عنوان مقاله:

Effect of Dogboning on the Restenosis Rate after Coronary Stenting: A Finite Element Analysis

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خلاصه مقاله:

Stent implantation is one of the most common minimally invasive treatments for opening obstructed coronary arteries. A stent is a mesh structure used to restore the patency in stenosed arteries and provide a permanent scaffold for arterial walls. The permanent implanted stent subjects the artery to abnormal stresses which may lead to the occurrence of in-stent restenosis, a major complication of stenting. Clinical trials have shown that various factors influence on restenosis rates. One of these factors is dogboning (i.e., ends of stent open first during expansion because of different distribution of circumferential stress between free ends and central part of the stent). One of the most important issues that affect the dogboning value is stent cell geometry. Published works on the effect of different stent geometries on the dogboning by computer simulation are rarely found in the literature and the current knowledge is mostly clinical. The goal of this paper is to quantitatively assess the relationship between the reported restenosis rates and the dogboning value of a stent through finite element method. The impact of three commercially stent designs (Palmaz–Schatz, Multi–Link and NIR stents) on the dogboning was characterized. Radial deformation and dogboning changes during the deployment of the stents are compared. According to the findings, Palmaz–Schatz stent has the most value of dogboning, followed by NIR and Multi–Link stents. Results suggested that stent designs cause alterations in dogboning that adversely affect arterial stress distributions within the wall, which impact vessel responses such as restenosis.

کلمات کلیدی:

Finite element analysis, Coronary stent, Plaque, Dogboning, Restenosis rate

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