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## **PERCEPTIVE AND REHABILITATIVE MUSCLE RECRUITMENT FACILITATION SECONDARY TO THE USE OF A DYNAMIC AND ASYMMETRIC SPINE BRACE IN THE TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)**

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Five patients affected by Adolescent Idiopathic Scoliosis were recruited for the aim of this study. Each patient underwent a first task-specific evaluation at time T0 and T1 and a secondary experimental course at time T2, T3 and T4. After a first postural and total spine X-ray evaluation, recruited patients began to use our innovative spine brace called BRIXIA (time T0 and T1). During the second experimental phase, a SEMG bilateral activity of the trunk large rhomboid, the latissimus dorsi and the quadratus lumborum was investigated without spine brace, by using a common Chenéau brace and afterwards the dynamic BRIXIA spine brace, with the acquisition of the so-called RMS EMG Ratio value. The SEMG measurements were acquired in six study conditions: SiRP; SiRCP; StRP; StRCP; BA. At the end of this SEMG evaluation, each patient received the final version of the BRIXIA spine brace and began a postural rehabilitative treatment course (time T2). At time T3 and T4 a second and third SEMG assessment was made without using a spine brace and by using BRIXIA. Finally, functional, radiographic and postural evaluations were made to define and quantify an amelioration and modification of patient's postural attitude. We observed at time T2 an homogeneous grade of paraxial muscle recruitment acquisition, expressed by the RMS EMG ratio index, without using spine brace (53, 3%) and by using Chenéau and BRIXIA brace (46, 7%); specifically, a (57, 14%) of our patients used BRIXIA brace and a (42, 86%) Chenéau brace at time T3, an homogeneous grade of symmetric paraxial muscle recruitment activity, expressed by the RMS EMG ratio index, was observed by using BRIXIA brace (56, 7%); all patients recruited (100%) showed in SiRCP study condition the most homogeneous and symmetric paraxial muscle recruitment by using BRIXIA brace; at time T4, an immo-dification of the grade of symmetric paraxial muscle recruitment acquisition, expressed by the RMS EMG ratio index, was observed in a 56, 7% of patients who were using BRIXIA. In a comparative and time-related analysis between our clinical and RMS data, Cobb angle trend showed a statistical significant correlation with RMS data, acquired at time T4 in BARC condition and without BRIXIA brace, and similarly with RMS data acquired at time T4 with BRIXIA brace. In line with the Visual Postural Analysis Trend, our rehabilitative model showed a sensible capacity to modify patient's individual sense of posturality, to increase the acquisition of cross-linked self-correction strategies and to induce a progressive rebalancing between the anterior and posterior kinetic muscle chains recruitment.

## **BIOGRAPHY**

Maurizio Falso received his Degree of Medicine in 1999 and his specialization in Physical Medicine and Rehabilitation from the University of Medicine of Verona, Italy in 2004 followed by a post-specialization research on the management of spasticity and movement disorders at the Department of Neurological Sciences and Vision of the University of Verona, Italy by using botulinum toxin and baclofen pumps and analyzing motor patterns with video-surface EMG. He is a Professor at the Physiotherapist School of the Medicine University of Brescia, Italy and a past-member of the Italian Consensus Table on the use of xeomin in adult spasticity. In his career he also promoted the use of innovative dynamic carbon-kevlar custom made AFO (DAFONS), innovative postural devices in patients affected by neurological complex postural needs, the device treatment of idiopathic scoliosis by using an innovative dynamic spine brace called "BRIXIA" and the device treatment of gait disorders by using an innovative dynamic carbon kevlar foot insole called "PRODYNAMIC".

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