Reviewer's report

Title: A new brace treatment similar for adolescent scoliosis and kyphosis based on restoration of thoracolumbar lordosis. Radiological and subjective clinical results after at least one year of treatment.

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Reviewer: Hans-Rudolf Weiss

Reviewer's report:

Major Compulsory Revisions

The ms. has major deviations from the requirements as presented in the 'Instructions for authors' section provided by Scoliosis!

The whole article contains many different kinds of data which to the reader appear a bit mixed up. So I would like to encourage the authors to restructure the ms. to make it more easy to understand (as well as the tables, which are hard to read). In the retrospective cohorts the data widely are missing and therefore could not be followed. Therefore I suggest to present the paper as a case series but not with too many claims for the outcome!

Without any doubt the senior author has high merits with respect to the approach of correcting coronal deformities with sagittal measures, however the claims made in the introduction,

"No brace technique described in present literature is based on pure sagittal forces applied only at the thoracolumbar spine, thereby extending the spine as a whole. There are no studies available on a bracing technique equal for both of the most prevalent adolescent spinal deformities as the adolescent scoliosis and the adolescent kyphosis or hyperkyphosis"

are basically not true. Maybe there is a need to discuss: Is it correction of the thoracolumbar area or the lumbar (as in my papers), but there are previous papers from 2004, 2005 and 2006 clearly showing that in my former center already we haven been able to correct coronal plane deformity with a simple sagittal correction (see also the figure as attached). Therefore these papers should have been discussed largely and not omitted. Also recent papers as published in scoliosis 2009 have shown the analgesic effect of lordosation of the lumbar spine. The recent Chêneau derivates since 2004 are respecting the lumbar (thoracolumbar?) sagittal correction besides the other 3D corrections (2 papers 2011) as well as the latest PT approaches as presented by Borysov and Borysov just recently (in the additional file of that paper one can find a more detailed description of sagittal exercises...).

So nothing is principally new or even better than state of the art. The only discussion may be the definition as to whether it is truly more a thoracolumbar or - as we do - a high lumbar lordosation as presented in the physio-logic (TM)
approach for physical therapy and in the braces we apply.

It would be interesting to know why this study is published that late (2012) when the latest results are from 2005?

If the article is started with: "Conservative treatment of adolescent spinal deformities with brace, especially scoliosis, is in modern times not proven to be effective in terms of lasting correction of curves. In scoliosis several studies can show positive results in preventing progression of curves.[1-4]" I would have expected more data in this paper showing that this brace is superior! On the other hand there are papers showing that it is possible to finally correct a part of scoliosis population with high correction braces of the up to date standard today. One very impressive case (showing the phenomenon exists) has been reported in my paper on the Chêneau light brace. So considering the lack of evidence shown in this study the expression should be more humble.

Finally I provide a list of papers contributing to this very topic which have to be discussed within this paper:

(A) pure sagittal correction of the lumbar (thoracolumbar) spine!!!


and (B) in the contact with 3D correction:


Only with a discussion of all this materials the paper can be considered complete, but I cannot find anything new which would merit publication. Therefore the authors have to argument more why it is important to publish this paper.

I would like to see another paper published in this field as biomechanically this aspect of sagittal correction clearly is of major importance (and still is not recognized by most of the clinicians), however the paper has to provide a realistic view on the facts and the scientific environment already available within the context provided!

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

The reviewer is advisor of Koob GmbH, Abtweiler, Germany