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**Original Research Article**

# Rate of surgery in patients treated with a Chêneau light brace using the SRS inclusion criteria

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**ABSTRACT**

**Introduction:** Studies investigating the outcome of conservative scoliosis treatment differ widely with respect to the inclusion criteria used. Prospective cohort studies are available using the Scoliosis Research Society (SRS) inclusion criteria for studies on bracing. These seem to provide a great advantage in comparing different strategies of bracing against each other. Because we had gathered all data pertaining to patients treated with a Chêneau light brace between June 2005 and November 2007, it was possible to identify that sample of patients fulfilling the SRS inclusion criteria from the entire sample.

**Aim:** The aim of this study was to investigate treatment outcomes in patients treated with Chêneau light brace, who met the SRS inclusion criteria for studies on bracing.

**Materials and methods:** In total, 34 patients (of 152) fulfilled the SRS inclusion criteria having an average age of 12.06 years (10–13 years), an average Cobb angle of 31° (25–40°), an average Risser stage of 0.35, an average in-brace Cobb angle of 13° (i.e., 59% of in-brace correction). There were 17 thoracic, 10 double major, 6 lumbar and 2 thoracolumbar curve patterns. After a change of workplace concerning the first author, patients could not be followed up on as originally planned. Therefore, telephone interviews were performed by the second author.

**Results:** In total, 28 patients (average age of 16.5 years) have been contacted, 9 of them still undergoing their treatment. No patient has been operated on (rate of surgery is 0%) and only 1 was not satisfied with the cosmetic outcome of the treatment.

**Discussion:** The rate of surgery was far less than reported in recent studies using the same inclusion criteria even when all drop outs were rated as failures.

**Conclusions:** The rate of surgery can be reduced with the help of Chêneau braces of the latest standard and satisfactory in-brace correction. Brace treatment employing the Chêneau brace seems to be effective and, therefore, is clearly recommended. Clinical outcomes may be more important for a patient than radiological outcomes.

