

Analysis of venous intimal reaction after stent implantation: Does stent porosity matter?

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Disclosure

I have the following potential conflicts of interest to report:

- Receipt of grants/research support

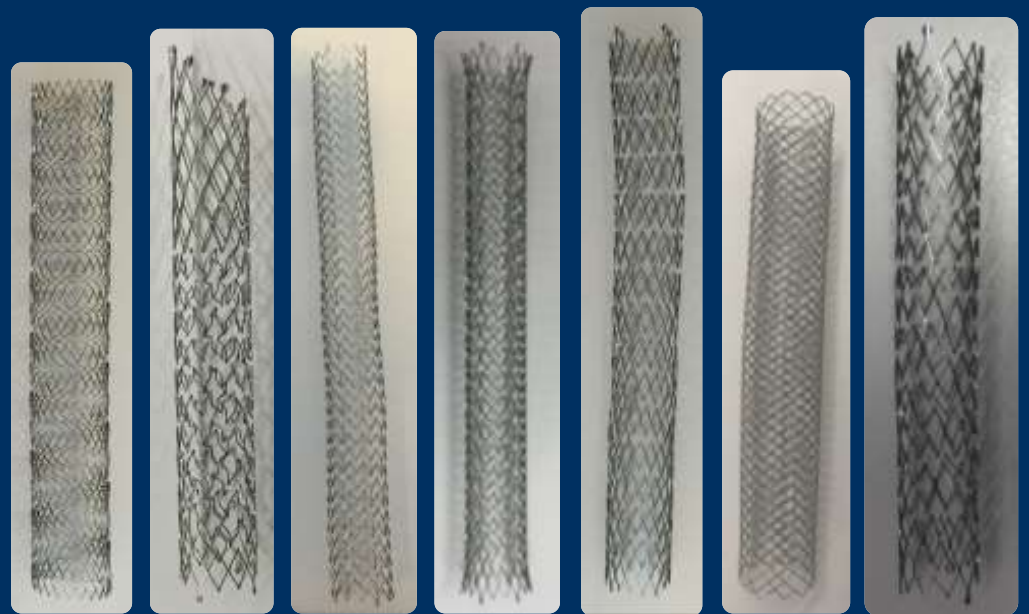
Medtronic, BD BARD, Cook, Ab medica, Bentley, Optimed, Boston Scientific

- Receipt of honoraria and travel support

Medtronic, BD BARD, Cook, Ab medica, Bentley, Optimed, Boston Scientific

Objectives

- Effect of porosity on venous wall
 - Initial injury
 - Inflammation
 - Connective tissue proliferation
- Effect of porosity on neo-endothelialization of the stent
 - Time to complete endothelialization
 - Quality of endothelium
- Patency of jailed tributaries



Project Overview

- Sponsorship:



- Timeline:



