

## Endovascular Resuscitation Techniques for Severe Hemorrhagic Shock and Traumatic Arrest in the Presurgical Setting

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We read with great interest the article by True, Siler, and Manning in the last issue of the *Journal of Special Operations Medicine*.<sup>1</sup> The authors provided an overview of the concept of using a balloon to occlude the aorta as a resuscitation mean for the treatment of trauma patients—the rationale, current developments, and the way forward.

The Israeli Defense Force Medical Corps has set a goal to eliminate preventable deaths by the year 2020 as part of our force buildup plan called “My Brother’s Keeper.”<sup>2</sup> The plan puts great emphasis on point-of injury and prehospital care, including remote damage control resuscitation (RDCR). Constantly looking to expand our limits and our toolbox, we appreciate the value of aortic balloon occlusion techniques and support their development for use in the prehospital, even austere environment, by both following the work of our colleagues around the world and local Israeli initiatives.

While being supportive with the idea and appreciative of the value of this paper, we would like to point out a few limitations not mentioned in the article.

The effect of aortic occlusion on blood pressure (BP) is discussed all along and mentioned in the majority of the sources quoted. Without data on mortality, we have to be cautious in tying elevated BP to improved survival, especially as the elevation only concerns the heart and brain—the rest of the body is ischemic. This, of course, calls for further studies and even a small series of cases, but as it is generally accepted that any BP is better than no BP, this should not delay our work.

The authors offer a detailed description of the challenges and steps ahead of us in developing such field-ready and relevant devices. Challenges with the insertion and operation of the balloons, as well as the use of the advanced resuscitation technologies mentioned, await us, too.

Not mentioned in the article is the biggest challenge when using these devices, once complete and deployed. This will not be how to *perform* the procedure, but rather how to *identify* the right casualty who will be the one to benefit from it.

Even when (not if) we solve the “how can we do it in the field” issue, overuse of the technique by medics is a major concern. The result might be endangering the team and the mission, by spending time on heroic but futile attempts to revive or evacuate a casualty who is already dead. Spending time on a procedure that is potentially beneficial, but not absolutely necessary at the moment (instead of performing a more important procedure for the survival of the casualty or evacuation), is another one of these concerns. Such concerns will have to be addressed when deploying and training.

Last, we cannot see providers replacing the type of the balloon as the casualty moves between the echelons. This should be avoided with the development of the next generations of balloons and the ongoing research.

The aforementioned is not to discourage us from perusing this path to eliminate deaths from hemorrhage. The advantages for using a balloon to occlude the aorta, as mentioned by the authors, are substantial and we all should continue the efforts to field the technology and save lives.

### References

1. True NA, Siler S, Manning JE. Endovascular resuscitation techniques for severe hemorrhagic shock and traumatic arrest in the presurgical setting. *J Spec Oper Med*. 2013;13:33–37.
2. Israeli Defense Force Medical Corp. My Brother’s Keeper. <http://www.israeldefense.co.il/?CategoryID=485&ArticleID=3942>.