

Background

- Partial REBOA (p-REBOA) is an emerging technique to maintain favourable hemodynamics with less distal ischemia than continuous REBOA.
- However, the reliance on measuring mean arterial pressure (MAP) distally may be less accurate than measuring flow.
- A non-invasive, wireless, wearable doppler ultrasound (FloPatch – see below) that is capable of measuring multiple flow parameters, could be useful to help guide p-REBOA.



Objective

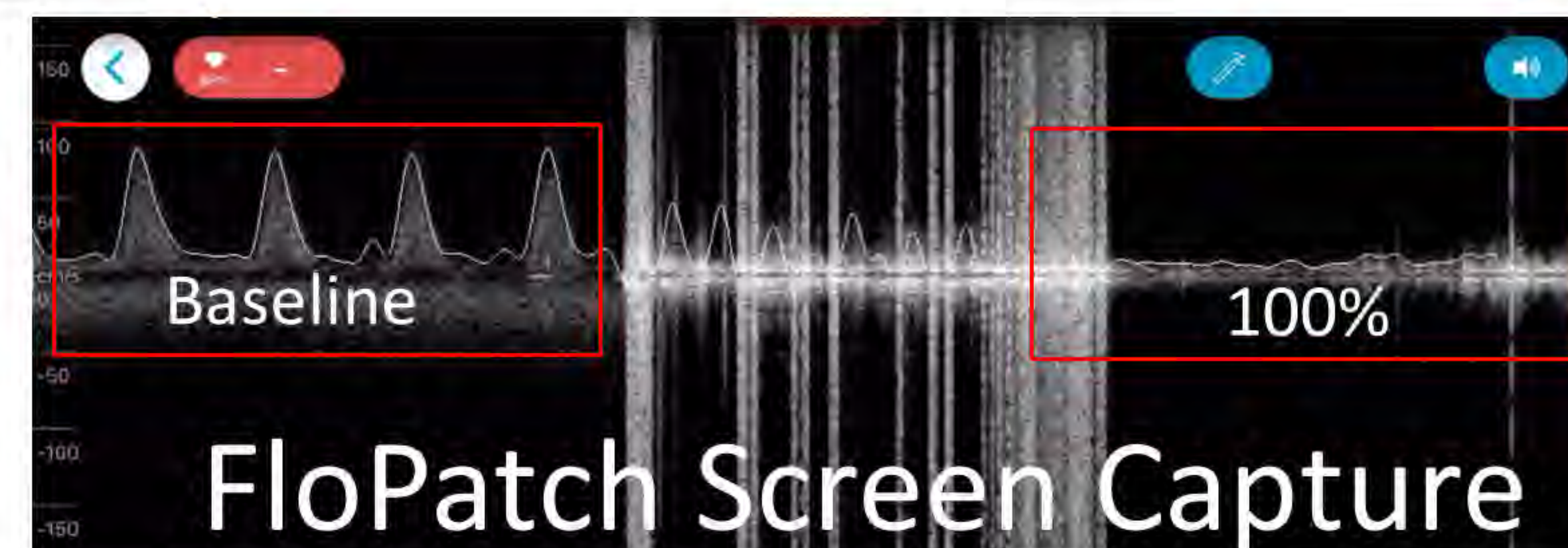
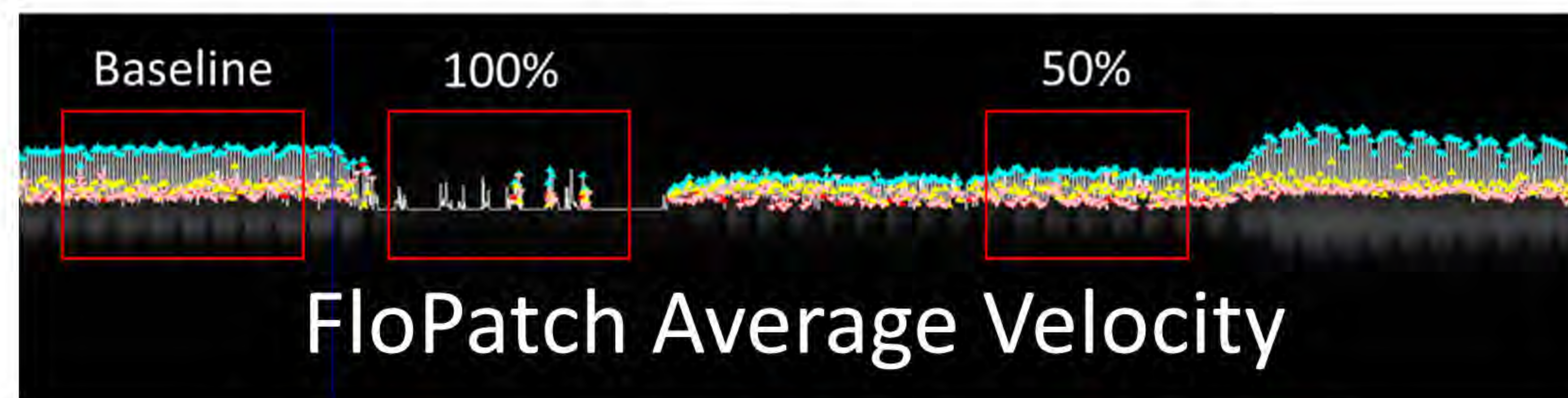
- To investigate the feasibility of using FloPatch on the femoral artery and COBRA-OS™ for p-REBOA in a swine model.

