

00576 Preparation and characterization of paclitaxel-loaded PLGA coating tracheal stent

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Preparation and characterization of paclitaxel-loaded PLGA coating tracheal stent

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[Abstract]

Background: In-stent restenosis caused by airway granulation poses a challenge due to the high incidence of recurrence after treatment. Weekly applications of anti-proliferative drugs have potential value in delaying the recurrence of airway obstruction. However, it is not practical to subject patients to repeated bronchoscopy and topical drug applications. Objectives: Thus, we fabricated novel paclitaxel (PTX) -eluting tracheal stents with sustained and slow PTX release, which could inhibit the formation of granulation tissue. And we assessed the quality and drug release behaviors of drug-eluting stents (DESs) in vitro.

Methods: Stents were dipped vertically into a coating solution prepared by dissolving 0.5g (2% w/v) of PLGA and 0.025g (0.1% w/v) of PTX in 25 ml of dichloromethane. DES morphology was examined by scanning electron microscopy (SEM). PTX release kinetics from these DESs in vitro was investigated by shaking in PBS buffer followed by high performance liquid chromatography (HPLC).

Results: Using an orthogonal experimental design, we fabricated numerous PTX/PLGA eluting tracheal stents to assess optimum coating proportions. The optimum coating proportion was 0.1% (w/v) PTX and 2% (w/v) PLGA, which resulted in total PTX loading of 16.3806 ± 0.0021 mg/stent. By SEM, coating was very smooth and uniform. PTX released from DES was at 0.3763 ± 0.0038 mg/day, which was at therapeutic levels. There was a prolonged, sustained release of PTX of >40 days.

Conclusions: Our novel paclitaxel-eluting tracheal stents may be useful for preventing complications caused by the formation of granulation tissue after tracheal stent implantation.

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