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## 1. Introduction

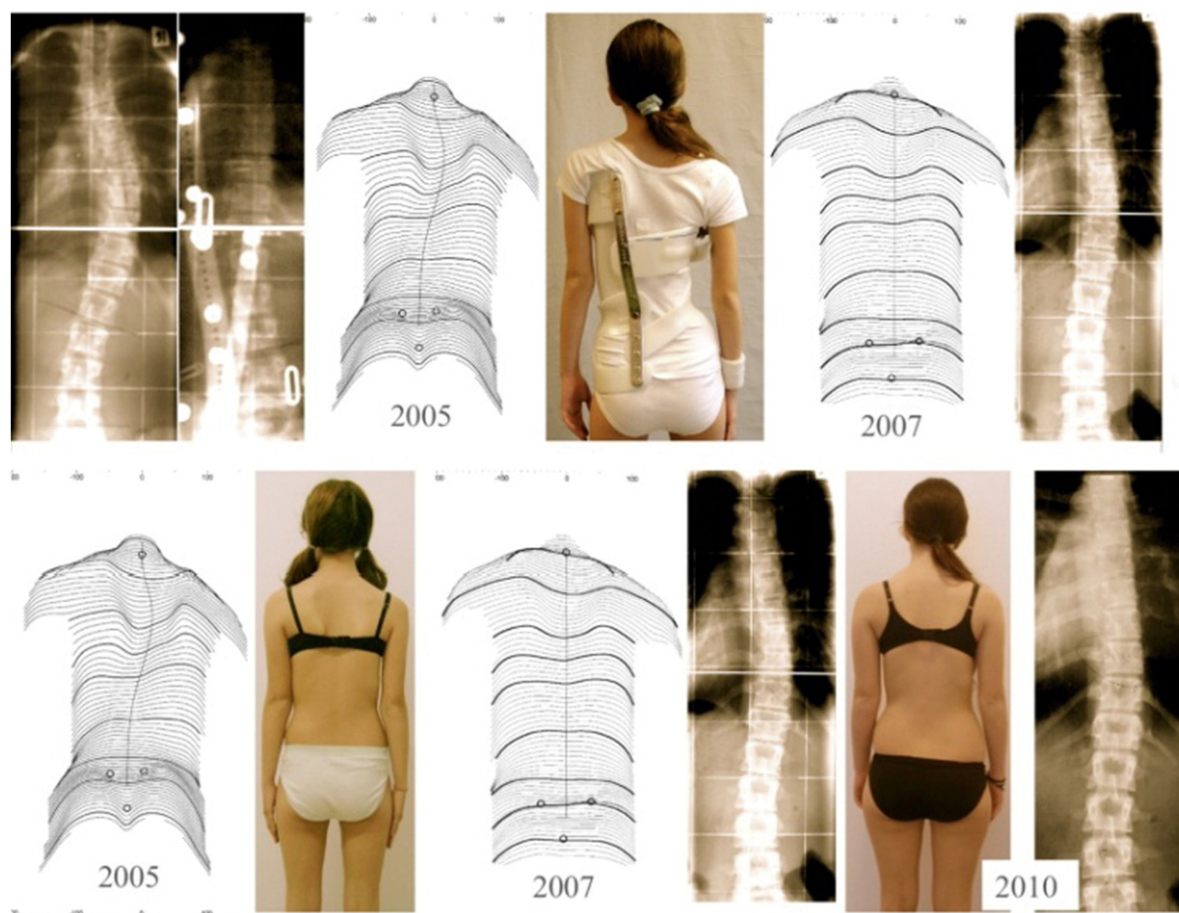
According to the latest review of literature, brace treatment in patients with scoliosis has to be regarded as being an evidence based treatment.<sup>15</sup> Several bracing concepts are utilized today for the treatment of scoliosis and the in-brace corrections accepted as sufficient vary widely. The plaster cast method of brace construction seems to be the most practiced technique worldwide for the construction of hard braces at the moment. Computer aided design (CAD) systems are available, which allow for brace adjustments without plaster. Another development, however, is the ScoliOlogiC off the shelf system enabling the certified prosthetist and orthotist (CPO) to construct a light brace for scoliosis correction from a variety of pattern specific shells to be connected to an anterior and a posterior upright.<sup>27</sup> This Chêneau light brace, constructed according to the Chêneau principles, promises a reduced impediment to the quality of life in this brace. The correction effects for the first 81 patients (main diagnosis: adolescent idiopathic scoliosis (AIS) – 64 cases or early onset scoliosis (EOS) – 15 cases), treated

according to the principles of the Chêneau light brace have shown a satisfactory in-brace correction exceeding 50% of the initial Cobb angle.<sup>29</sup>

Although the effectiveness of brace treatment has been questioned,<sup>9</sup> there is evidence that brace treatment can stop the curvature progression<sup>5,8,12,13,15,16,21,23,26,32,40,41</sup> (Fig. 1), reduce the frequency of surgery<sup>7,14,20,24</sup> and improve cosmetic appearance.<sup>17,18,19,28,38</sup> Poor cosmetic appearance may be the most important problem for the patient. This problem can be solved or at least reduced through the use of advanced bracing techniques including the best possible correction principles available to date.<sup>38</sup>

The Chêneau light brace was developed to make the brace lighter, finer, easier to wear, and through this, to allow for a better quality of life for scoliosis patients under brace treatment. This is accomplished by using less material in comparison to traditional bracing systems intended for scoliosis treatment (Fig. 2).

Many 3-point pressure systems are applied on the frontal, the coronal and the sagittal plane. An expansion void is implemented opposite every pressure area. This enables the desired



**Fig. 1** – Example of a patient with an initial overcorrection in a Chêneau light brace. *Upper line:* Overcorrection of a thoracic curve from  $38^\circ$  to  $-14^\circ$  in a T2 “Chêneau light” model in an 11-year old premenstrual girl with Tanner II displayed in the left three pictures. After 2 years of treatment the curve without the brace on was corrected to  $19^\circ$ . *Lower line:* Patient with the complete documentation – images to the left (2005) at the start with  $38^\circ$ , images in the middle (2007) show a compensated appearance with  $18^\circ$  and, finally, images to the right (2010) after weaning off (at 16 years of age) with a balanced clinical appearance and the curve of  $12^\circ$ . There was no change in July 2011.

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