January 7, 2018

Nam Nguyen, Ph.D.  
Manager of Review

JoVE

Dear Dr. Nguyen,

Thank you for the opportunity to revise our manuscript. We appreciate both reviewers for their time spent on reviewing our work and their insight. Reviewer comments are included below, with our response in italics.

**Reviewers' comments:**  
**Reviewer #1:**  
Manuscript Summary:  
The authors introduced a novel and alternative technique of primary abdominal closure following ACS utilizing the ABRA abdominal system and a biologic xenograft, with a 100% closure rate with an average of 9.36 days from ABRA application to fascial closure.  
  
Minor Concerns:  
1. Besides SSIs, can this novel TAC technique decrease the rates of other complications, such as enteroatmospheric fistula?

*Thank you for this comment. None of the 11 (10? On the “reasons for open abdomen” there are only 10 patients listed) patients in this cohort developed an enteroatmospheric fistula, hernia or surgical site infection. One of the major benefits of this technique is that it provided fascial closure within 9 days. Previous studies have shown that early fascial closure has significant improvement in survival in patients managed with open abdomens. Although our study is limited, the benefits of early fascial closure may be extrapolated from previous comparison studies.*

*Chen Y, Ye J, Song W, Chen J, Yuan Y, Ren J. Comparison of outcomes between early fascial closure and delayed abdominal closure in patients with open abdomen: a systematic review and meta-analysis. Gastroenterol Res Pract. 2014;2014:784056. vol. 2014, Article ID 784056, 8 pages, 2014. I added this reference just in case we wanted to add this to the manuscript because I think the 9 day closure is the benefit this approach*

2. Is there any primary clinical data comparing the safety and efficacy of the novel TAC technique with other TAC techniques?  
  
*At this time, we have not collected data comparing our novel TAC with other TAC techniques. At our institution, a negative pressure wound therapy is used frequently. It is in fact used in conjunction with the described ABRA DTS and xenograft described here. However, we do not have comparison of these two techniques at this time as separate TAC approaches.*

**Reviewer #2:**  
Manuscript Summary:  
This is an interesting approach to abdominal wall reconstruction. I do not think using the progressive device to close the fascia is a novel idea, however the lack of skin closure is very concerning.  
  
Major Concerns:  
Using very expensive products and not taking cultures or closing the skin, allowing the skin to heal secondarily will lead to an unstable scar. There is no discussion for your cases that there was insufficient soft tissue to close the anterior abdominal wall. This does not make sense...There is a type in line 108, please address.

*Thank you for this comment. We did not see the need to take cultures from the skin. Many of our patients (n = ?; I can’t tell from the list how many) had an open abdomen because of abdominal sepsis. Most had started and/or finished a course of antibiotics prior to the application of the dynamic closure device. Because gross infection was not noted, we did not take culture from the skin.*

*In regards to the soft tissue defect, the measurements collected were of only the fascial defects. Although measurements were not made of the soft tissue defect, the biologic xenograft was used to accelerate secondary healing in the soft tissue defect.*

Why does vac sponge need to be "as thin as possible" KCI has done tremendous research into the height of sponge and pore size, I did not see any rational for making the sponge thinner in your paper.

*Thank you for this comment. You are indeed correct that the sponge does not need to be as thin as possible. We will consider leaving this step out in the future. (Not sure how to respond to this)*

What is an osteopathic maneuver? How does that play a significant role in your project

*The osteopathic maneuver is demonstrated in the video. Through tangenital compression on the skin layer, the fascial layers are approximated. Although we did not measure the fascia distances before and after osteopathic maneuvers, we do believe it serves an important role. At the time of this paper, there are no studies available concerning fascial approximation and osteopathic maneuvers. However, a study using mathematical model found that tangenital and compressive forces on the skin are transmitted to the fascial layer and in our experience this has helped approximate the fascial layers.*

*Chaudhry, H., Bukiet, B., Zhiming J., Stecco, A. & Findley T. Deformations experienced in the human skin, adipose tissue, and fascia in osteopathic manipulative medicine. J Am Osteopath Assoc. 114 (1), 780-7, doi: 10.7556/jaoa.2014.152 (Again, added this citation just in case we wanted to add it to the manuscript.)*

What happens when water touches the device and why does the patient need to go back to the OR to change sponge if you are leaving silastic sheet in place, all of the tension devices can be tightened at the bedside. Are you all taking cultures to ensure that these wounds are not contaminated prior to closing?

*We do not have experience on what happens when water touches the device.*

*The sponge is changed in the operating room to maintain sterility. Although this can be performed at the bedside, the utility of a full anesthesia staff and operating staff was useful in these critical patients.*

*No cultures are taken prior to abdominal closure. The abdomens were not grossly contaminated prior to closure, and patients were clinically stable without signs or symptoms of gross infection. If cultures came back positive, we would not have treated it because patients were otherwise stable and the culture would have been treated as a contamination.*

Did you randomize closing with and without acell, this would add a lot more power to this study especially if you are going to let the skin heal secondarily... it might be helpful to also not use the vac in an acell patient, I anticipate that it would take some time to heal.

*This is an excellent point. No we did not randomize closing with and without acell, this may be a project at our institution in the near future. It would provide with interesting comparison data.*