- Study samples

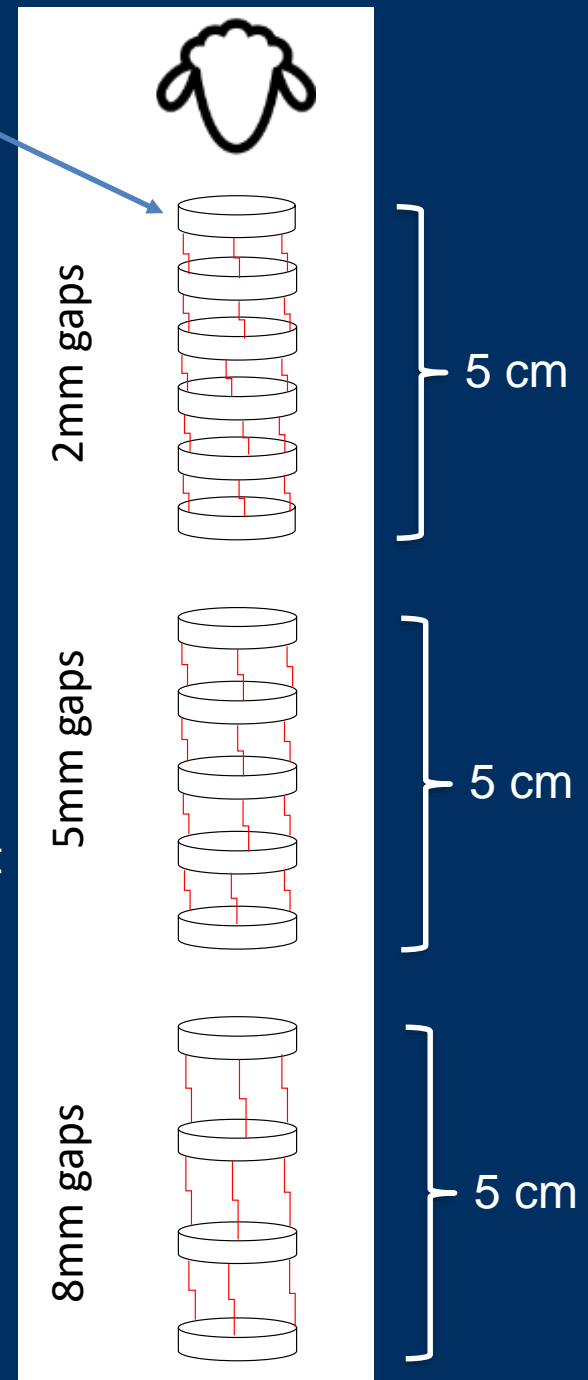
- female Rhone Sheep
- Mean age 3 y/o
- Mean weight 63 kg (55.2-70.0)



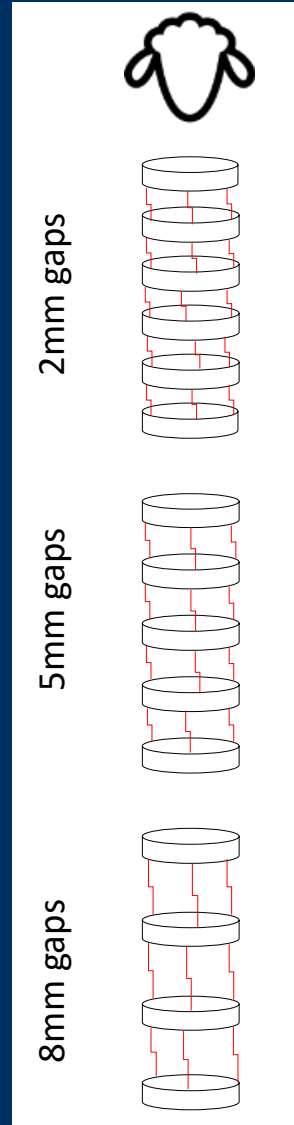
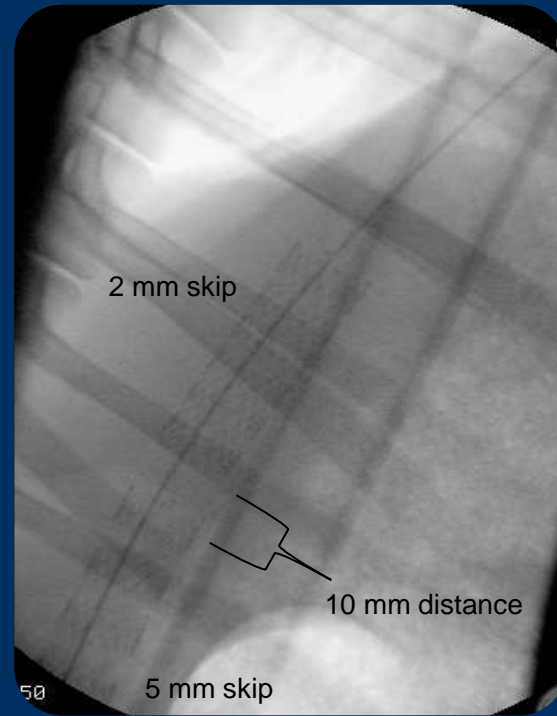
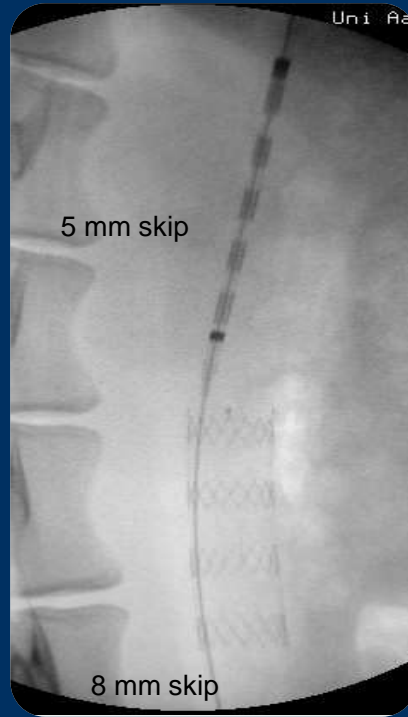
- Target vein: IVC (\varnothing 16mm)
- Access site: right IJV
- Technique of intervention similar to real patient
- 3 segmented nitinol self expandable stents with different lengths of skipped segments (based on Sinus Venous)
 - 2mm, 5mm, 8mm



