SUPPLEMENTARY INFORMATION

Predicting the Survival of Ischaemic Bowel in Preclinical Model Systems using Intraoperative Near-Infrared Fluorescence Angiography

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Supplementary Table S1 - Region of Interest (ROI) Numbering System for Mesenteric Vascular Occlusion of Pig Bowel.

Length of Ischaemia	N	ROI Number																
		Mesenteric Side (Me)									Anti-Mesenteric Side (AM)							
Short (2-3 cm)	8	1	2	3	n/a	n/a	n/a	3	4	5	6	7	8	n/a	n/a	n/a	8	9	10
Medium (4-5 cm)	8	1	2	3	4	n/a	4	5	6	7	8	9	10	11	n/a	11	12	13	14
Long (6-12 cm)	8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

N = Number of animals in each group; n/a = not applicable

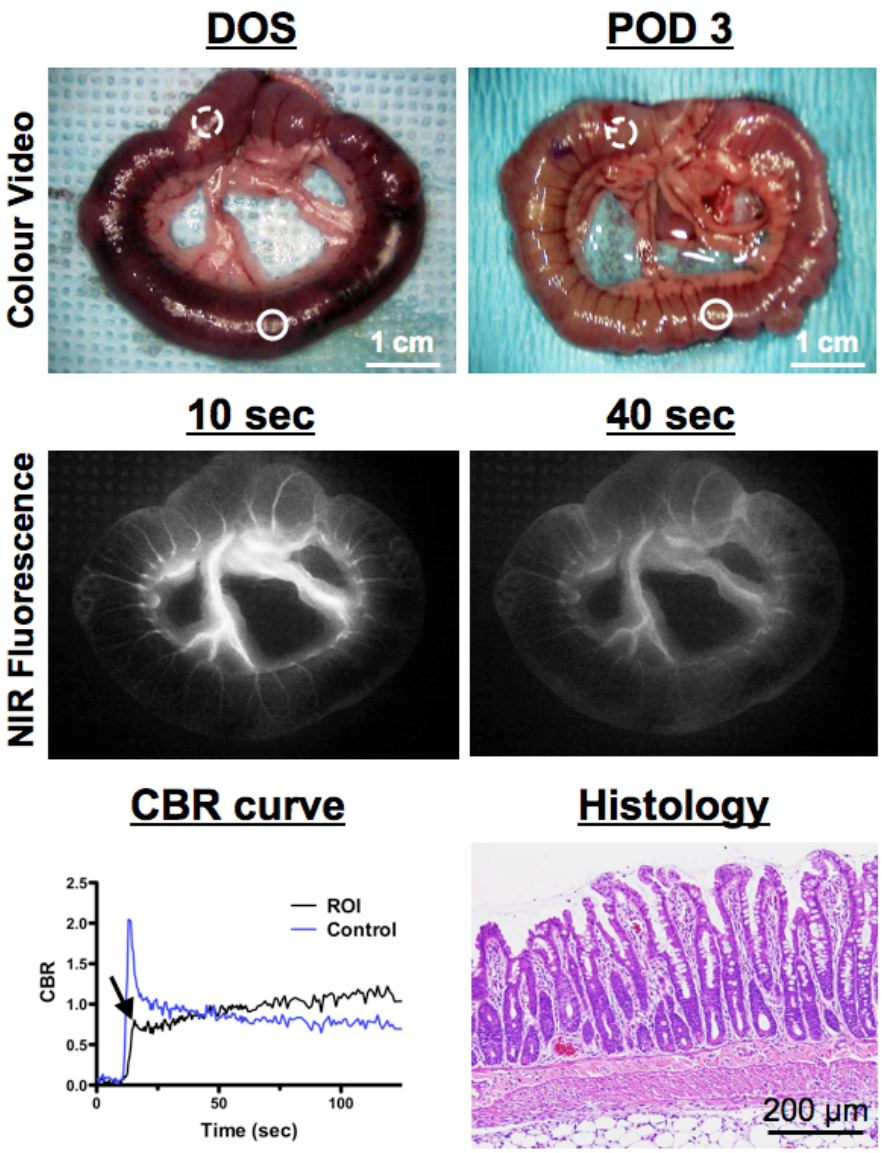
Supplementary Table S2 - Distribution of Perfusion Patterns after Mesenteric Vascular Occlusion of Pig Bowel.

