The design, optimization and surface treatment of 3D self-stable artificial vertebral body in cervical diseases: Achievements and Prospects

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主持人：吕本帅 研究员

报告内容摘要：

Anterior cervical corpectomy and fusion is a widely employed surgical intervention for cervical spine disorders. The conventional employment of a titanium cage-plate system may give rise to troublesome complications, like implant subsidence and displacement and esophageal injury. Consequently, we have developed a self-stable 3D artificial vertebral body (AVB) that can adapt to bone biomechanical characteristics, enhance transient stability, and promote bone ingrowth, reducing implant sinking and esophageal incisions. Micro-CT and clinical follow-up has provided its effectiveness.

In this presentation, I will introduce the achievements we have made in the design, optimization, and surface treatment of 3D self-stable AVB in cervical spine diseases. Furthermore, I will discuss the prospects of cervical spine implants with the audience. We utilized machine learning methods to optimize the shape, size and distribution of micropores structure and tried to apply micro-sensors for stress measurements in the cervical spine and deepen our understanding in biomechanics. However, there is still much unknown in further optimizations in biomechanics, materials, structure, and surface treatment. As general and fundamental questions, these optimization methods hold significant value for all orthopedic implants.

报告人简介:

周非非，北医三院骨科副主任，教授，主任医师，博士研究生导师，博士后合作导师，颈椎专业组组长。北京市高等学校青年教学名师。中国康复医学会颈椎病专业委员会常务委员、青年委员会主任委员；中国康复医学会脊柱脊髓专业委员会青年委员会副主任委员；中华医学会骨科分会创新与转化学组委员；中国研究型医院学会颈椎疾病健康管理与加速康复专业委员会常委兼秘书长；国际 AOSpine 讲师，颈椎研究协会（CSRS）北美会员、亚太分会理事；《中华医学杂志》、《中国微创外科杂志》、《骨科》、Frontiers in Surgery 编委；《中国脊柱脊髓杂志》、BMC Musculoskeletal Disorders、Scientific Reports 审稿专家；国家自然科学基金评阅专家。专业方向为颈椎退行性疾患、畸形等方面的基础及临床研究。主持国家自然科学基金面上项目 2 项、科技部国家重点研发专项课题 2 项、北京自然科学基金 1 项、首都卫生发展科研专项 1 项、AOSpine 亚太多中心临床研究项目 1 项。近 5 年发表 SCI 学术论文 24 篇，中文核心期刊论著 24 篇，主译论著 2 部，参编参译专著 11 部，获得国家发明专利 2 项、实用新型专利 10 项。2014-2016 年作为访问学者在美国 Emory University Spine Center，哈佛大学麻省总医院进修学习。

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