\varnothing 18 mm



Procedure

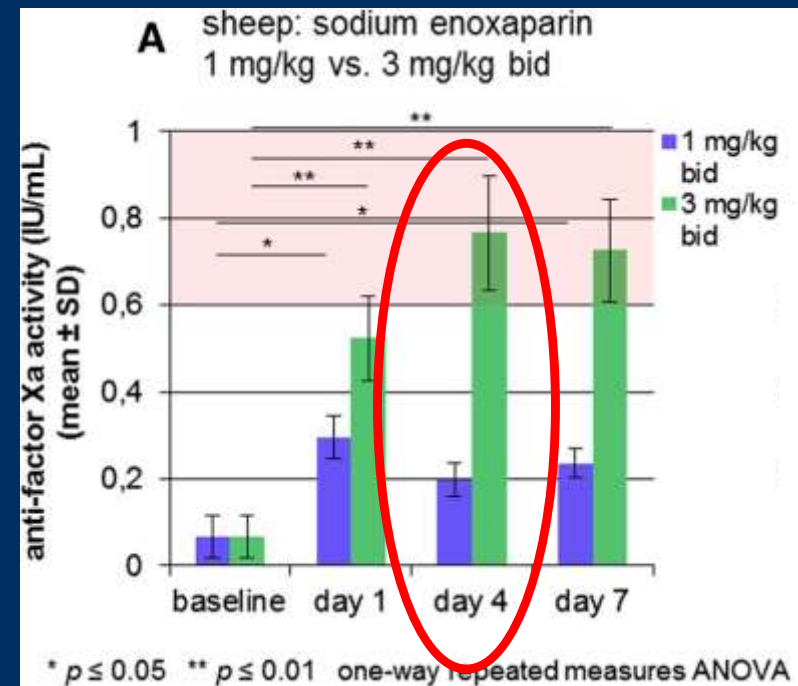


Anticoagulation

- Enoxaparin 3mg / kg bid s.c.
- Starting 3 days before the procedure

New aspects on efficient anticoagulation and antiplatelet strategies in sheep

Annika Weigand^{1†}, Anja M Boos^{1†}, Jürgen Ringwald², Maren Mieth³, Ulrich Kneser^{1,4}, Andreas Arkudas¹, Oliver Bleiziffer¹, Dorothee Klumpp^{1,4}, Raymund E Horch¹ and Justus P Beier^{1*}



