Fibrin sealant (Tissucol) enhances tissue integration of condensed polytetrafluoroethylene meshes and reduces early adhesion formation in experimental intraabdominal peritoneal onlay mesh repair.

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Abstract:

BACKGROUND: The laparoscopic intraabdominal peritoneal onlay mesh repair (IPOM) is a common technique for the reinforcement of multiple ventral hernias or defined defects after laparotomies. However, the placement of synthetic meshes in the intraabdominal cavity can be associated with severe complications. Adhesions frequently originate from the implant and protruding parts of fixation devices, presenting a serious clinical problem with potentially detrimental consequences. This study was designed to assess the impact of fibrin sealing with Tissucol (FS; Baxter, Vienna, Austria) on adhesion formation to condensed polytetrafluoroethylene meshes (Motif Meshes, MM; Proxy Biomedical, Galway, Ireland) as well as on tissue integration of these implants in experimental IPOM repair in rats. It was tested whether FS application allowed the reduction of sutures for mesh fixation without increasing the risk of mesh dislocation.

MATERIALS AND METHODS: Sixteen rats were assigned to the implantation of MM with four nonresorbable sutures (Synthofil; Ethicon, Norderstedt, Germany) with additional fibrin coating with 0.2 mL FS or to MM fixation with six nonresorbable sutures without FS (n = 8 per group). MM with 2 cm in diameter were implanted in open IPOM by a laparatomy. The observation period of 17 days ensured assessment of adhesions after the full degradation of FS. Adhesions were rated with the

score suggested by Vandendael. Histology was performed.

RESULTS: All eight MMs without FS sealing elicited severe (grade III) adhesions, whereas fibrin-sealed MM were rated mild in 1, moderate in 5, and severe in 2 cases. The superior finding in the FS group was statistically significant. Impaired integration of sutured-only MM was observed in four cases, whereas all FS-sealed MM were well integrated.

CONCLUSIONS: FS improves the tissue integration, reduces early adhesion formation to cPTFE implants, and allows reduction of perforating fixation devices in experimental IPOM repair.