

عنوان مقاله:

Characterization of the decellularized ovine pericardium for skin tissue engineering

محل انتشار:

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خلاصه مقاله:

Background and aims: Some biological scaffolds are used as appropriate skin substitutes, including decellularized amniotic membrane ordermis although the ovine pericardial tissue has not been characterized or used for skin tissue engineering. In this regard, this study focused on the decellularization and characterization of ovine pericardium for skin tissue engineering. Materials and Methods: To this end, two different methods were used for decellularization, including safety data sheet (SDS) ۱% (method ۱) and Triton X-۱۰۰ ۱% (method ۲). In addition, histological examinations (H&E staining), DNA content assay, scanning electron microscopy (SEM), MTT test using human adipose-derived mesenchymal stem cells, and tensile tests were conducted for sample characterization. Results: Based on the results, the DNA content showed significant DNA removing ($P < 0.001$) after decellularization with methods ۱ and ۲ in comparison to native tissues although the significance level between the two methods was $P = 0.06$. In the SEM examination, cells were effectively removed while the extracellular matrix remained intact in both groups. Based on the results of the MTT test, the toxicity was not significant ($P = 0.36$). On the other hand, mechanical property assay revealed a higher value of Young's modulus in method ۱ (۳۴.۱۲ MPa) compared to Method ۲ (۳۲.۵۷ MPa) and native tissues (۳۰ MPa). Finally, the highest strain at the break point (approximately ۰.۶) belonged to the native sample. Conclusion: In general, the ovine seems to be a good alternative for skin tissue engineering and regeneration since it is a post-slaughtering waste tissue has low thickness, is wide and spread, and easy to be decellularized with SDS ۱% and Triton X-۱۰۰. Eventually, it has good properties for cell seeding based on the findings of our study and the capability of vascularization reported in the literature.

کلمات کلیدی:

Ovine pericardium, Acellular, Skin tissue engineering

لینک ثابت مقاله در پایگاه سیویلیکا:

