Reviewer’s report

Title: Computer Aided Vertebral Visualization and Analysis: A Pilot Study Using the Sand Rat, a Small Animal Model of Disk Degeneration

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Reviewer: Dr Alison McGregor

Level of interest: A paper whose findings are important to those with closely related research interests

Advice on publication: Accept after discretionary revisions

Abstract: The ordering of the abstract is unconventional and I am not sure why the results preceed the methods.

Background: 1st paragraph, the need for this study has not been stated clearly, and its context in the field not clear.

A key component of developing a new technique to measure something would be to establish that 1) its valid and 2) that its repeatable and 3) accurate. My frustration is that only the stages of the methodology are presented and that these stages or the overall stages are not assessed in this way or compared with existing methodology.

Methods: 1st paragraph surely much of the bulleted steps should be incorporated into figure 1, or figure 1 be removed. Also not sure about style here.

More details of the actual imaging protocol and magnification issues would be useful.

For the non image processing expert more clarification on what is meant by some of the terms used and clearer example for instance of how a Canny edge detection procedure refines the image. Also you state angles of curvature measures but I am not sure which curves you are refering to and what specific angles you are measuring - unless I have missed something.

This is a complex image processing procedure and not all the stages are clearly defined or put in context with each other, whilst clear to an expert in the field, other who may be interested in the applications of such techniques will get lost.

Results and discussion: These I feel would be enchanced by inclusion of at least a measure of how repeatable the data obtained from this process is and how its compares to conventional or even clinical methods.

Also it is not made clear how this work will develop research in this area.

Figures not always clear but suspect this is a digitisation issue.

Competing interests:

None declared.