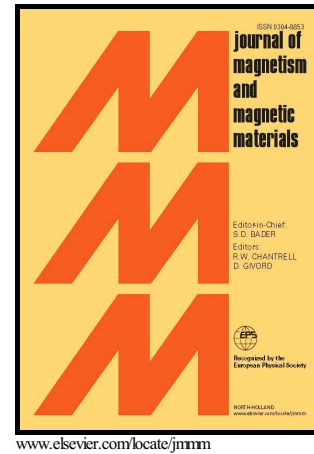


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S.N. Mirzababaei, Tahereh B. Gorji, M. Baou, M. Gorji-Bandpy, Nasser Fatouree



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Investigation of magnetic nanoparticle targeting in a simplified model of small vessel aneurysm

S.N. Mirzababaei^a, Tahereh B. Gorji^{b*}, M. Baou^b, M. Gorji-Bandpy^b, Nasser Fatourae^c

^a Department of Chemical Engineering, Noshirvani Babol University of Technology, Babol, Iran

^b Department of Mechanical Engineering, Noshirvani Babol University of Technology, Babol, Iran

^c Department of Biomedical Engineering, Amirkabir University of Technology, Tehran, Iran

***Corresponding author at:** Department of Mechanical Engineering, Noshirvani Babol University of Technology, **P.O. Box** 484, Babol, Iran. **Tel.:** +98 1132320740; **fax:** +98 1132334201. gorji.tahereh@stu.nit.ac.ir

Abstract

An in simulacra study was conducted to investigate the capture efficiency (CE) of magnetic nanoparticles (MNPs) in aneurysm model, under the effect of a bipolar permanent magnetic system positioned at the vicinity of the model vessel. The bipolar magnetic system with an active space of 9 cm was designed by FEMM software. The MNPs were magnetite nanoparticles synthesized by the hydrothermal method which were characterized by X-ray diffraction, Fourier transform infrared spectroscopy, scanning electron microscope and magnetometer measurements. Ferrofluid velocity, magnetic field strength, and aneurysm volume all proved to be important parameters which affect the capturing of MNPs. Overall, the results of this in simulacra study confirmed the effectiveness of magnetic targeting for possible aneurysm embolization.

Keywords: Magnetic drug targeting, Magnetic drug particle, In simulacra, Aneurysm embolization.

1. Introduction

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