ROI Number		Mesenteric Side									Anti-Mesenteric Side								
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Length of Ischemic Segment	**Short (n = 8)**	A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	A	n/a	n/a	n/a	A	A	A	A	A	A	n/a	n/a	n/a	A	A	A
		A	A	D	n/a	n/a	n/a	D	A	A	A	D	D	n/a	n/a	n/a	D	A	A
	Medium (n = 8)	A	A	D	C	n/a	C	D	A	A	A	A	D	C	n/a	C	A	A	A
		A	A	D	C	n/a	C	D	A	A	A	A	D	C	n/a	C	D	A	A
		A	A	D	C	n/a	C	D	A	A	A	A	D	C	n/a	C	D	A	A
		A	A	D	C	n/a	C	D	A	A	A	A	D	C	n/a	C	D	A	A
		A	A	D	C	n/a	C	D	D	A	A	A	D	C	n/a	C	C	D	A
		A	A	D	C	n/a	C	C	D	A	A	A	D	C	n/a	C	C	D	A
		A	A	D	C	n/a	C	C	D	A	A	A	D	C	n/a	C	C	D	A
		A	A	D	C	n/a	C	C	D	A	A	A	C	C	n/a	C	C	C	A
	Long (n = 8)	A	A	D	C	C	D	D	A	A	A	A	D	C	C	C	C	A	A
		A	A	D	C	C	D	D	A	A	A	A	D	C	C	C	C	A	A
		A	A	D	C	C	C	D	D	A	A	A	D	C	C	C	C	A	A
		A	A	D	C	C	C	D	D	A	A	A	D	C	C	C	C	A	A
		A	D	D	C	C	C	D	D	A	A	D	D	C	X	C	C	D	A
		A	D	C	C	X	C	D	D	A	A	D	C	C	X	C	X	D	A
		A	D	C	C	X	X	C	D	A	A	C	C	C	X	C	X	D	A
		A	D	C	X	X	X	C	D	A	A	C	C	X	X	C	X	D	A

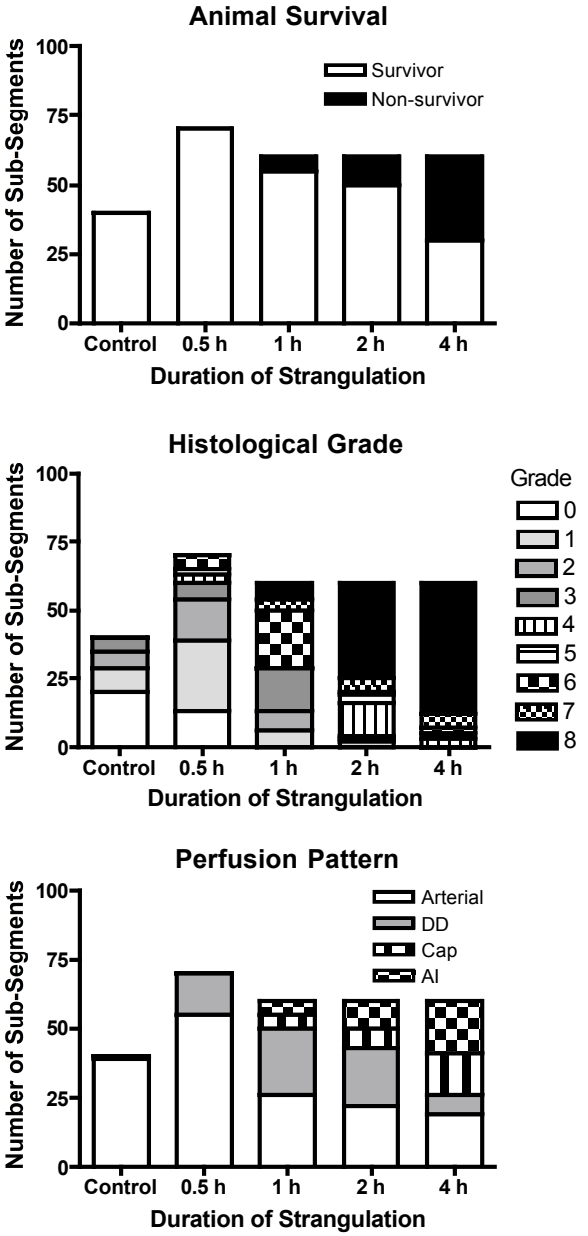
A = Arterial Pattern, D = Delayed Drainage Pattern, C = Capillary Pattern, X = Arterial Insufficient Pattern, n/a; not applicable.

