Biodynamic analysis of adolescent idiopathic scoliosis and its vibration-induced damages

Junde Xie,Li HAN,Ye Li,Shaowei Jia,Jing Cao,Shunxin Zhang,Hufei Yang

Abstract

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Protocol

The patient's CT images is imported into medical image processing software MIMICS, selectively editing the image to extract the vertebrae model

Step 1.

The vertebrae model are imported into Geomagic Studio to optimize the surface of the vertebrae

Step 2.

The optimized model is imported into the 3-matic, and the vertebrae are divided into cortical bone and cancellous bone. Meanwhile, the intervertebral disc are established. Finally, the volume mesh of vertebrae and intervertebral discs are created.

Step 3.

The model of vertebrae and intervertebral disc, the volume mesh was created, are imported into MIMICS to give corresponding material properties

Step 4.

The fully edited spinal model is imported into the finite element software Abaqus, and the constraint condition and interaction are applied and the ligaments are added. Finally, the model validation□modal analysis and harmonic analysis is conducted.

Step 5.