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Efficacy of Single-Layer Continuous Suture in Colonic Anastomoses: A Comparative Experimental Study in a Rabbit Model

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Purpose To evaluate the safety and healing properties of single-layer continuous suturing in colonic anastomoses by analyzing clinical and histomorphological outcomes in an experimental setting

MATERIALS AND METHODS

108 male rabbits of the breed "chinchilla", age - 5-6 months, body weight 3-3.5 kg

Group I (n=36)
Single row continuous suture with visual control over the entire circumference of the intestine

Group II (n=36)
Single row continuous seam with the strengthening of a separate host seams

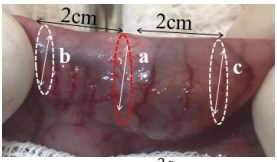
Group III (n=36)
Single-row suture continuous suture through all layers

Animals are divided into equal subgroups:
With the use of threads with antibacterial (AB) coating and without (A)

Macroscopic evaluation and histological study at 3, 7, 14 and 21 days

RESULTS

Calculation of the degree of narrowing of the anastomosis by the method of T. Irvin



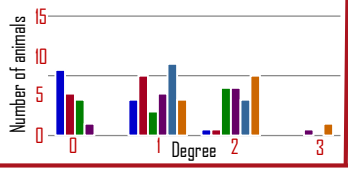
$$(IS) = 100 \times (1 - \frac{2a}{b + c}), (\%)$$

The index of stenosis (IS), %

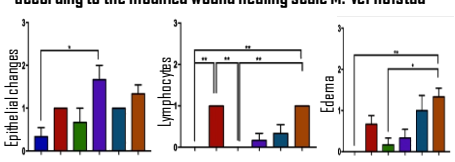
Day	Group I		Group II		Group III	
	IAB	IB	IIAB	IIB	IIIAB	IIIB
3	16.1±2.4	23.4±1.1	20.4±2.1	30.5±1.4	35.7±0.8	49.2±1.8
7	11.3±0.7	14.2±0.9	14.2±1.7	21.2±0.7	22.1±2.2	40.6±1.1
14	5.6±0.9	12.8±1.0	10.9±0.6	15.4±2.3	18.9±1.3	26.7±3.2
21	3.6±0.9	9.5±0.8	5.4±3.3	10.9±1.7	11.9±2.9	24.2±1.8
M±m	9.1±1.2	14.9±0.9	12.7±1.9	19.5±1.5	22.1±1.8	35.2±1.9

IAB
IB
IIAB
IIB
IIIAB
IIIB

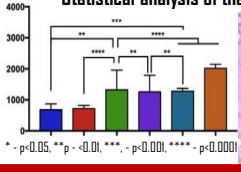
Degree of adhesive process (D.M. Evans model)

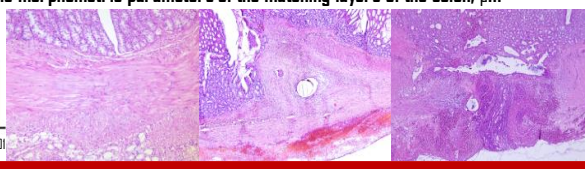


Semi-quantitative score of the anastomosis zone according to the modified wound healing scale M. Verhofstad



Statistical analysis of the morphometric parameters of the matching layers of the colon, μm





CONCLUSIONS

- Single-layer continuous seromuscular-submucosal suturing minimizes postoperative stenosis and adhesions in colonic anastomoses
- Antibacterial-coated sutures further mitigate inflammation, suggesting enhanced safety and efficacy for clinical translation