

# EFFECTS OF SEMI-RIGID THORACOLUMBAR ORTHOSES WHEN TREATING SPINAL PAIN IN CASES OF OSTEOPOROSIS

## INTRODUCTION

Osteoporosis is a widespread condition that leads to an increased susceptibility to vertebral fractures. These fractures can cause significant pain and seriously restrict the quality of life for those affected. The use of semi-rigid thoracolumbar orthoses provides potential opportunities to improve spinal stability and alleviate pain. In this study, the effectiveness of the Spinova Osteo thoracolumbar orthosis was examined in the post-operative and conservative treatment of patients suffering from osteoporosis.

## METHODOLOGY

The study was designed as observational, non-interventional monitoring of development. It included 18 patients suffering from osteoporosis and stable vertebral fractures that were either treated conservatively or surgically. Patients were treated with the Spinova Osteo thoracolumbar orthosis after being diagnosed or undergoing surgery. Data was collected at two points in time: right after the orthosis was handed out (T0) and eight weeks after wearing the orthosis (T1). Parameters recorded included pain intensity, mobility, general health, feeling of confidence, and general assessment of the orthosis by patients.

## RESULTS

Demographic details: 15 women and 3 men took part in the study. The average age was 77.3 years.

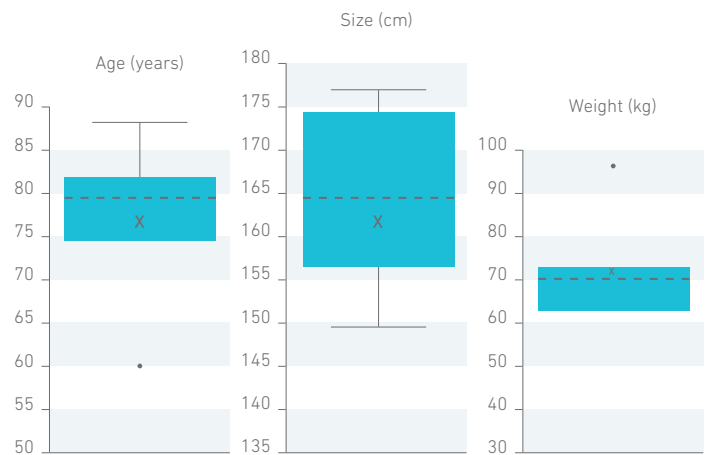


Fig.1: Box plots, patient age, height and weight, n=18

On a 10-point VAS scale, patients rated their spinal pain at a median of 7. (Min. = 4; 1st quartile = 4.5; median = 7; 3rd quartile = 8; max. = 10) (Fig. 3). 50% of patients reported experiencing pain at a level of between 7 and 10 on the scale. None of the patients rated their pain at less than 4.

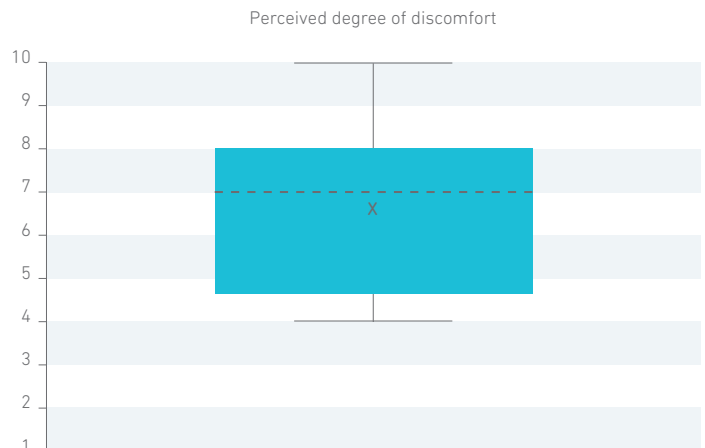


Fig.2: Perceived level of pain before treatment, VAS scale 1-10; 1 = no pain, 10 = extremely serious pain



## RESULTS

The majority of patients suffered from stable vertebral fractures. 14 of the 18 patients taking part were treated conservatively, 3 patients underwent surgery in the form of kyphoplasty. Information is missing for one patient. Full data was recorded for 11 of the 18 patients at both times, T0 and T1.