Methods

- Using an anesthetized non-hemorrhagic 75 kg female swine, the COBRA-OS™ was used to occlude the aorta 100% in Zone 1 for 5 minutes and then 50% p-REBOA for 5 minutes using an aortic flow probe to guide titration.
- Distal to the balloon, the following were measured and analyzed: MAPs using an oversized ipsilateral sheath; peak systolic velocities (PSV), velocity time integral (VTI), and 1-second average velocities using FloPatch that was placed on the contralateral groin femoral artery.

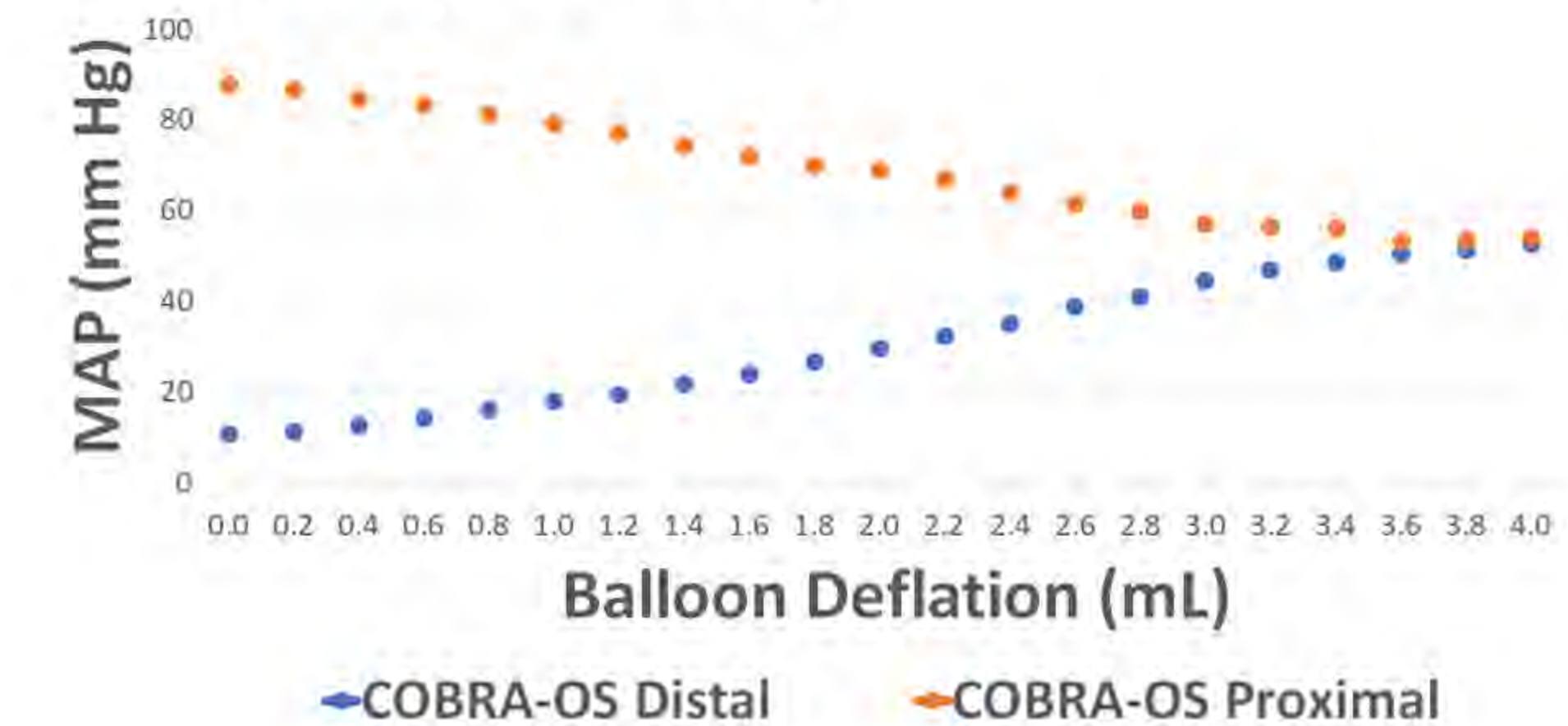
Results

- The aortic flow probe measured (mean values) 5.94 L/min at baseline, 0.24 L/min at full occlusion (-96.0% from baseline), and 2.93 L/min at 50% occlusion (-50.7 from baseline).
- At 100% occlusion, all FloPatch measurements were -100% from baseline with no pulsatile waveform compared to MAPs that were -74% from baseline with visible monophasic waveforms.
- At 50% occlusion, FloPatch average velocity was the most accurate (see below) at -51% from baseline, followed by PSV (-40%), VTI (-30%) and MAPs (-30%).



Discussion

- The FloPatch represents a potentially useful non-invasive adjunct to help guide full aortic occlusion and p-REBOA, when compared to distal MAPs, to achieve targeted distal flow rates.
- The COBRA-OS™ is able to titrate flow over an average of 4.0 mL in a linear fashion, which is adequate for p-REBOA (see below).



Conclusion

- The combination of using FloPatch on the femoral artery and COBRA-OS represents a potentially useful system for p-REBOA.
- This is the first report of using FloPatch on the femoral artery for this purpose.

Acknowledgments

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