

# Would Changing the Term “REBOA” to Intra-luminal Aortic Control Potentially Increase the Adoption of the Procedure?

Kessel–Khan Corner

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Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) is a minimally invasive technique that can be used for resuscitative measures and to control arterial bleeding in patients with life-threatening haemorrhage. This can help to buy crucial time to achieve initial haemostasis and allows other interventions or investigations to be performed. REBOA is a relatively new technique and it is not yet widely implemented by surgeons. There are several reasons for this, including concerns about safety and efficacy. In our previous Corner, we have discussed the potential limitations of REBOA use [1]. The world of haemorrhage control surgeons is currently divided into two main groups: those that advocate the use of REBOA and those that are against it. One of the major factors is the apparent industry-led drive to increase the utilization of this device. However, if one were to purely look at the mechanism by which REBOA achieves haemostasis, then it would be appreciable that it achieves the exact same outcome as its open surgical counterpart: intraluminal versus extraluminal occlusion.

One potential way to increase the adoption of REBOA is to change the way that it is described. Clamping of the descending or the supraceliac aorta is a hugely invasive procedure that carries extensive morbidity and mortality, and that can lead to complications such as stroke and kidney failure. REBOA, on the other hand, is a much less invasive procedure. It has its own risks, but benefits from not requiring opening of the thoracic cavity to clamp the aorta, thus decreasing the potential burden of injury by not augmenting it with a thoracotomy.

In our opinion, a more accurate way to describe REBOA is as “intra-luminal control”. Extra-luminal control refers to the placement of a clamp outside of the aorta. Intra-luminal control describes the placement of a balloon inside of the aorta. Both techniques can be used to increase cardiac and cerebral perfusion, as well as arrest subdiaphragmatic haemorrhage. However, the nature of their application does have differing advantages and disadvantages.

Extra luminal control has the potential to be less effective compared with intraluminal occlusion. The effectiveness and proper performing of descending or supraceliac aorta clamping is not well evaluated and is under-reported [2–6]. Intra-luminal control is suggested to be more effective than extra-luminal control and is less invasive, but can carry regional and distal complications, i.e., vessel rupture, distal ischemia, etc. The patient selection for both techniques depends on the specific situation.

REBOA is a minimally invasive technique that can be used in various clinical scenarios of major bleeding. It is not yet widely adopted by surgeons, but it is hypothesized that changing the way it is described may increase its adoption. There is evidence that changing the wording used to describe new processes can change the viewpoint of users and positively effect adoption, in particular, focusing on “attitude” factors [7]. Hence, by undertaking these changes we may possibly increase REBOA adoption by surgeons. We propose that trauma leaders may be more likely to consider using REBOA if it was described as “intra-luminal control” and clamping as “extra-luminal control”.

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### Ethics Statement

- (1) All the authors mentioned in the manuscript have agreed to authorship, read and approved the manuscript, and given consent for submission and subsequent publication of the manuscript.
- (2) The authors declare that they have read and abided by the JEVTM statement of ethical standards including rules of informed consent and ethical committee approval as stated in the article.

### Conflicts of Interest

The authors declare that they have no conflicts of interest.

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### REFERENCES

- [1] Khan M, Kessel B. Why don't trauma surgeons use resuscitative endovascular balloon occlusion of the aorta: evidence, holy grail or fear? *J Endovasc Resusc Trauma Manag.* 2023;6(3):119–20.
- [2] Berland TL, Veith FJ, Cayne NS, Mehta M, Mayer D, Lachat M. Technique of supraceliac balloon control of the aorta during endovascular repair of ruptured abdominal aortic aneurysms. *J Vasc Surg.* 2013;57(1):272–5.
- [3] Takano Y, Fujioka S, Shozaki H, Toya N, Ikegami T. Supraceliac aortic cross-clamping to control bleeding from the celiac axis during pancreatic surgery: a case report. *Surg Case Rep.* 2021;7(1):256.
- [4] Peru N, Malgras B, Pocard M. Left anterolateral thoracotomy with cross-clamping of the descending thoracic aorta and open cardiac massage to control massive intra-abdominal bleeding. *J Visc Surg.* 2018;155(5):407–11.
- [5] Buxton B, Reul G, Jr., Cooley DA. Transdiaphragmatic approach to the descending thoracic aorta for proximal control during surgery on the abdominal aorta. *Am J Surg.* 1978;135(5):726–7.
- [6] Buxton B, Reul GJ, Jr., Cooley DA. Transdiaphragmatic approach to the descending thoracic aorta for proximal control during surgery on the abdominal aorta. *Cardio-vasc Dis.* 1977;4(3):290–3.
- [7] Roberts R, Flin R, Millar D, Corradi L. Psychological factors influencing technology adoption: a case study from the oil and gas industry. *Technovation.* 2021;102:102219.