

PCL&Silk 혼합 지지체를 이용한 인공식도의 개발

한림대학교 의과대학 이비인후과학교실

정은재 · 박찬흠

Background

Several auto or alloplastic esophageal substitutes have been used for esophageal reconstruction. However, there is no ideal esophageal substitute that is biocompatible and offers adequate mechanical properties. Recently, tissue engineering of the autologous esophagus has been thought to provide a promising strategy for esophageal substitution. In this study, poly (ϵ -caprolactone)(PCL) scaffolds modified with silk fibroin was used as a scaffold for regeneration of the esophagus in a rat model.

Materials & Methods

Nanofibers of artificial esophagus were fabricated by electrospinning. The structures and properties of the resulting artificial esophagus was characterized using scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR) and tensile strength. Ten Adult Sprague-Dawley rats

were used as recipients. Circumferencial defects created in the cervical esophagus were replaced by artificial esophagus. The specimen was examined macroscopically as well as microscopically.

Results

Five rats survived without complications. The graft site did not show esophageal stenosis or dilatation in any rat. Keratinized stratified squamous esophageal mucosa was regenerated 2 weeks after implantation in all survived rats. Regeneration of the muscle layer or lamina muscularis mucosae in the graft site was not observed.

Conclusion

Artificial esophagus using poly (ϵ -caprolactone)(PCL) scaffolds modified with silk fibroin provided satisfactory regeneration of the esophagus.