Reviewer's report

Title: Rigid braces can replace casts in the first correction of adolescent idiopathic scoliosis. A controlled prospective cohort study on the Sforzesco brace versus Risser cast

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Reviewer: Manuel Rigo

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General comments and major compulsory revisions

First, although Risser cast and other casting techniques have been abandoned by many specialists and last papers on it are dated on the nineties, it is still used and recommended by some well recognized colleagues in countries like France, Italy, Spain or Israel (and probably others) to be used in the corrective phase of the treatment in severe and rigid scoliosis when surgery is rejected. The argument is that plastic-removable braces are not able to correct in such an efficacy and, on the other hand, compliance is less just by the fact that they are removable. It is possible to achieve a good in brace correction with plastic-rigid braces and the procedure seems to be not so ‘wild’, but in severe curves, a comparison between these two different procedures has not been published in a scientific study. Thus, the present paper can be considered of interest at least for the specialists from several countries and mainly for those specialists in conservative treatment.

Second, the design is not the best to draw the conclusion that a plastic-rigid brace can replace a Risser cast in the correction of a severe scoliosis. It would be better a prospective randomised study after defining ‘restrictive’ inclusion criteria, including correctibility assessed in lateral bending X-rays. The shortest term result would be in brace correction as a preliminary report. Medium term results, analysing the impact of forced compliance versus free compliance should be reported in a second paper where no compliance with the plastic brace as well as the necessity to remove the plaster cast for any reason should not be considered as exclusion criteria.

Thus this study use not the best design but reports medium term results comparing both techniques, one of them, the reference technique, in a retrospective way as it was abandoned by the authors some time ago. It seems that the authors got the experience that the Risser cast was a too complicate and probably very stressing procedure compared with the braces they were later using so they abandoned it. In any case, to come back and use again the cast versus the plastic brace in a comparative prospective study should not represent an ethic problem unless they recognize the first one is definitively over. In any case, even the design is not the best, I do not consider that this paper should be rejected for it.
Looking at table one, it seems obvious that both groups had similar initial Cobb angle and similar curve pattern distribution, but this is not stated in the results section and it is not discussed. It would be interesting to really check, even the design was not for ‘two matched samples’, if both compared groups were or not different in the initial Cobb angle and curve pattern distribution. It would be also interesting to discuss about the possibility of both groups being different in correctibility. As candidates for surgery they could or should have all radiological bending test so this could be assessed by the authors easily. If the authors had not this parameter they should explain and justify why not in the discussion section. Thus, discussion section could be more clear when the authors explain about these weak points: study design, comparable groups and correctibility. Strongest point is probably the fact that they did not exclude any patient from the tested group.

It is the opinion of this reviewer that clinical results using the aesthetic index and sagittal profile assessed by ‘arrows’ is so weak presented as additional results to the changes in the Cobb angle, and on the other hand, are making the whole paper so long as well as quite disorganized that this part could be easily eliminated from this paper. As a first step, preliminary results to check whether the Risser cast can be or not replaced by a rigid –plastic brace, the results about the Cobb angle would be enough and would make the study more clear, easy and consistent. As the authors state at the end, this is not a study to show the efficiency of bracing in severe scoliosis. Thus, any clinical outcome should be considered only with the right study design, an appropriated sample under clear risk for progression, etc

**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