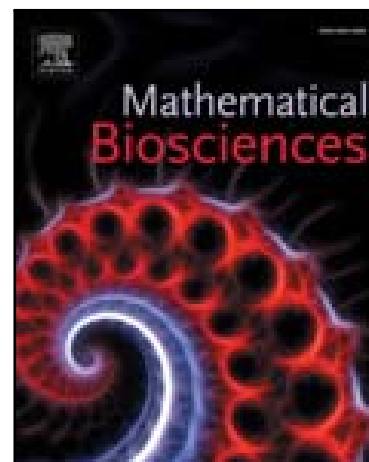


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The influence of atherosclerotic plaques on the pharmacokinetics of a drug eluted from bioabsorbable stents

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Abstract

In this paper the effect of plaque composition, on the accumulation of drug released by a drug eluting stent, is analyzed. The mathematical model is represented by two coupled systems of partial differential equations that describe the pharmacokinetics of drug in the stent coating and in the arterial wall. The influence of the stiffness and porosity of soft and hard plaques is studied. A case study based on optical coherence tomography images is also included.

Keywords: Atherosclerotic plaque, porosity, drug eluting stent, numerical simulation

1 Introduction

Cardiovascular diseases are the leading cause of mortality in the world. They are responsible for the death of 17.3 million people and this number is expected to increase to more than 23.6 million by 2030. Among cardiovascular diseases, atherosclerosis that is characterized by the narrowing and hardening of some arteries that start thickening and eventually occlude, is the most common. This process normally happens over a period of 50 to 60 years and seems to get particularly severe

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