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POLY (DL-LACTIDE-CO-GLYCOLIDE) (PLGA) MICROPARTICLES AS A POTENTIAL INJECTABLE BULKING AGENT

Hypothesis / aims of study

Injection of bulking agents has been used in the endoscopic treatment of urinary incontinence. The ideal bulking agent for the injection therapies must be easily injectable, biocompatible, volume-stable, non-antigenic and non-migratory. The aim of this study is to evaluate whether poly (DL-lactide-co-glycolide) (PLGA) microparticles have appropriate properties as an injectable bulking agent.

Study design, materials and methods

30 female Sprague-Dawley rats (4-week-old) were randomized into two groups. In group I and II, 0.05ml of PLGA particle suspension and 0.05ml of PLGA particle suspension mixed with adipose stroma vascular (SVF) cells were injected into bladder wall, respectively. At 2,8,12 weeks of PLGA microparticles implantation, 5 rats in each group were sacrificed and implants were retrieved. Each injection site was analysed and compared grossly and histologically between groups. The whole distant organs of the microparticle-implanted rats, including the liver, kidney, spleen and lung were also harvested and examined histologically to determine microparticle migration to the distant organ.

Results

There was no evidence of complications including swelling or erythema at the injection sites. At 12weeks of implantation, 70% of injected volume was maintained and there was no significant difference between groups (Figure 1). In histological analyses, injected PLGA particles were localized in muscular layer of bladder without infiltration into adjacent layer. At 8weeks and 12weeks of implantation, hybrid tissues contained muscle and collagen were observed between PLGA microparticles by immunostaining for α-actin and collagen and these findings were more clear in group II. There were no PLGA migration to other organs and no abnormalities in weight gain and hematologic values.

Interpretation of results

At 12weeks of PLGA implantation, reasonable maintenance of volume and hybrid tissue growth in injection site were observed and hybrid tissue formation may be improved with SVF cells.

Concluding message

These results suggest the possibility of PLGA microparticles as a potentially useful bulking agent in urologic field and further investigation is needed to know long-term effect and safety of PLGA particle and SVF cell.

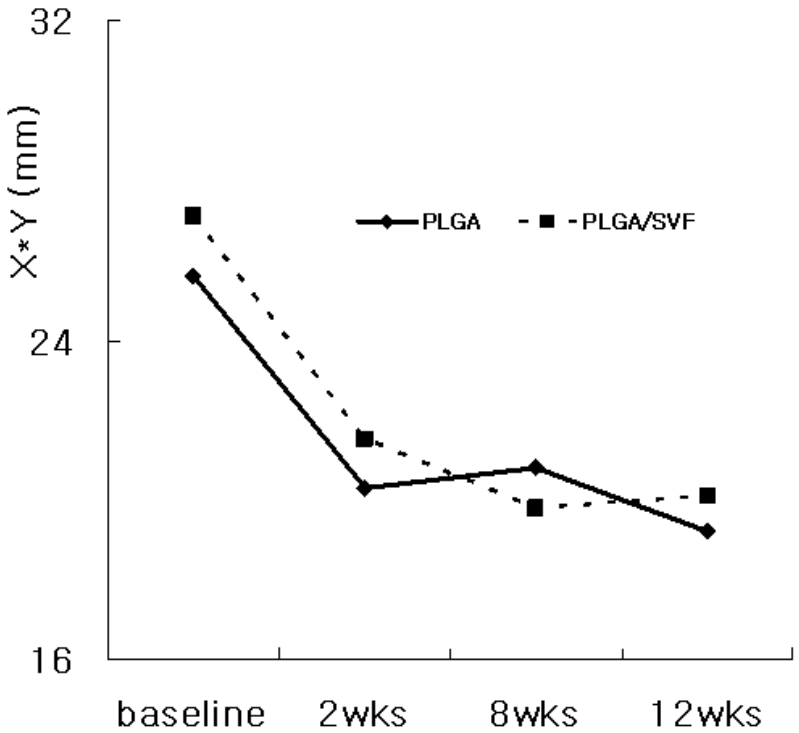

Figure 1. The voulme of injected PLGA particles over time

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Is this a clinical trial?	**No**
What were the subjects in the study?	**ANIMAL**

Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?	**Yes**
Name of ethics committee	**Animal Ethics Committee of Chuncheon Sacred Heart Hospital**