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Abstract
In this study, UV polymerization was used to prepare the hydrogels composed of Chitosan, acrylic acid (AAc) and 2-Hydroxyethyl methacrylate (2-HEMA). The epidermal growth factor (EGF) was incorporated inside the hydrogels to stimulate the wound healing. The results indicate that hydrogels after UV polymerization had a swelling ratio of 4.32 (w/w), a water content of 80.6%, a water vapor transmission rate of 1732 (g/m2/day), and a compressive strength of 0.34 MPa with 53.4% compressive strain, and 15% acceleration thrombus formed rate was obtained.
Chitosan-PAA-pHEMA hydrogel also had good ability of antibacterial in Staphylococcus aureus, Escherichia coli, and Pseudomonas aerus. The release of EGF reached 50% in the first day and the effect would continue for 7 days. The result of cell culture indicates all the prepared hydrogels were non-toxic material which may help cell adhesion and proliferation. The animal test indicates Chitosan-PAA-pHEMA hydrogel incorporated EGF could accelerate wound close up rate. The Chitosan-PAA-pHEMA hydrogel prepared in this study may be a potential candidate used as a wound dressing material.
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