Table S3 – Microscopic criteria in the grading of intestinal tissue injury after strangulation ischaemia and the distribution of histological grade in evaluated intestinal specimens.

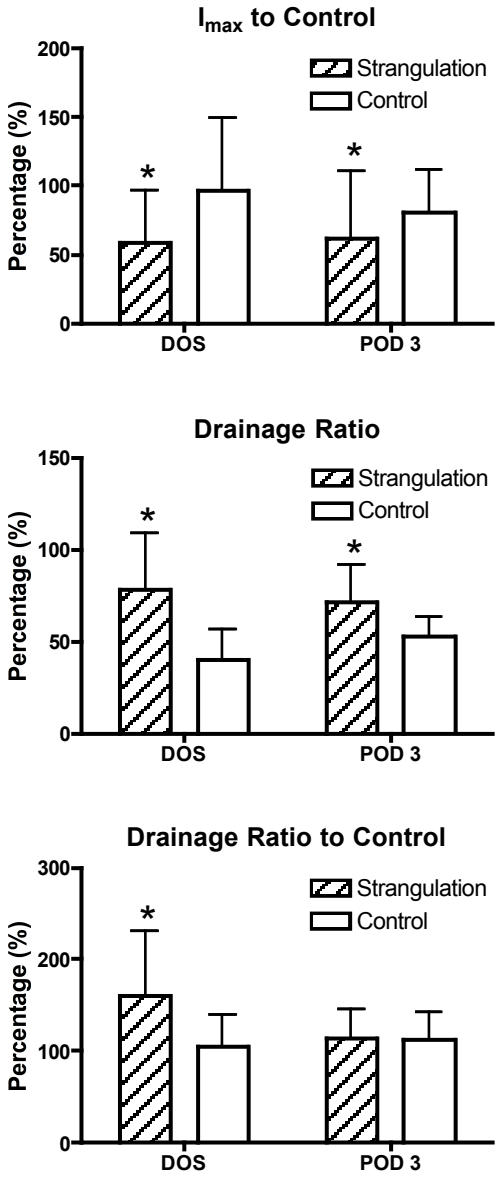
Grade	Description	Number of Specimens
0	Normal mucosa	33
1	Subepithelial space at villus tip	43
2	More extended subepithelial space	29
3	Epithelial lifting along villus sides	28
4	Denuded villi	18
5	Loss of villus tissue	7
6	Crypt layer infarction	29
7	Transmucosal infarction	14
8	Transmural infarction	89



