



BIOCOMPATIBILITY OF COLLAGEN MATRICES FOR EQUINES ABDOMINAL WALL REPAIR

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Abstract – Synthetic materials are used in large hernias defects but natural materials are a cheap and useful alternative. In this work were used homolog tendineous diaphragmatic centers treated in alkaline solution, conserved in glycerin 98% solution and to not treated ones for equines abdominal wall repair implants. The biomembranes treated in alkaline solution were more biocompatible than conserved in glycerin 98% and not treated ones, showing a promissory method to obtain biomembranes potentially helpful in surgery.

For small hernia defect re-approximation of the edges and simple closure is sufficient while for large-size one prosthetic material like polypropylene, polyester, poly-acetic and poly-lactic acids should be used. Therefore the purpose of this study was to evaluate the biocompatibility of homolog tendineous diaphragmatic centers treated in alkaline solution compared to conserved in glycerin 98% solution and to not treated ones for equines abdominal wall repair implants. Nine Tendineous diaphragmatic centers (TDC) were obtained from dead or euthanized equines and washed by physiological solution 0.9%. Three TDC were freezing and lyophilized (group 1), three TDC were conserved in glycerin 98% solution for 60 days (group 2) and three TDC were treated in alkaline solution (pH 13) containing chlorides and sulphates of sodium, potassium and calcium for 72 hours, freezed and lyophilized (group 3). Three samples of each where implanted in three different points of 6 horses recto abdominal fascia.

Tissue samples from the implants and roundness were obtained for healing morphometry studies on the seventh, 63rd and 126th post-operative days and the adhesions formation was analyzed during the process. The groups 1 and 2 presented moderated and strong adhesion formation degree while group 3 presented weak ones. Polymorphonuclear and mononuclear cells in the group 3 decrease substantially on 63rd and 126th days. For all groups the macrophage cells count increased on 63rd and decreased on 126th days with difference among group 3 and the others groups. The fibroblast cells increased with the time for the three groups but there was difference on 126th day among group 3 and the others groups. Giant cell was observed just for group 1.

The inflammatory process was acute and the membranes degraded faster for group 3, while in groups 1 and 2 they remained with high number of inflammatory cells as in a chronic inflammatory process. The biomembranes treated in alkaline solution were more biocompatible than conserved in glycerin 98% and not treated ones, showing a promissory method to obtain biomembranes potentially helpful in surgery.

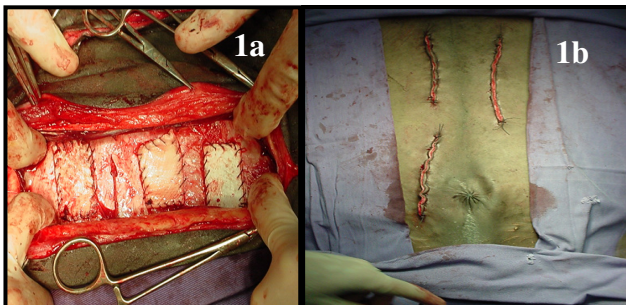


Figure 1: a) Samples of each treatment (groups 1, 2 and 3) implanted in recto abdomen fascia muscle. b) External aspect post-surgical of implantation.

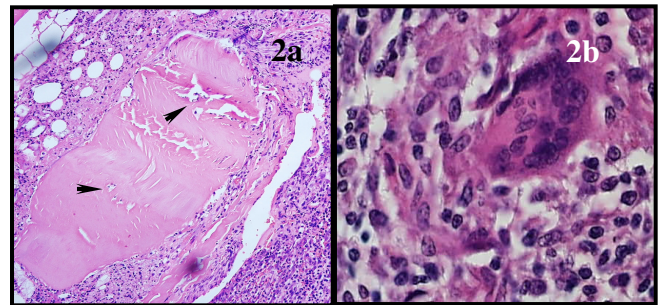


Figure 2: a) Biomembrane treated in alkaline solution. Cells of an acute inflammatory process (arrows) b) Chronic inflammatory process with giant cell in not treated membranes

References

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