

## BACKGROUND

Cardiac surgeons at our hospital asked the pharmacy for a new device to reduce bleeding during aortic suture. HEMO-SEAL<sup>®</sup> (ETHICON) suture offers a decrease in the ratio of needle-to-suture diameters that would reduce needle-hole bleeding. This device is more expensive than an equivalent classic suture. According to the only study available from ETHICON, a 67% reduction in bleeding was observed with this technology.

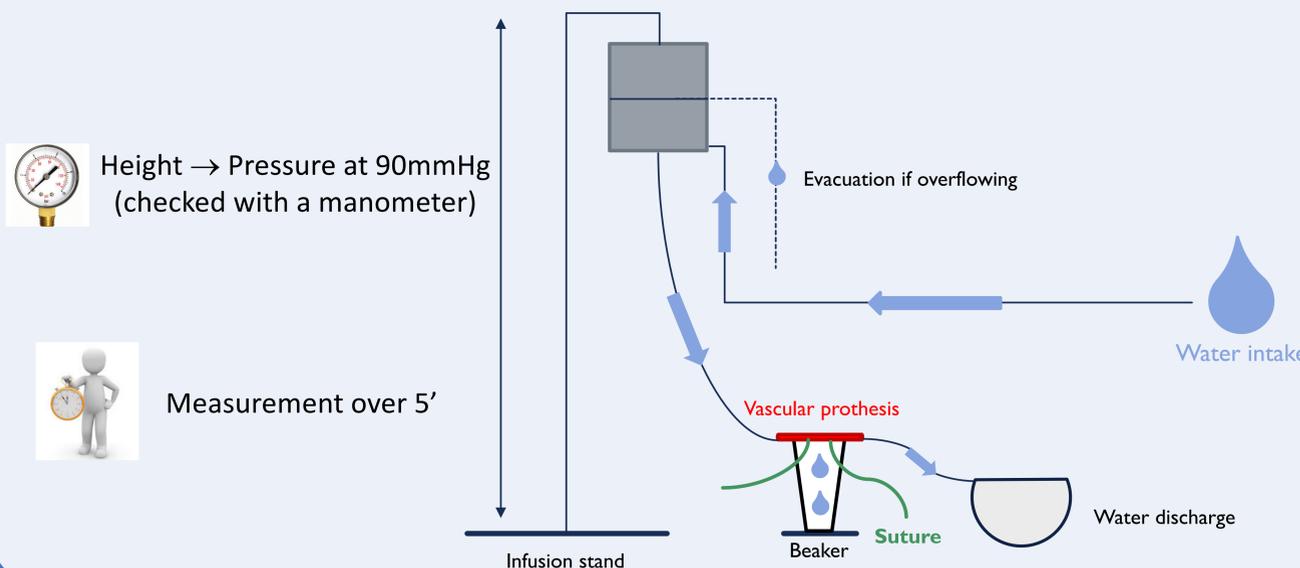
**Objective :** Compare in vitro a classic suture and a HEMO-SEAL<sup>®</sup> (HS) suture

## MATERIAL AND METHODS

→ Two equivalent sutures: a classic and a HS suture with identical needle characteristics

1. First, we compared the two sutures with a binocular loupe.
2. Then, we developed an experimental model to compare the bleeding with the two sutures:
  - creation of a circuit with water into a vascular prosthesis
  - we collected water that flowed from the holes made by the suture
  - we measured the difference of the weight of water collected with the two sutures

Same diameter (USP 5/0)  
Tip geometry, curvature, length



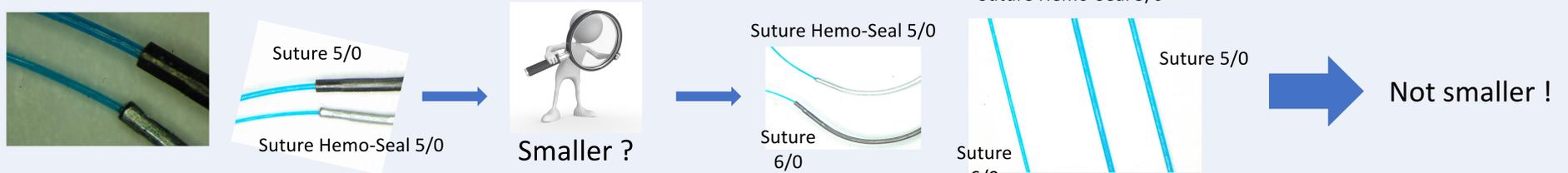
Importance of the choice of prosthesis  
⇒ waterproof !



- n = 6 per suture
- Comparison of the weight of water collected (weight of the empty beaker = 246,121 g)
- Results are expressed in terms of mean ± standard deviation.

## RESULTS

### 1. Binocular loupe :



The two sutures both strictly look the same with the binocular loupe, except the region at the needle attachment of the HS suture which had a smaller diameter.

### 2. Experimental model :

Classic suture	HS suture
<u>Weight of water collected in the beaker (g)</u>	
n <sub>1</sub> : 29,989	n <sub>1</sub> : 9,144
n <sub>2</sub> : 26,069	n <sub>2</sub> : 9,679
n <sub>3</sub> : 31,205	n <sub>3</sub> : 7,951
n <sub>4</sub> : 34,193	n <sub>4</sub> : 6,605
n <sub>5</sub> : 28,297	n <sub>5</sub> : 6,659
n <sub>6</sub> : 19,049	n <sub>6</sub> : 7,191
Mean = <b>28,134 g</b>	Mean = <b>7,872 g</b>

28 g (± 5)  
VS  
8 g (± 1)

3,6x more water collected with the classic suture

**71% reduction with the HS suture**  
(p < 0.05)



## CONCLUSION

HS suture really seems to reduce needle hole bleeding. But despite this important difference, we identified biases such as: we did not use blood but water at a constant pressure (90mmHg), we did not make a real knot, our small number of samples, our experience (different of a surgeon) and our collection method with the time arbitrarily set at 5 minutes. In order to get as close as possible to the in-vivo conditions, it would be interesting to repeat tests with anastomoses performed by a surgeon.

Furthermore, clinical impact of this reduction of bleeding remains to be assessed.

