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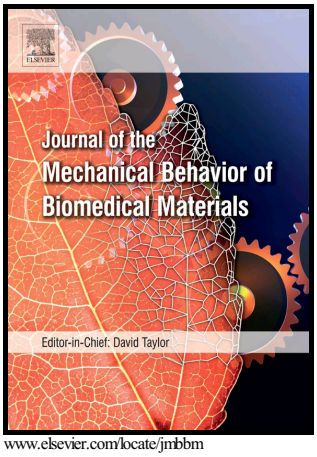

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Preparation of a partially carboxymethylated cotton gauze and study of its hemostatic properties

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Abstract: In this study, we attempted to modify cotton gauze by partial carboxymethylation by varying the reaction time and concentration of monochloroacetic acid and sodium hydroxide. For each experiment, the relative value of the degree of substitution (DS) of the modified cotton gauze was evaluated and the whole blood clotting time (WBCT) and water absorption property were compared with cotton gauze and Surgicel. This revealed that, following an initial decrease, WBCT gradually increased. Using rabbit ear artery and liver haemorrhage models, the performance of the optimal modified gauze was compared to that of Surgicel and unmodified cotton gauze. The average bleeding times in the presence of modified cotton gauze in the rabbit ear arteries and the liver were 51.7 s and 60.6 s, while those with Surgicel and the unmodified cotton gauze were 76.8 s and 95.5 s, and 93.2 s and 129.2 s, respectively. The hemostatic and biocompatibility properties were evaluated using in vivo degradation experiments. This revealed that the modified gauze and Surgicel were totally degraded within 6 weeks.

Key words: modified cotton gauze, whole blood clotting time, hemostatic properties, in vivo degradation

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