



Conservative Treatment of Idiopathic Scoliosis- A Case in Long-Term Follow-up

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Abstract

Aim: Retrospective assessment of the conservative brace and improvement treatment effectiveness, on the selected example of a person with adolescent idiopathic scoliosis.

Case: The study was conducted basing on a documentation review from the latest 13 years of the patient's diagnosed with two arc scoliosis (AIS): right-sided chest (primary curve, Cobb angle = 33°, AVR = 5), left-sided lumbar (secondary curve, Cobb angle = 21°, AVR = 10). Within 11 years, we used both systematic brace and improved treatment (Cheneau Brace) with the use of the active three dimensional curvature correction (DoboMed' Method).

Results: Over the period of 13 years of observation we have recorded improvement in the majority of variables in radiological examination. The curvature angle of the thoracic spine decreased by 12°, in the lumbar region of 9° in comparison to initial value. In the parameters of the spine axial rotation was observed rotation reduction by 3° in the thoracic and decrease in the lumbar region by 2° has been observed.

Conclusion: Conservative treatment according to the methods recommended by the society SOSORT reduces the risk of scoliosis progressive development. For the positive effects of the treatment is both the systematic treatment and support from the family of the patient are extremely important.

Introduction

Adolescent idiopathic scoliosis is a three dimensional deformation of the spine, which causes a change in the symmetry of posture. In the transverse plane the vertebrae rotation and the thoracic influences the formation of the rib projection on the convex curvature side [1]. The corrective impact focused on vertebrae peak derotation, increasing the ribs mobility on the concave curvature side has the basic importance in the conservative treatment of idiopathic spinal curvatures and respiratory disorders associated with them [2-4]. The aim of the publication is to present the history of patients with juvenile idiopathic scoliosis, treated conservatively both with specific kind of physiotherapy and brace. The presented case is a person who has already completed conservative treatment of scoliosis.

Case Presentation

Patient

JB (girl) was born in November 1988. Scoliosis was diagnosed exactly in 12 years old patient (November 2000). Earlier in her family doctors also diagnosed scoliosis at her mother and aunt. The patient's menarche was at the age of 11, a few months before the diagnosis of scoliosis. Within two years, was observation conducted and was a used physiotherapeutic scoliosis specific exercise (PSSE). The patient from November 2002 began to apply corrective brace - Cheneau type. At the age of 16 they started to use specific physiotherapy using DoboMed' method.

The patient was hospitalized eight times (2004-2009, 2011, 2013), to apply a stationary intensive rehabilitation (SIR). At that time the following variables were recorded: kyphosis, lordosis, the angle of trunk rotation, weight, height, (Table 1). In the posture study she was monitored, throughout the period of treatment, using the same method of measurement, the thoracic kyphosis and lumbar lordosis values (V-Plurimeter) and the trunk rotation values measured by scoliometer [5,6]. There is no reliable data on the frequency of wearing a brace 2002-2004. Probably the brace was worn for 8-12 hours daily. Since 2004, the brace was between used 14-16 hours a day, and physiotherapy 1-3 times a week. In the period between 2005 and 2008, the brace has been used approx. 12 hours a day.

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Table 1: Study variables measured during the stationary intensive rehabilitation.

Variables	07.2004	11.2005	09.2006	07.2007	07.2008	08.2009	07.2011	02.2013
Kyphosis [°]	18	22	28	28	27	28	30	32
Lordosis [°]	27	26	28	32	28	28	32	38
C-Th sin ATR [°]	2	2	3	2	2	1	3	3
Th dx ATR [°]	7	7	10	8	6	5	5	5
L-sin ATR [°]	5	7	6	5	3	4	3	4
Weight [kg]	52	50	51	50	51	53	53	49
Height [cm]	163	165	166	166	167	167	167	167

