CoxaTrain®

CONSERVATIVE TREATMENT OF HIP PROBLEMS USING THE CoxaTrain® ORTHOSIS

INTRODUCTION

Osteoarthritis is the most common joint condition in the world. During advanced stages in particular, it results in pain and loss of joint movement.

The percentage of those suffering from osteoarthritis significantly increases with age; from the age of 65, almost half of all women in Germany (48.1%) and nearly a third of men (31.2%) are affected.[1] The development of effective conservative treatment strategies is key because joint replacement, in cases of osteoarthritis of the hip for example, is only indicated in the final stage. Hip orthoses are a possible element in the conservative treatment of osteoarthritis of the hip.

This non-interventional study was conducted with the goal of evaluating the clinical outcome for patients with regard to pain reduction, joint stability, and mobility. Data collection also included the situations in which the orthosis was worn, what patients thought about wearing comfort, and how easily everyday activities could be performed.

To this end, patients suffering from different severities of osteoarthritis of the hip were conservatively treated with a flexible hip orthosis.

METHOD

From June 2022 to November 2023, 57 patients (34 women/ 23 men) with hip pain were conservatively treated with the CoxaTrain orthosis.

44 patients were diagnosed with osteoarthritis of the hip, six had coxalgia. Three patients were diagnosed with impingement of the hip joint, three with trochanteric bursitis, and one patient with labrum lesion. Some patients were diagnosed with several conditions, such as additional muscle imbalance, a feeling of instability, and/or hip dysplasia or osteoarthritis of the hip together with impingement of the hip joint.

19 patients took analgesics before participating in the study, 13 patients underwent physiotherapy. Nine additionally took part in rehabilitation exercise. A third each of nine patients were treated with shockwave therapy, infiltration therapy, or acupuncture.

When data was collected, the treating physicians asked patients about treatment goals. The three most common goals for the conservative treatment of osteoarthritis of the hip included: reducing pain, relieving the hip joint, and maintaining mobility. (Fig. 1)

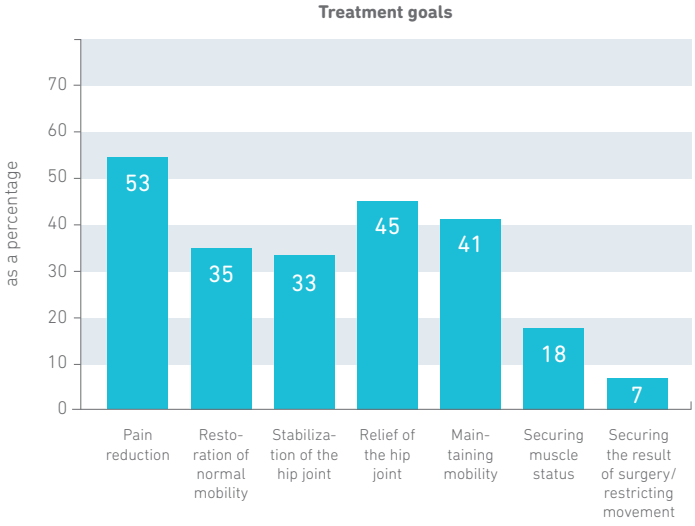

Fig. 1: Treatment goals, treating physicians' assessment, several answers possible

During the patients' follow-up appointment, physicians were asked how effective they thought treatment using the hip orthosis was, on a scale of 1 = excellent to 5 = poor.

Achieving the three most common treatment goals was rated by physicians as 1.9 on average. The four additional treatment goals were rated as 2.0. to 2.2 on average.

RESULTS

The investigation period for each patient using the orthosis was 7.6 weeks on average. Patients stated that they wore the orthosis for an average of 4.6 hours per day.

