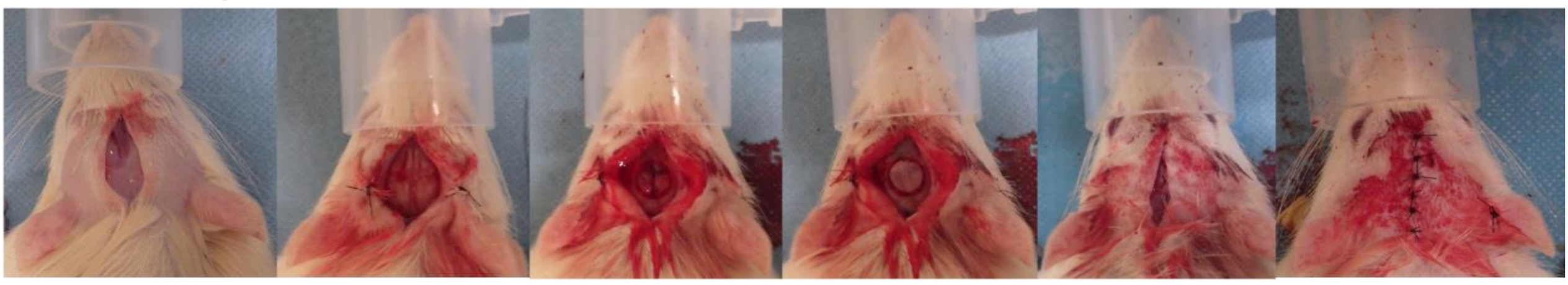
Supplementary Fig. S1

Animal Experiment Procedures

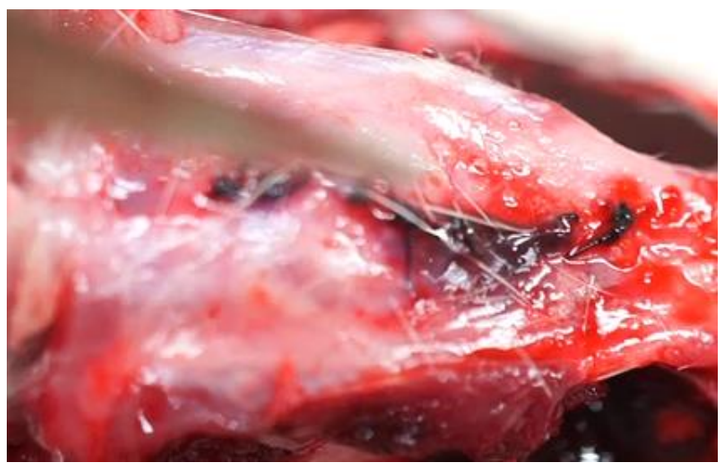


(A) Skin incision, (B) periosteal incision, (C) Bone defect creation
(D) reinsertion of the bone fragment after inactivation treatment,
(E) (F)wound closure

Supplementary Movie. S2 (legend)