ATR- the angle of trunk rotation

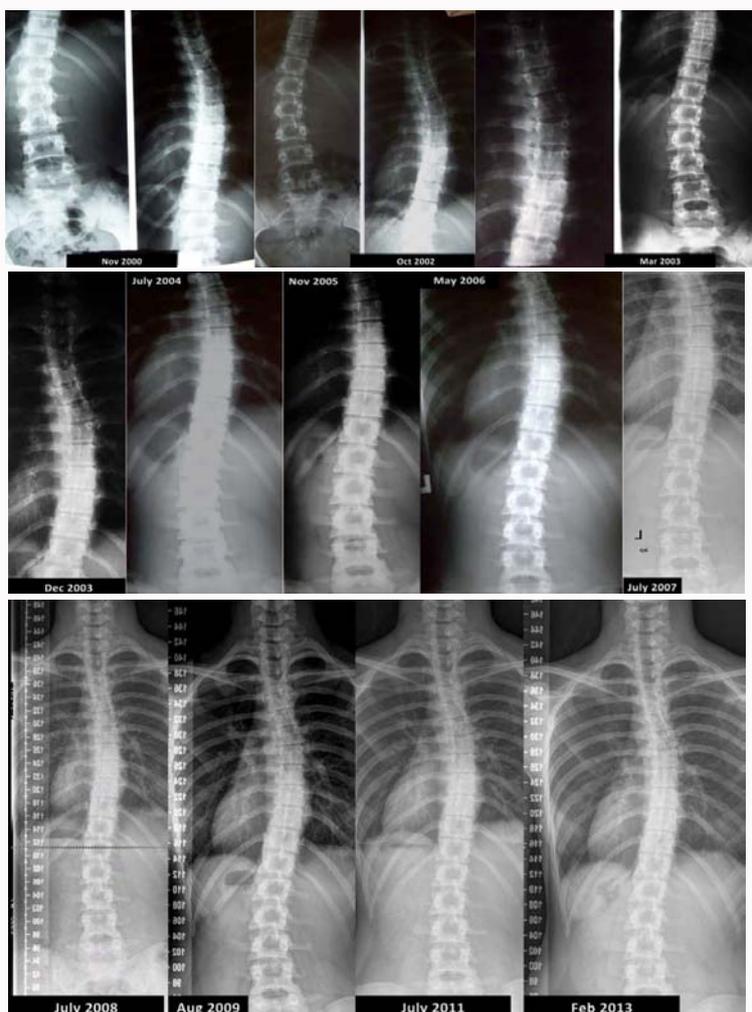


Figure 1: X-ray examination-follow up period (2000-2013).

Since 2009, they began to withdraw the brace, limiting its use only for the night, and exercise once a week. In 2011, they discontinued the use of the brace and exercises were upheld. Exercises were applied three times a week. In 2013, they finally completed the treatment.

Treatment

Corrective brace - Cheneau type: The Cheneau brace is the most widely used in Europe. It is preferable to use the orthosis curvature of the spine between 20 and 45 degrees. The Cheneau brace creates pressure on the convexity of the curve, and, on the

opposite side are wide expansion chambers in the frontal, sagittal, and horizontal planes. The Chêneau brace has been found to prevent curve progression and to decrease axial rotation of spine. It is made of thermoplastic material. Each brace is made individually for a patient. This orthosis should be removed only for toileting and physiotherapy process [7,8].

DoboMed: DoboMed method is used in the conservative treatment of idiopathic scoliosis. It is based on the active three dimensional curvature correction in specific symmetrical positions

output by "asymmetric" respiratory track, which occurs as a result of the chest active mobilization on the side of concave and convex curvature. Activity is focused on vertebral peak curvature height. In the inspiratory phase proprioceptive stimuli is applied to the concave side of the curvature, whereas in the expiratory phase – exteroceptive stimuli to the convex side of the curvature. The patient in each position makes the active correction of posture by a symmetrical adjustment of the shoulder girdle, pelvic girdle, and trunk, as well as the upper and lower limbs. The correction also appears in the sagittal plane by thoracic kyphosis and determination in the neutral position of the lumbar spine [3,5,9,10]. As a result of "asymmetric" respiratory track, there is a chest mobilization, rib – vertebrate joints mobilization on the side of the concave curvature and the intervertebral joints mobilization, resulting in vertebrae derotation. The therapy of DoboMed method was conducted by certified therapists who had 10 years of experience in clinical work with scoliosis.

Discussion

Changes in the X-ray study are shown in (Figure 1). The picture were taken in November 2000 with the recognition, it presented right-sided thoracic scoliosis Cobb 33°, AVR 5 and the left-sided lumbar scoliosis Cobb 21°, AVR 10. At the inclusion brace treatment (October 2002) scoliosis reached the following values Th dex Cobb 38°, AVR 5 and L sin Cobb 25°, AVR 7. Until March 2003 through the use of the brace obtained a slight curvature reduction - Th dex Cobb 26°, AVR 9 and L sin Cobb 22°, AVR 3. Systematically conducted conservative treatment succeeded in curvature reduction in July 2008 to the following values - Th dex Cobb 17°, AVR 14 and L sin Cobb 15°, AVR 4. In the last X-ray picture in February 2013 after the completion of conservative treatment, the following curvature values - Th dex Cobb 21°, AVR 2, and L sin Cobb 12°, AVR 8 have been found. In 2000, 2002 and 2003 for technical reasons it was impossible to perform one long X-ray of all segments of spine. In those years separate images of the lumbar and thoracic spine were made. Although it was necessary to take two pictures of the spine, it was possible to measure the angle of the Cobb. Another limitation of the study was the lack of data on kyphosis and lumbar lordosis values and angle of trunk rotation values in the years 2000 to 2004. Systematic review of interventions gives us interesting information. There is a lack of high-quality evidence to recommend the use of physiotherapeutic scoliosis specific exercises for AIS [11]. However there is evidence of efficacy of Cheneau 'brace to avoid surgery and reduce the progression of scoliosis [8,12]. In our case, we can see the variability in the measurements of Cobb angles during 13 years. Between 2011 a 2013 the angle of trunk rotation did not change significantly. The given therapy ranges, specific physiotherapy and the use of a brace are the information coming from the history of the patient and her parents. Unfortunately, it was not possible to objectify the patient's cooperation for technical reasons (lack of access at the time of sensors assessing the brace wearing time and pressing force). In spite of the fact that the declarative values showed sometimes a relatively little involvement of the patient, the total assessment of the cooperation and her commitment to her treatment process lasting 13 years is high. Presented clinical example shows that, despite large loads (family history), and the relatively late start of treatment, using

appropriate methods of conservative treatment and cooperation, can be obtained relatively good results of idiopathic scoliosis treatment can be obtained [13,14].

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