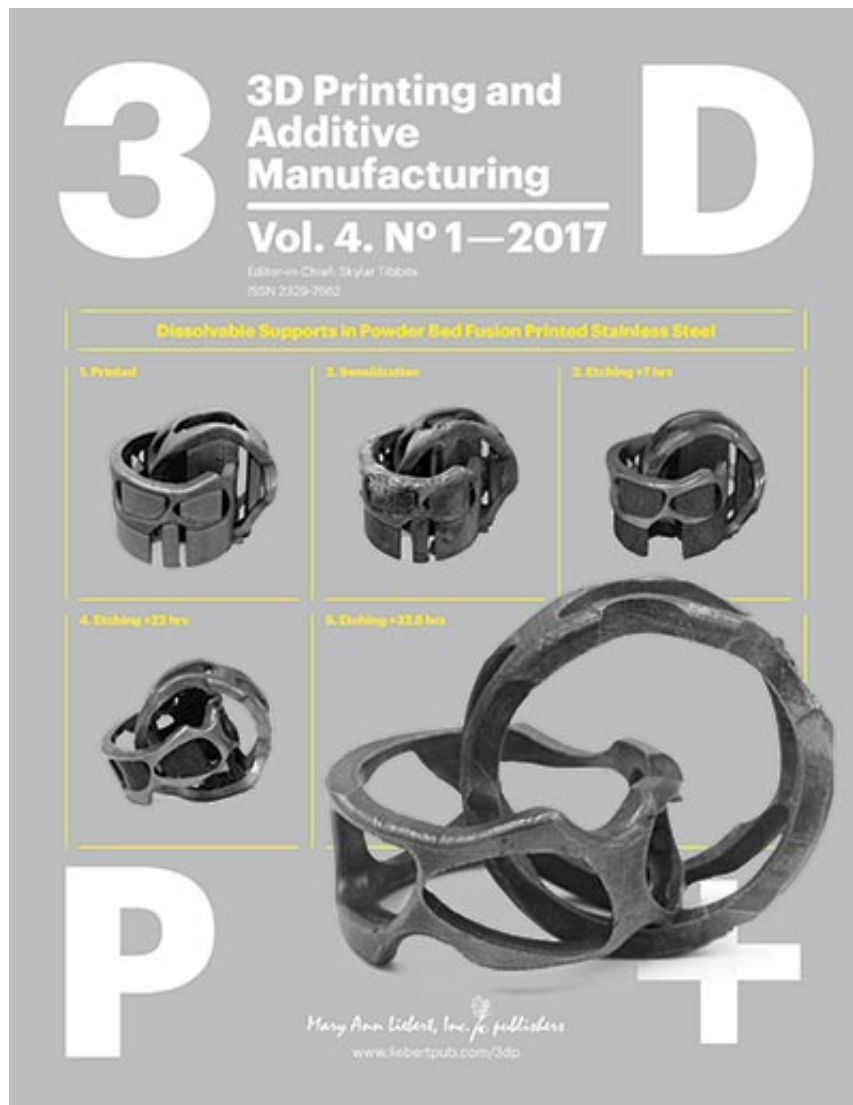


3-D-printed polymer stents grow with pediatric patients and biodegrade over time

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Credit: Mary Ann Liebert, Inc., publishers

A new study demonstrates proof-of-concept for combining computational design and simulation tools with 3D printing technology to produce self-expandable polymer stents that can grow with pediatric patients, are biodegradable, and require only a minimally-invasive procedure for implantation. This innovative method is described in an article in *3D Printing and Additive Manufacturing*.

M.S. Cabrera, B. Sanders, O.J.G.M. Goor, A. Driessen-Mol, C.W.J. Oomens, and F.P.T. Baaijens, Eindhoven University of Technology, the Netherlands, coauthored the study entitled "Computationally Designed 3D Printed Self-Expandable Polymer Stents with Biodegradation Capacity for Minimally-Invasive Heart Valve Implantation: A Proof of Concept Study."

To overcome the current challenges in designing bioabsorbable polymer stents with the necessary [mechanical properties](#) for use in minimally invasive procedures to implant tissue-engineered heart valves in young patients, researchers have developed a novel approach to create stents with growth potential and a sufficient degree of plastic deformation. The rapid prototyping method they describe involves creating an in silico model of a conventional nitinol stent and then translating the computational simulation into prototype stents using 3D printing and a flexible copolyester elastomer. The authors evaluated the mechanical properties of the [stents](#) by subjecting them to crush and crimping tests, and performed accelerated degradation tests to assess their biodegradability.

More information: María Sol Cabrera et al, Computationally Designed 3D Printed Self-Expandable Polymer Stents with Biodegradation Capacity for Minimally Invasive Heart Valve Implantation: A Proof-of-Concept Study, *3D Printing and Additive Manufacturing* (2017). [DOI: 10.1089/3dp.2016.0052](https://doi.org/10.1089/3dp.2016.0052)

Provided by Mary Ann Liebert, Inc

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