Treatment goals pursued by prescribing an orthosis included:

- Pain reduction
- Improvement of mobility
- Stabilization of the spine
- Muscle development
- Patients' feeling of confidence

Assessment whether the treatment goal was achieved comprised 4 categories: successful, predominantly successful, successful to a minor extent, not successful.

**Pain reduction:** In 90.9 percent of cases, significant pain reduction was noticed. Two patients reported complete freedom from pain, while pain was significantly reduced in the others.

**Mobility:** Mobility improved conclusively in 63.6 percent of patients. However, some patients noted that their mobility had improved to a minor extent only.

**Feeling of confidence:** Stabilization of the spine was rated as successful or predominantly successful in 81.8 percent of cases.

## RESULTS

The most important treatment goals for patients were pain reduction, stabilization of the spine, and improvement of mobility.

The treatment goals that were achieved most effectively were pain reduction and stabilization of the spine. Muscle development and improvement of mobility were less successful than the other treatment goals.

(An average value was not calculated for the treatment goals because, at four, the number of ordinal values was below the minimum required / recommended five values.)

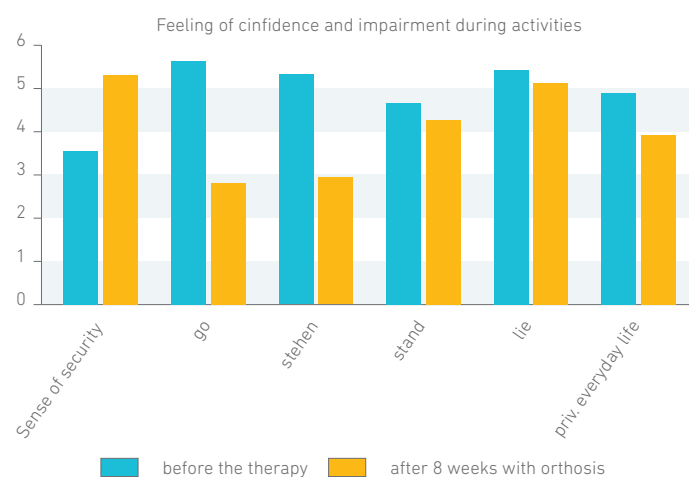


Fig.3: Feeling of confidence and impairment during everyday activities (y axis; 10-point VAS scale: 1 = very confident to 10 = not at all confident; 1 = not impaired to 10 = highly impaired)

Using the perceived level of pain (Fig.2) and VAS values (Fig.3), we were able to derive that patients suffered from serious impairment during everyday activities. Following eight weeks of orthosis treatment, there is a clear tendency showing that patients wearing an orthosis are much less impaired and can walk, stand, as well as perform everyday activities better, and feel more confident. However, the orthosis barely has any effect when patients are lying or sitting.



## CONCLUSION

The study shows that the semi-rigid SpinoVA Osteo thoracolumbar orthosis is an effective method for pain reduction and stability improvement in patients suffering from osteoporosis and stable vertebral fractures. Patients reported noticing a significant improvement in their general health and their feeling of confidence during everyday activities.

None of the 11 patients suffered any adverse reactions caused by the orthosis for the wearing duration of 8 weeks. No adverse events occurred either. In conjunction with the patients' positive feedback, the SpinoVA Osteo can be regarded as a safe and effective addition to conservative and post-operative treatment of vertebral fractures in cases of osteoporosis. Further studies with a larger patient population are desirable to substantiate the results and examine the long-term effects of the orthosis.

We would like to thank Gera SRH-Waldklinikum Hospital for Spinal Surgery and Neurotraumatology as well as the Center for Clinical Studies for conducting the study.

### CONCLUSIONS

- reduces pain
- increases the patient's sense of security when walking and standing
- makes everyday activities easier