Follow up

Group	Sacrifice	Blood test	DUS	CTV
G1, n=3	6w	6w	After: 3d, 4w, 6w	6w
G2, n=3	3m	3m	After: 3d, 4w, 6w, 3m	3m
G3, n=4	6m	6m	After: 3d, 4w, 6w, 3m, 6m	6m



Postop duplex follow up



Postop CT



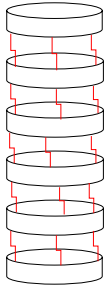
6 weeks postop

3 months postop

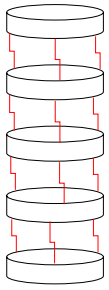
6 months postop



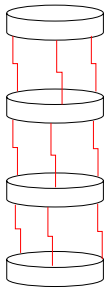
2mm gaps



5mm gaps



8mm gaps

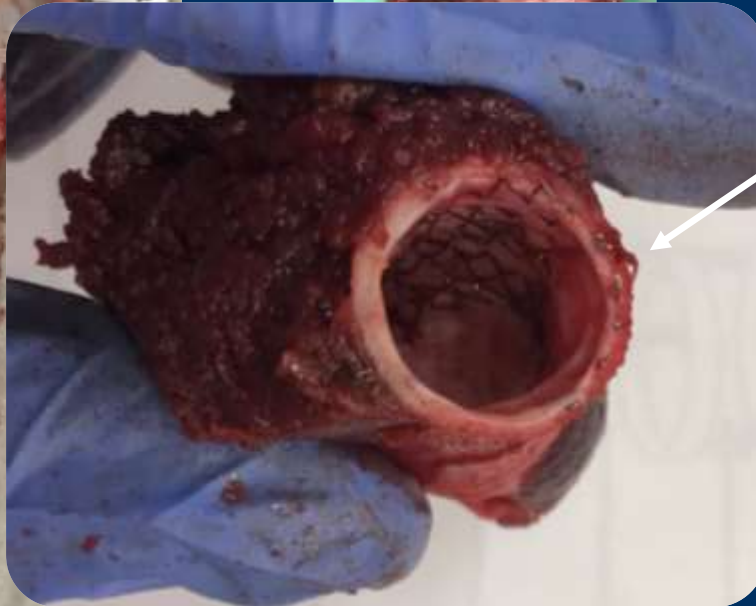


Less than 20% coverage of stent

< 50% coverage



75% coverage



100% coverage

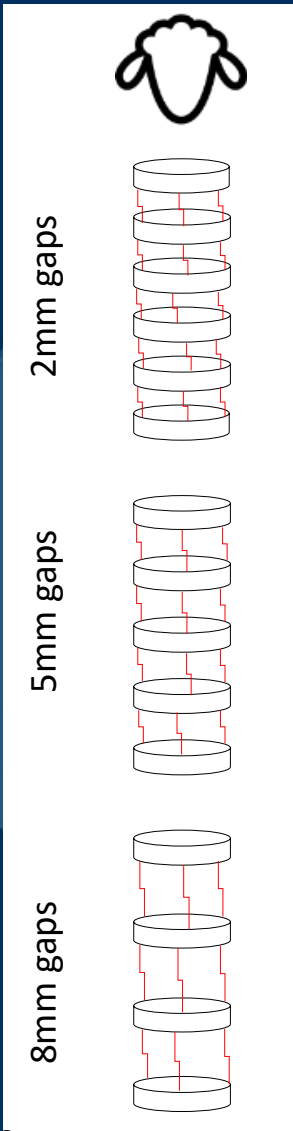


100% coverage

6 weeks postop

3 months postop

6 months postop



Less than 20% coverage of stent

< 50% coverage



50-75% coverage



100% coverage

75% coverage



100% coverage

Results (after 6 months (group 3))