When asked in which situations patients donned the orthosis (several answers were possible), 49.1% said during their leisure time, 21.1% wore it the entire day, 38.6% at work, 19.3% during exercise, and 1.8% at night. (Fig. 2)

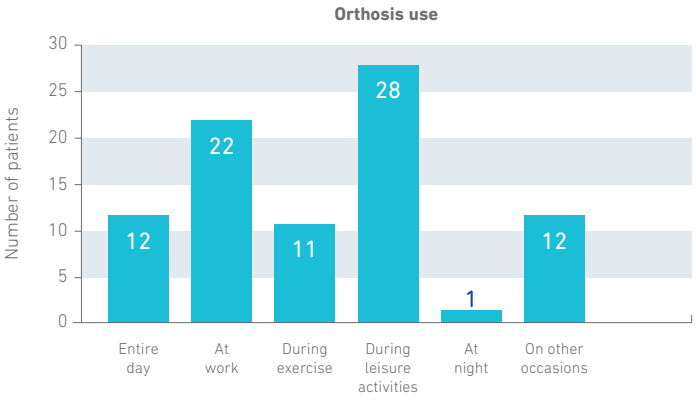

Fig. 2: The diagram shows in which situations the orthosis was worn. (Patients n total = 57, several answers were possible)

Pain perception was recorded using a 10-point VAS scale. Pain reduced by an average of 3.1 points, from 6.5 to 3.4. This represents a pain reduction of 47.7%. (Fig. 3)

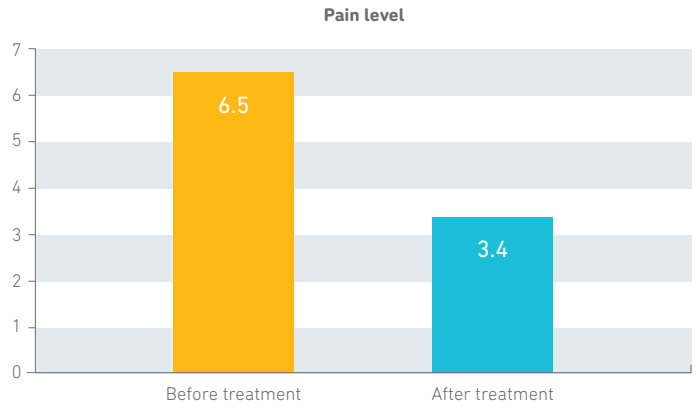

Fig. 3: Pain perception rated on a 10-point VAS scale; 0 = no pain to 10 = extremely serious pain

27 patients regularly took pain medication.
13 of these were able to reduce the amount of pain medication during treatment, thanks to the orthosis, seven stayed with the same amount. Seven patients did not provide information.

22 patients (38.6%) stated that the orthosis provided good to very good support and confidence during treatment. 11 patients (19.3%) felt it was satisfactory, 14 patients (24.6%) adequate, four patients (7%) felt they were not supported very well.

The following assessments were made on a 10-point VAS scale:
the feeling of stability when walking on even, firm ground improved by an average of 2.3 points on the scale with the orthosis.
The feeling of stability when walking on uneven ground increased by an average of 2.6 points.
The feeling of stability when walking downstairs improved by an average of 2.5 points with the orthosis.
The feeling of stability when standing improved by an average of 2.1 points on the scale with the orthosis. (Fig. 4)

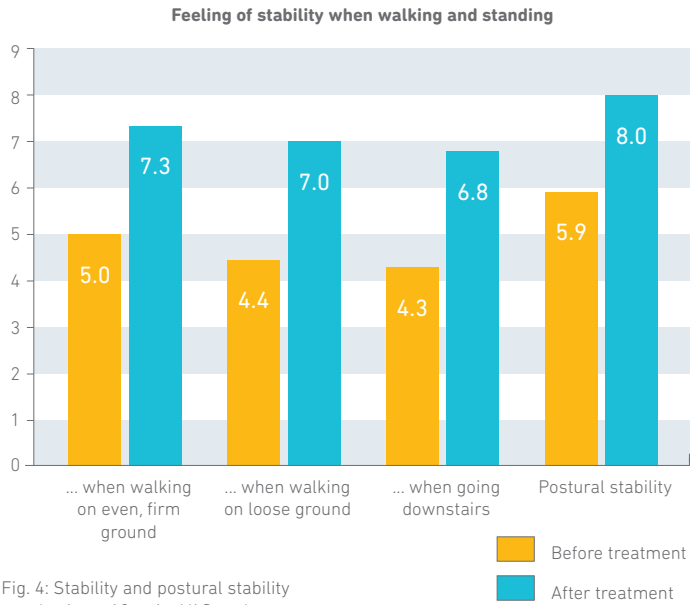

Fig. 4: Stability and postural stability rated using a 10-point VAS scale, 0 = very bad feeling to 10 = very good feeling

When asked about the estimated maximum walking distance without pain, the following statements were made:
The walking distance without pain was rated as 4.1 on a 10-point VAS scale without the orthosis (0 = short/10 = long), with the orthosis, the average was 6.6 – which is an additional 61%.
Wearing the orthosis increased the pain-free walking distance significantly (no figure).

