**Figure Supplemental Content 1A,B.** Simplified approach to the simulated creation of a customized tracheal stent using a case of significant tracheal stenosis secondary to mass effect.

A) 3D model of a patient’s airway, centered on the desired anatomy, is segmented from CT images based on air density Hounsfield Units (-1024 to -931) in the tracheal lumen. The trachea is a hollow structure with its wall on the outside of intra-luminal air. A solid model of the lumen may then be created. Simulated adjacent tumor creates mass effect on the airway.

1. A cylinder primitive is used to fill the defect created by the tumor, is manipulated to precisely reconstruct the native lumen, and is used to generate a model of the intact airway. The model needs to conform to the inner lumen of the tracheal but not exceed it. The desired wall thickness, typically 3 mm, may be selected. The stent model is trimmed to the desired size and transformed into a printable 3D object using computer graphics and post-processing, making a ready to print model. The process of submitting a model to a 3D printer involves many variables.

Reproduced and modified with unrestrictive access from Springer Open and under the terms of © The Author(s). 2017 Open Access Creative Commons. Chepelev L, Souza C, Althobaity W. Preoperative planning and tracheal stent design in thoracic surgery: a prime for the 2017 Radiologic Society of North America (RSNA) hands-on course in 3D printing. 3D Printing in Med 2017;3:14.

