. under the left foot and relative inclinations					
S.L. 5mm	**-11.27 ±10.91**	S.L. 10mm	**-13.07 ±11.49**	S.L. 15mm	**-13.00 ±17.30**
S.L. under the right foot and relative inclinations					
S.L. 5mm	**-10.40 ±8.43**	S.L. 10mm	**-10.80 ±8.24**	S.L. 15mm	**-9.47 ±14.68**

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Conclusions and discussion

The use of a SL (5mm, 10mm and 15mm) positioned under each foot did not change the pattern of the inclination (theoretically, a reduction or an increase of the inclination of C7-MSS) measured in standing and normal positions. The spine seems to have an individual anti-gravity pattern that cannot be modified by the use of a SL.

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