When asked: "How good is your mobility during everyday and leisure activities?", patients stated an average of 4.2 without the orthosis and 7.2 with the orthosis on a 10-point VAS scale. This represents an improvement in mobility of 71.4%. (Fig. 5)

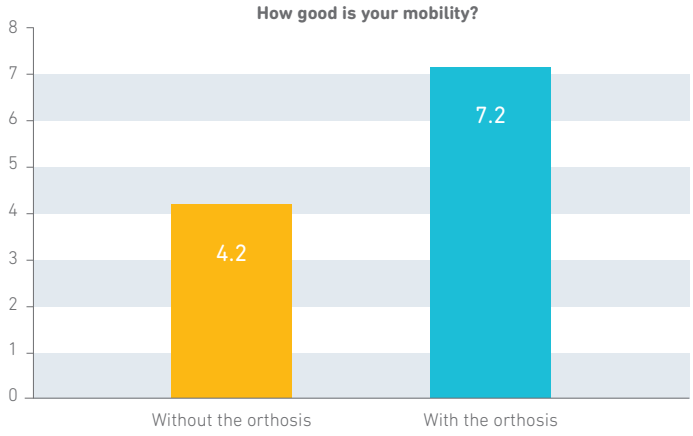

Fig. 5: Mobility rated using a 10-point VAS scale,
0 = very bad to 10 = very good

RESULTS

During gentle everyday activities and activities that subject the body to more strain, patients faced major limitations before being treated with the orthosis.

Patients gave a rating of 5.1 on average for gentle activities without the orthosis. With the orthosis, the situation improved to 6.9, which represents an additional 35.3%. Everyday activities that subject the body to more strain were rated as 4.4 without the orthosis and as 6.2 with the orthosis, which is an additional 40.9% (Fig. 6).

The orthosis helps perform everyday activities better with noticeably fewer limitations.

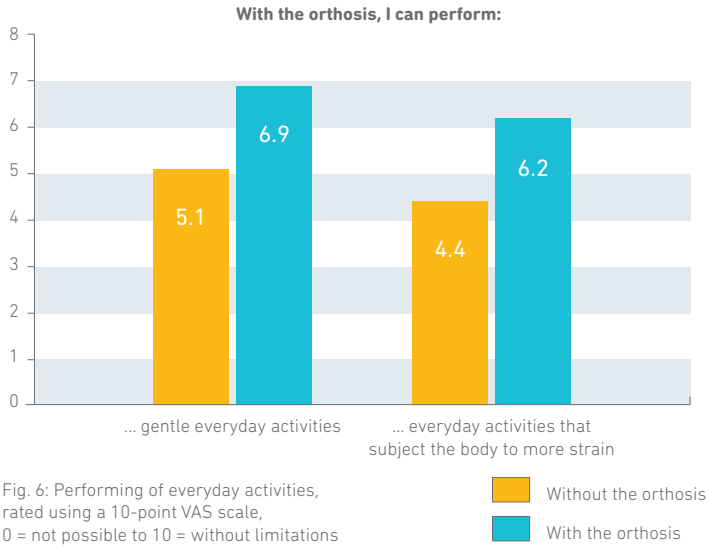

Fig. 6: Performing of everyday activities,
rated using a 10-point VAS scale,
0 = not possible to 10 = without limitations

Handling/donning of the orthosis was perceived as easy to very easy by 70.2%, as without problems by 17.5%, and as strenuous to problematic by 12.3%. Nobody thought it was very difficult.

The fit and non-slip properties of the orthosis during movement were rated as good to excellent by 57.9%, as standard by 33.3%, and by 8.8% as not very good. Nobody rated them as poor.

