



Fabrication of stent with superelastic/ shape memory nitinol alloy for femoral vessel

Authors:

(1)S. Noroozi (2)S. K. Sadmezhaad

University: Islamic Azad University, Science and Research Branch, Tehran, Iran

Correspond Author E-mail: sidra.noroozi@yahoo.com

Trace Code: Majlesi-FA-77-1019

Abstract:

Stent is a metal mesh tube for opening of the obstructed vesseles. Nitinol alloy is a suitable material for fabrication of stent; due to its potential for applying the appropriat stress and strain. In this study, whit using of superelastic nitinol wire, a kind of spring stent was built for using in the femoral vessel. For comparison of transformation temperature with body condition and adjustment shape memory to superelasticity ratio in the desirable level, ageing treatment was performed in 500 °C and the ageing time was 1/5 hour. Mechanical and structural properties of alloy were determined by differential scanning calorimetry (DSC) and electron probe micro analysis (EPMA) and metallographic studies. Ability of stent for tolerance pressure of vessel wall was surveyed by crushing test. Images of scanning electron microscope (SEM) were shown the surface integrity is maintained under strain. The artificial silicon vessel in simulated body fluid (SBF) at 37°C was used for implanting crimping stent. The recovery of strain and exertion of stress to vessel wall was investigated after the stent exit from catheter and implant in vessel. The results were compared to standard data

Keywords: *ORTHODONTIC WIRE, STENT, SUPERELASTICITY, SHAPE MEMORY, NICKEL-TITANIUM ALLOY*

1- Department of Medical Engineering, Islamic Azad University, Science and Research Branch

2- Department of Materials Science and Engineering, Sharif University of Technology