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3D printed thoracic anatomical models for preoperative planning and education

Who are the patients?
Patients undergoing surgery for diseases of the lungs or the chest wall

What is the problem?
Understanding thoracic anatomy is challenging due to its complex bronchovascular structures and high variability. Moreover, the transition from open to minimally invasive thoracic surgery is hampering anatomical visualization and understanding during surgical procedures.

What is the need?
Accurate 3D physical models can be beneficial tools for learning normal anatomy during surgical training and understanding pathological anatomies during preoperative planning.

What is the benefit (if problem were solved)?

Visualizing directly from handheld 3D printed models allows surgeons and trainees to appreciate better the anatomical relations between the bronchovascular structures and the lesions, identify high-risk areas, define the best surgical approach, and facilitate intraoperative guidance for complex abnormal anatomies. It could also be used to aid patient education.

Wrap up
Chest anatomy understanding is a complex skill to master. It requires years of training to be familiar with normal bronchovascular anatomy, and pathological anatomy can be challenging to understand even for experienced surgeons. 3D printed models of chest diseases can accelerate training and help surgeons before complex procedures.