Review of: "Dose Reduction in Medical Radiography: Advancing Veterinary Diagnostic Solutions"

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Potential competing interests: No potential competing interests to declare.

REVIEW COMMENTS

Title: Dose Reduction in Medical Radiography: Advancing Veterinary Diagnostic Solutions.

The authors tried to compare the radiation dose from a commercial flat panel detector (FPD) and the linear array detector with an attached fan beam collimator. The innovative aspect of the study is the added fan beam collimator that was developed to serve as a dose reduction mechanism in the linear array detector. The authors used both phantom and animal studies for their comparisons. I have reviewed the work extensively and provided the following comments.

Abstract

1. The development of the fan beam collimator is the most innovative part of this study, rather than the mechanical system, so the abstract should capture that portion instead of the mechanical system development. Again, the development of the fan beam collimator was what was described in the materials and methods, not the mechanical systems. So, line 2, which read, ‘We developed a mechanical system that facilitates x-ray scans using LAD,’ should be reframed to include the development of the fan beam collimator with the LAD.

2. LINE 3: ‘For comparison, we selected a standard FDP unit.’ Please delete this statement.

INTRODUCTION

3. Line 1: ‘But it comes with risk of ionizing radiation exposure.’ Please insert ‘potential’ before ‘risk of ---.’

4. Line 7: ‘In routine diagnostic imaging examinations such as mammography, the dose becomes even more important.’ Why the dose becomes more important in mammography, please state some reasons why the dose becomes more important with mammography.

5. Line 8: ‘For diagnosing conditions in equine and cattle.’ Consider changing to ‘For diagnosing conditions in equine and cattle.’

6. DNA, H, OH, including any abbreviation, should be written in full on the first mention to obey the rules of abbreviation.

7. Line 16: ‘Digital detectors have replaced conventional films in medical imaging.’ This is true, but please consider providing some reasons why digital detectors have overtaken conventional films in medical imaging.

8. Line 21: Please remove the semicolon and join the two statements.

9. Line 23: Please consider joining the two sentences.

10. Lines 30 and 31: The use of a grid is mandatory ……. Please check this statement again because in digital medical imaging, the use of a grid is not mandatory. In digital medical imaging, the optical density is not proportional to the exposure dose as in the case of conventional film. Even your reference provided doesn't support that argument. Read reference 27 again and correct this portion.

11. Page 3, line 2: …form the image Fig 1B' … Consider changing it to 'form the image as shown in Fig 1B.

12. Line 4: --'used in in direct radiography'. Please, change it to 'used in in indirect radiography'

Materials and methods

13. Line 1: LAD systems Fig 1C were designed. Please, put Fig 1C in a bracket like (Fig 1C). Please do the same for Fig 2A in line 7 as well.

14. Line 8: 'specifications were covering' .. Please, change to specifications covered the range…

15. What are the characteristics of the reference FDP X-ray unit? That is, the voltage range, mAs range, etc.

16. Line 31, please remove the 'Best Medical brand,

17. Line 33: write the exams in full as examinations.

18. Page 6, line 1: the statement is not clear. Please, clarify that.

19. Line 4: the statement is not clear. Please, clarify it.

20. The selection of mAs described by the authors is clear, especially in the example cited. The mAs is Tube current (mA) x Time of exposure in seconds. So dividing 1000 mAs by 200 ms and still getting mAs needs to be clarified.

21. Veterinary imaging was performed using the developed LAD, but no ethical procedures or clearance was provided for using an animal for the research.

22. Who are the manufacturers of the anthropomorphic phantom, and what are its characteristics?

Results and Discussions

23. Page 7, lines 3 and 4, were presented in Table 1 A and 1 B. Please change it to 'were presented in Tables 1 A and 1 B.

24. Line 4, while graphical comparison was plotted in FIG 4 A, based on these values. Please delete based on these values.

25. Line 5: it was observed that there is a dramatic dose difference between LAD and FDP in the lumbar AP and lumbar lateral examinations. Please, use a statistical test to describe the difference. Test the significance difference, and present the difference in terms of percentages.

26. Results in Tables 1 A and 1 B: if the measurements of dose were made on the anthropomorphic phantom, then the Table headings should clearly indicate that.

27. Obviously, anthropomorphic phantom dose analysis couldn't have given precise results. What do the authors mean by this statement?

28. A diagnostic quality phenomenon are subjective criteria itself. What do the authors mean?

Diagnostic quality image assessment can be performed using a subjective or objective approach. In clinical practice, imaging assessment for diagnosis is done using subjective analysis.

29. Image quality analysis should have been performed because a reduction in dose should not affect imaging quality. So preferably, any medical imaging technique intending to reduce dose should assess the image quality as well.

Conclusion.

Page 10. Line 2. Difficulties should be replaced with difficult.

The last paragraph is more of a recommendation than a conclusion.