Reviewer's report

Title: Ultrasonic scalpel causes greater depth of soft tissue necrosis compared to monopolar electrocautery in a pig model

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Reviewer: Daniel Rittirsch

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In their manuscript entitled “Ultrasonic scalpel causes greater depth of soft tissue necrosis compared to monopolar electrocautery in a pig model”, the authors evaluated the histopathology of tissue necrosis induced by ultrasonic scalpel (UC) in comparison with monopolar electrocautery (ME). For this study, tissue samples from the abdominal wall of pigs (n=16) were excised. The excision was either done manually or automatically using a self-constructed device. The authors found that both systems, UC and ME, induce coagulation necrosis. As the main finding, necrosis using UC was deeper than by ME, while the depth of necrosis was independent of the mode of excision.

Major Compulsory Revisions

1. In order to minimize systematic bias, the authors developed a useful device for the excision of samples. Interestingly, the mode of excision (manual vs. automatic) does not seem to play a major role although it has been shown in a previous study that tissue damage depends on activation time and pressure. In the same study (Enam and Cuschieri, Annals of Surgery 2002, Vol. 237, 2, 186-191), which is also referenced in the manuscript, it has been demonstrated that the heat produced during activation of UC is proportional to the power setting. Therefore, it is surprising that the authors only used a single power level for each device (60W for ME or level 5, respectively, which is the highest level for UC). Thus, the conclusion that UC induces deeper necrosis as compared to ME is not supported by the data presented. Ideally, both systems, ME and UC, should be compared for histopathology by employing ‘dose-responses’ of power levels which cover the whole range of application of each system.

Minor Essential Revisions

1. Introduction: the background (controversy about the advantages of UC over high-frequency electrosurgery with respect to safety, costs, operating time, etc.) should be pointed out in more detail. It is not entirely clear as to why this study was eventually performed and the Introduction basically lacks a hypothesis.

2. Number of samples: The authors describe that from each pig (n=16) 8 excisions were taken, which would add up to 128 samples in total. However, according to the Results section 100 samples were analyzed. What happened to the rest of the samples?

3. The Results section is very ‘concise’ and might be expanded in a future
version of the manuscript.

4. Figures/tables: the resolution of the images is very low which makes it difficult to identify some details.

5. Table 2 contains redundant information and should be omitted since the same data are displayed in Fig. 5.

**Level of interest:** An article whose findings are important to those with closely related research interests

**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:**

I declare that I have no competing interests.