Hemodynamic Consequences After Venous Stenting: An In Vitro Assessment

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Disclosures

I have the following potential conflicts of interest to report:

- Receipt of grants/research support
  Medtronic, BD, Cook, Bentley, Optimed, Boston Scientific, Philips, Abbott, VeinWay
- Receipt of honoraria and travel support
  Medtronic, BD, Cook, Bentley, Optimed, Boston Scientific, Philips, Abbott, VeinWay

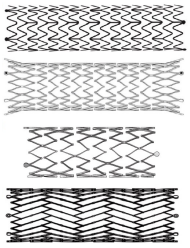
Introduction

- Jailing of the contralateral limb
- Jailing of DFV and other tributaries

Introduction

List	Venous Stents	Company	Size [mm]	Design
1	Sinus Venous	Optimed	12, 14 & 16	Open cell
2	Sinus Obliquus	Optimed	12, 14 & 16	Hybrid
3	Wallstent	Boston Scientific	12, 14 & 16	Closed cell
4	Abre	Medtronic	12, 14 & 16	Open cell
5	Zilver Vena	Cook	12, 14 & 16	Open cell
6	Blueflow	Plusmedica	12, 14 & 16	Closed cell
7	BeYond	Bentley	12, 14 & 16	Open cell
8	Venovo	BD	12, 14 & 16	Open cell
9	Vici	Boston Scientific	12, 14 & 16	Closed cell

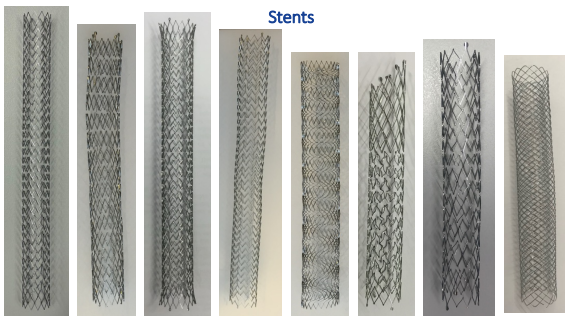
Used venosus stents for this research



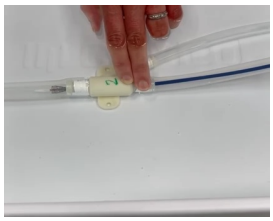
Different stent porosity

4

Stents



In-vitro model

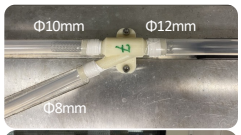


Implantation of stent

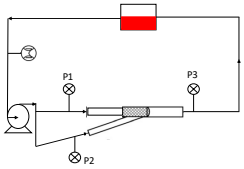
Experimental model

In-vitro model

In-vitro model

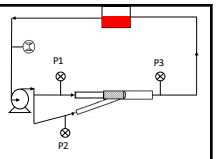


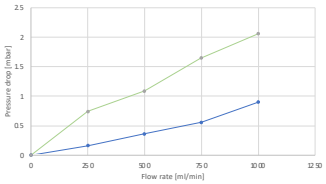
Test conditions:
1- Flow rate: 0-4000 (ml/min)
2- Room temperature
3- Animal blood
4- Rotary pump
5- Pressure drop (P1-P3 & P2-P3)
6- Tube material: silicon
7- Tube size: 8-10-12 mm
8- Tube thickness: 1.5 mm



Schematic of in vitro model

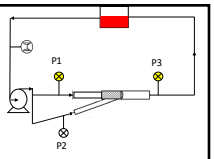
Preliminary results

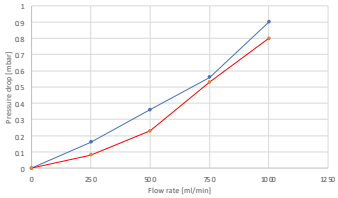




Line	Sample	Type	Size [mm]	Pressure
	S4213	4	12x100	P1-P3
	S4223	4	12x100	P2-P3

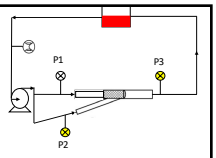
Preliminary results

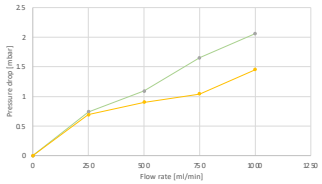




Line	Sample	Type	Size [mm]	Pressure
	S4213	4	12x100	P1-P3
	S4213	4	14x100	P1-P3

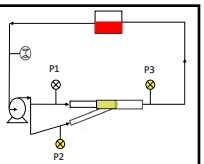
Preliminary results

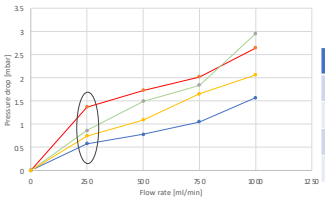




Line	Sample	Type	Size [mm]	Pressure
	S4223	4	12x100	P2-P3
	S4423	4	14x100	P2-P3

Preliminary results





Line	Type	Design	Production	Size [mm]	Pressure
	1	Open cell	Laser cut	12 x 100	P2-P3
	2	Closed cell	Braided	12 x 90	P2-P3
	3	Closed cell	Braided	12 x 100	P2-P3
	4	Closed cell	Laser cut	12 x 90	P2-P3

Conclusion

- The results demonstrate that this hemodynamic model is a suitable tool to evaluate the effect of stent design on venous flow
- With further tests, we might be able to answer the question whether and how a dedicated venous stent jailing deep femoral vein or contralateral iliac tract will affect the flow (does porosity matter?)

Thank you

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