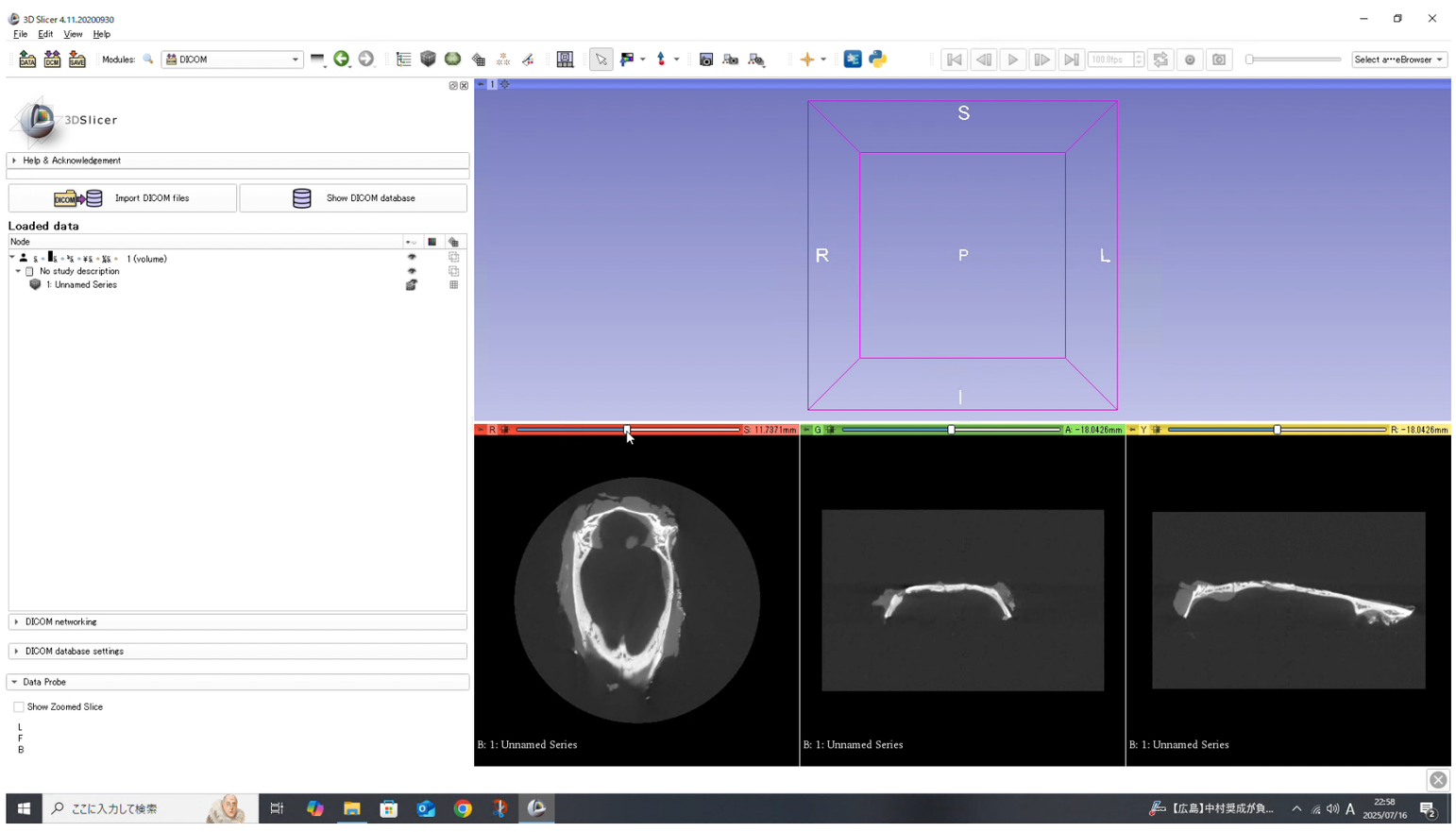
Sample with no float in manual test

Sample with float in manual test



Instability of bone fragments can be palpated beneath the periosteum

Supplementary Movie. S3 (legend)

