Reviewer's report

Title: The Sforzesco brace can replace cast in the correction of adolescent idiopathic scoliosis. A controlled prospective cohort study

Version: 2 Date: 25 October 2008

Reviewer: Manuel Rigo

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Minor essential revisions:

Please correct style mistakes. In abstract, methods section, after the first point the sentence starts with 'to the aim...'. Also, references [x] are most of time after '.' or ';' or ':' and should be before...etc

Discretionary revisions:

The authors define aesthetics and spinal sagittal profile as secondary results. I do not agree. We should consider these as primary results like the Cobb angle but I agree that the methods used in this study to assess aesthetics and spinal sagittal profile are so weak that these results can be considered as secondary in the present study. The strong point of the study which is the fact that the Cobb angle can be reduced with similar proportion by using a rigid plastic brace with no previous in-cast reduction than with a classic plaster cast becomes weaker from the big amount of non essential information.

The problem of the spinal sagittal profile in scoliosis is so complex that its reduction to the measurement of the C7 and L3 distance to a tangent on the thoracic highest kyphotic point is an unacceptable simplification in order to drawn conclusions about the results of an orthopaedic treatment. First at all, it must be discussed about the difference between structural and geometrical flat back. The assessment methods proposed in this study would be related more to the geometrical flat back. Scoliosis patients can be normo-kyphotic as well as hypo-kyphotic or even hyper-kyphotic (also strictly flat or even lordotic) from the geometrical point of view. Structurally they are always flat but this aspect is not measured by the here proposed methods. Thus, although a 'good result' should be always the improvement of the structural flat back (call it 'structural kyphositation'), from the geometrical point of view, a 'good result' sometimes is the reduction of the geometrical kyphosis, sometimes is to leave it like it is and sometimes is to increase it. Thus, talking about the sagittal configuration, the question here is whether or not a particular principle of correction would be able to correct the structural flat back or at least to decrease the Cobb angle with non associated deterioration of the structural flat back. Structural flat back has been associated to 'full contact' braces which use a pad to push the dorsal rib hump from dorsal to ventral. Classical casts used similar principle and it is not wrong to assume that the authors here used such a wrong principle looking at the
reduction of the rib hump observed in the patients treated with the cast. The reduction of the rib hump should be considered a positive sign just when the patients are able to bend forward in a same degree before and after the treatment. In this study the fact that patients treated with the cast showed a higher reduction of the rib hump associated with a reduction of the geometrical kyphosis could indicate that the structural flat back was also worsened and they just lost anterior flexion. Thus, it seems clear from this study than casts (or at least the cast technique used here by the authors) have a more detrimental effect on the sagittal profile compared with the plastic brace here proposed but it does not mean that the principles of correction used with the proposed plastic brace are the right principles to correct scoliosis in 3D. Both techniques used in this study could deteriorate function in long term when associated to the promotion of structural flat back, reduction in forward bending and reduction of breathing function (it would be very interesting to know about breathing function in patients treated with the plastic rigid brace showed in figure 3). Thus, my suggestion was to leave this part and to report only results related to the Cobb angle in order to make stronger the only strong point in the study: ‘a plastic rigid brace can reduce the Cobb angle in the same proportion than a cast’. To my opinion, no conclusions can be drawn from the rest of the results or just conclusions like ‘the principle of correction we used here to apply the cast produced more deterioration in the sagittal profile than the principle of correction we used to built the rigid plastic brace’ (which is related to the principle of correction rather than the material used to keep the correction, plaster or plastic).

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interests