Patients rated the wearing comfort with regard to breathability as 2.4 on average, skin friendliness as 2.3, and weight of the orthosis as 2.3. (Fig. 7)

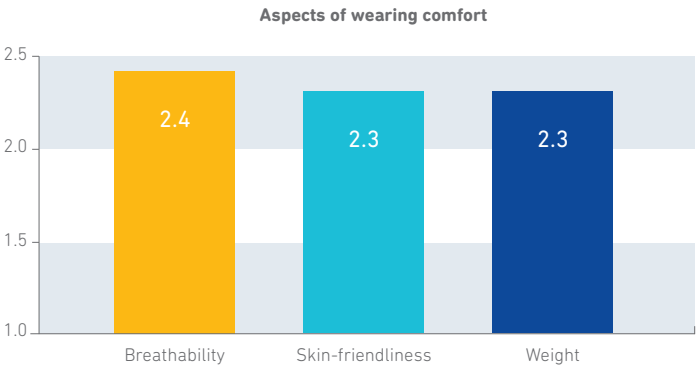

Fig. 7: Assessment of wearing comfort on an ordinal scale from 1 to 6, 1 = excellent to 6 = not adequate

ADVERSE REACTIONS, ADVERSE EVENTS

None of the 57 patients suffered any adverse effects caused by the orthosis for the wearing duration.

CONCLUDING OBSERVATION:

In order to guarantee the efficiency of orthoses as a treatment option, patients must be educated. Patient education should include information about goals and modes of treatment as well as about possible risks and adverse reactions. Patients should be encouraged to get in touch with the relevant medical specialists if an adjustment is required, in cases of intolerances, or if they have questions about the medical aid.[2]

During conservative treatment of osteoarthritis of the hip, the use of hip orthoses is designed to reduce pain, for example. A clinical study (Evidence Level 1b) substantiated that the CoxaTrain reduced pain at night as well as during the day.[3] The patients in this study also noticed significant pain reduction when using the CoxaTrain.

Another treatment goal is the improvement of hip functionality and the associated ability to carry out everyday activities independently and entirely. Patients who underwent conservative treatment using the CoxaTrain confirmed an improved feeling of stability as well as increased mobility. Furthermore, they were able to perform everyday activities more easily with the orthosis. These results correspond to the results of the clinical 1b study that has already been conducted. Patients suffering from moderate osteoarthritis of the hip showed that their mobility improved over time when wearing the CoxaTrain. Stride length as well as walking speed significantly increased, with an increased maximum extension moment being recorded.[3] Gait normalized when the hip orthosis was worn.[4]

Because the product is "inconspicuous" and does not cause adverse effects, this study also demonstrated that **using the CoxaTrain is low-risk, in addition to its proven effectiveness**.

Further data acquisition is desirable to confirm the existing findings.

CONCLUSIONS

- → Pain reduction by an average of 47.7% with the CoxaTrain
- → Significant improvement of patient mobility by 71.4%
- → The CoxaTrain provides an excellent feeling of stability
- → The CoxaTrain offers exceptional wearing comfort

Sources:
[1] Judith Fuchs, Ronny Kuhnert, Christa Scheidt-Nave; 12-Monats-Prävalenz von Arthrose in Deutschland. Journal of Health Monitoring · 2017 2(3) DOI 10.17886/RKI-GBE-2017-054 Robert Koch-Institut, Berlin
[2] Johann Beaudreuil; Orthoses for osteoarthritis: A narrative review. Ann Phys Rehabil Med. 2017 Apr;60(2):102-106. doi: 10.1016/j.rehab.2016.10.005. Epub 2016 Dec 6.
[3] Steingrebe H, Stetter BJ, Sell S, Stein T; Effects of Hip Bracing on Gait Biomechanics, Pain and Function in Subjects With Mild to Moderate Hip Osteoarthritis. Front. Bioeng. Biotechnol. (2022)10:888775. doi: 10.3389/fbioe.2022.888775
[4] Nérot, A., et al.; Clinical study on the unloading effect of hip bracing on gait in patients with hip osteoarthritis; Prosthetic and Orthotics International_41_2_127-133_2017