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LETTER

3D Printing for Personalized Solutions in Cervical Spondylosis [Letter]

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Dear editor

I write in response to the study by Wu at el[1] which reviews the applications of 3D printing technology in the treatment of cervical spondylosis. Cervical spondylosis is a degenerative spinal condition with profound impact on patient quality of life. Current management strategies to treat this condition include conservative measures such as the use of analgesia and physiotherapy, with surgical intervention reserved for severe cases. The authors highlight the potential 3D printing offers with regards to this condition and particularly its ability to provide personalized treatment solutions, which is a promising area in the field of orthopedics.

One of the strengths of the paper is the detailed discussion of the various ways in which 3D printing can be used in the treatment of cervical spondylosis. Such as the manufacture of scaffolds and implants for use in cervical surgery and 3D printed personalized cervical collars. 3D printed models can also be used for clinical teaching and surgical simulation, studies show that 3D printed models help to enhance understanding of complex anatomical structures and improve surgical accuracy.[2] Further to this the authors highlight the relatively quick production of these materials, they argue these benefits help address the limitations of traditional treatment methods.

While the paper provides a thorough overview of the benefits of 3D printing, it could benefit from addressing further the regulatory and approval challenges surrounding the clinical use of 3D printing. Although future advancements in 3D printing are promising, the regulatory framework remains uncertain.[3] The paper provides limited discussion on the issue, which is essential to address as medical innovations must demonstrate safety to be integrated into practice, without clear regulatory guidance, this remains a substantial barrier. Regulatory issues are a significant challenge to overcome in the use of 3D printing for cervical spondylosis.

Another area of importance is biocompatibility. While the authors briefly address this, only one of the seventy-four references included in the paper directly explores biocompatibility issues in the context of 3D-printed implants. This is an important consideration, as implant materials must meet high standards for compatibility with human tissue to avoid adverse effects.[4] Although, the paper effectively outlines the pros and cons of several applicable materials such as polylactic acid (PLA), poly-ε-caprolactone (PCL), ABS, ceramics, hydrogels, and bio-inks, further detail on the long-term biocompatibility of these materials, particularly in sensitive applications such as cervical implants, would add value to the paper.

In summary, the study by Wu et al presents a promising direction for advancing cervical spondylosis management with 3D printing, offering a customizable and personalized approach that complements, rather than replaces, current treatment methods. To build on these findings, further research is needed into regulatory and approval processes for 3D printing in orthopedics, as well as clinical evidence of 3D printing applications in medicine.

I commend the authors' work and their contribution to the advancement of orthopedic research.

Disclosure

The author reports no conflicts of interest in this communication.

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