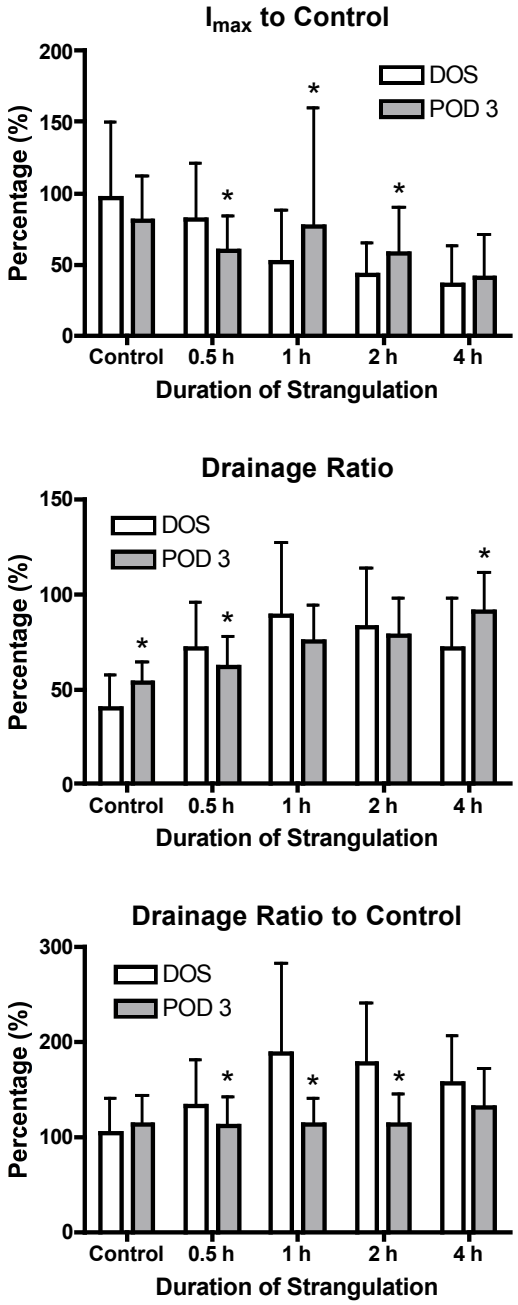
Supplementary Figure S1 – Macroscopic, Physiologic, and Microscopic Analysis of Bowel Strangulation in the Rat: Macroscopic colour video image seen at 1 h of strangulation on the day of surgery (DOS; top left) and at 3 days postoperatively (POD 3; top right). ROI (circle) of ischaemic bowel and ROI (dashed circle) of control bowel are also shown. The ischaemic ROI was judged clinically to be nonviable at DOS, but was actually found to be viable at POD 3. No fluorescence defect was recognized in the NIR fluorescence image at 10 s (middle left) or 40 s (middle right) postinjection of 0.15 mg/kg ICG on the DOS. An inflow peak was present in the CBR-time curve of both ischaemic bowel (arrow) and control (bottom left). Camera exposure time was 60 ms. Histological grade was assessed as Grade 2 (bottom right) according to the criteria described in Table S3.



Supplementary Figure S2 – Clinical and qualitative CBR-time curve outcomes as a function of strangulation duration: Shown are animal survival (top), histological grade (middle), and tissue perfusion pattern (bottom) on POD 3 as function of duration of strangulation and the number of sub-segments involved. Vascular patterns included normal (arterial), DD = delayed drainage pattern, Cap = capillary pattern, and AI = arterial insufficient pattern.



Supplementary Figure S3 – Impact of the presence or absence of strangulation on quantitative metrics of tissue perfusion: Shown are the I_{max} to control ratio (top), drainage ratio (DR) (middle), and DR to control (bottom) in the presence or absence of strangulation, and on the day of surgery (DOS) vs. post-operative day 3 (POD 3). Box and error bar represent mean and SD, respectively. Asterisks indicate statistical significance as described in the text.



Supplementary Figure S4 – Impact of strangulation duration on quantitative metrics of tissue perfusion: Changes in the I_{max} to control ratio (top), drainage ratio (DR; middle), and DR to control (bottom) as a function of the duration of strangulation, and on the day of surgery (DOS) vs. post-operative day 3 (POD 3). Box and error bar represent mean and SD, respectively. Asterisks indicate statistical significance as described in the text.