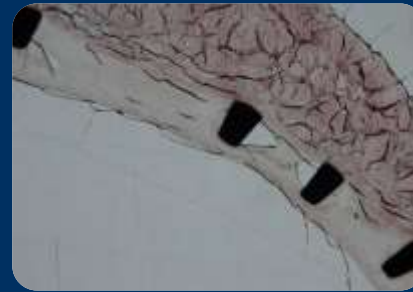
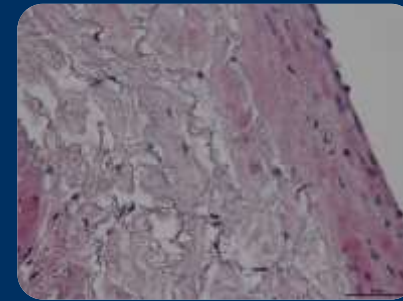
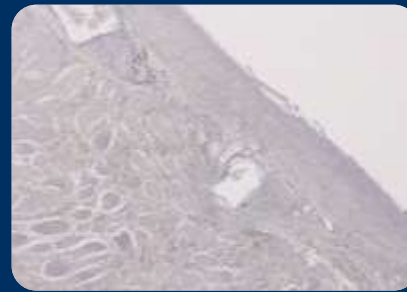
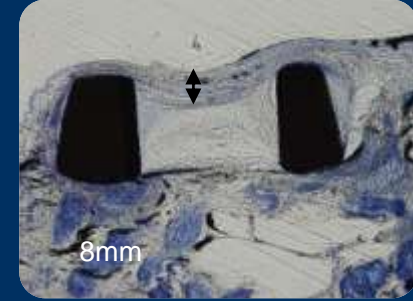
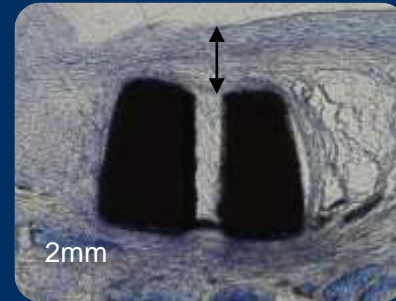
- Microscopic analysis:

- Connective tissue proliferation
- Endothelialization
- Intimal thickness



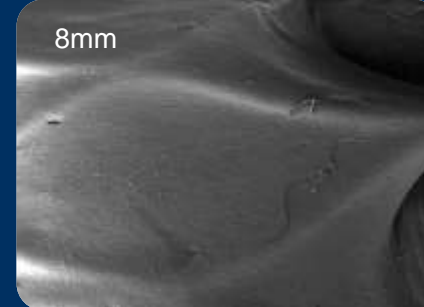
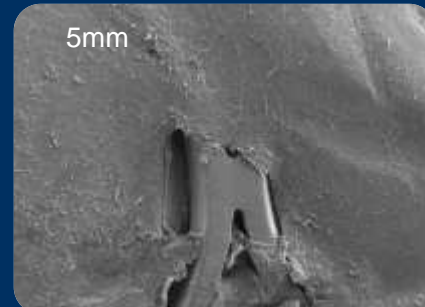
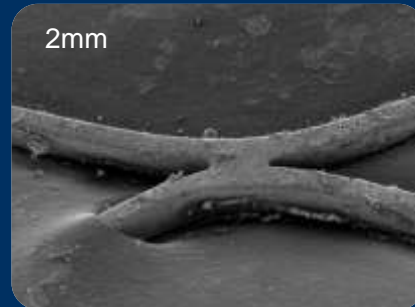
Significant difference

Touloidin-Pyronin



HE

SEM



Summary

- Less material burden showed faster and optimized endothelialization
- Less material burden showed less neointimal hyperplasia
- Overstenting of tributaries did not affect their patency
- More overlap zone between 2 stents might lead to less and worse endothelialization
- Small skip segments are probably not disadvantageous in venous stenting
- At least 6 months of anticoagulation should be administrated

Thank you very much

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