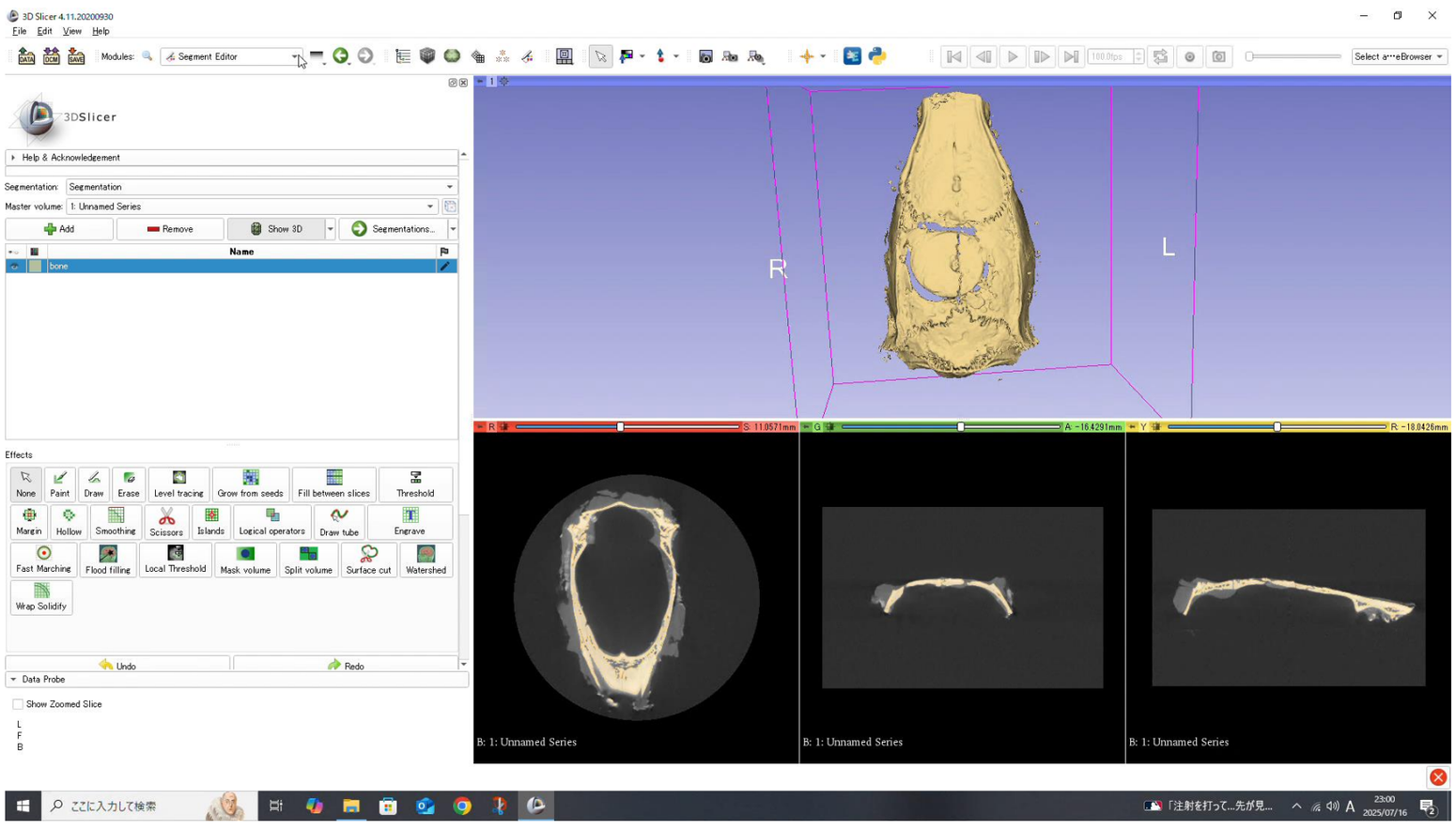


To construct a three-dimensional model from two-dimensional CT images, one should utilize the ‘Segmentation Editor’ in 3D Slicer.

It is essential to determine an appropriate threshold while examining the 2D images, as this threshold will be uniformly applied to all 3D image constructions.

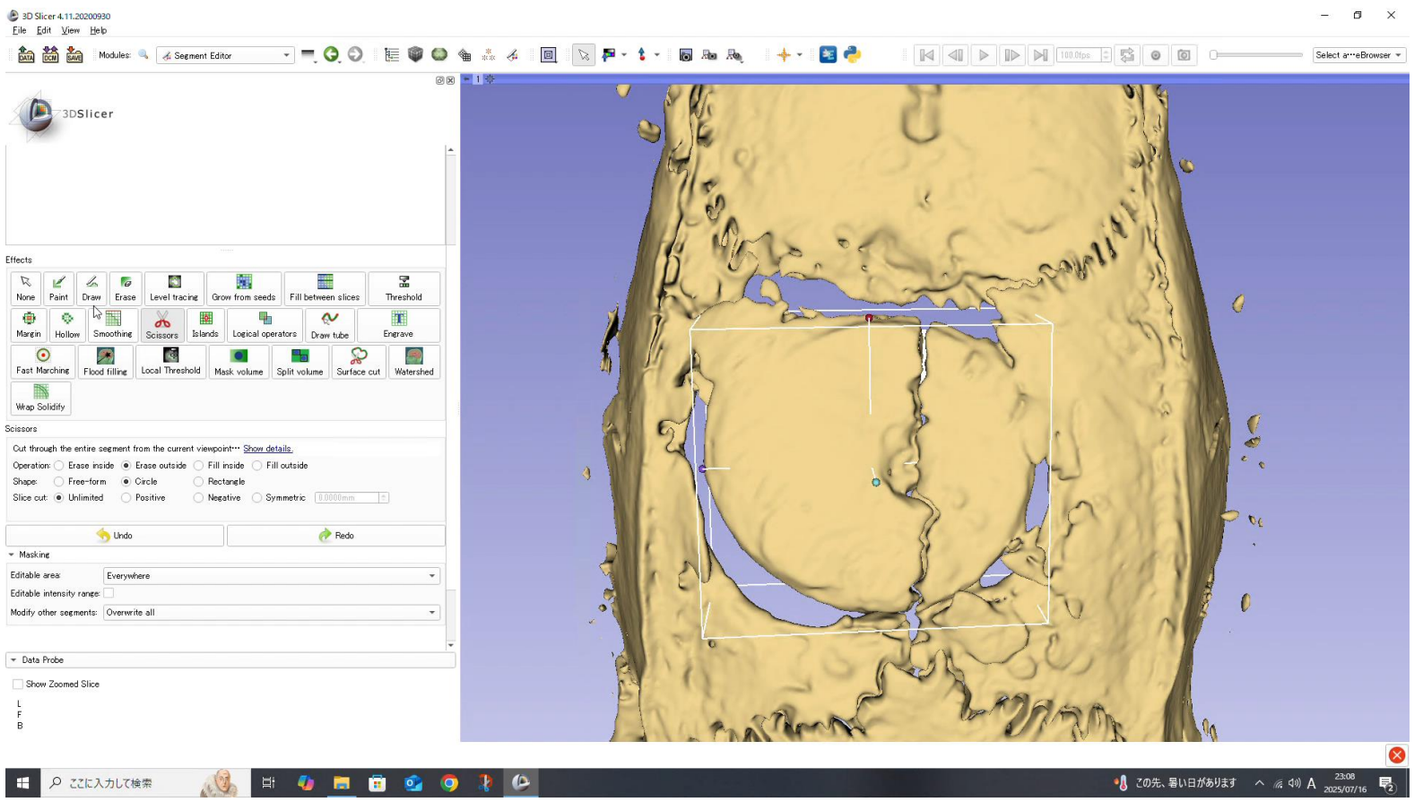
Upon setting the threshold, select 'Apply' to generate the 3D image.

Supplementary Movie. S4 (legend)



To ascertain the return on investment (ROI) of the 3D model, navigate to the Sequence tab, select Crop Volume, and delineate the region of interest (ROI) to correspond with the dimensions of the bone defect and the grafted bone fragment.

Supplementary Movie. S5 (legend)



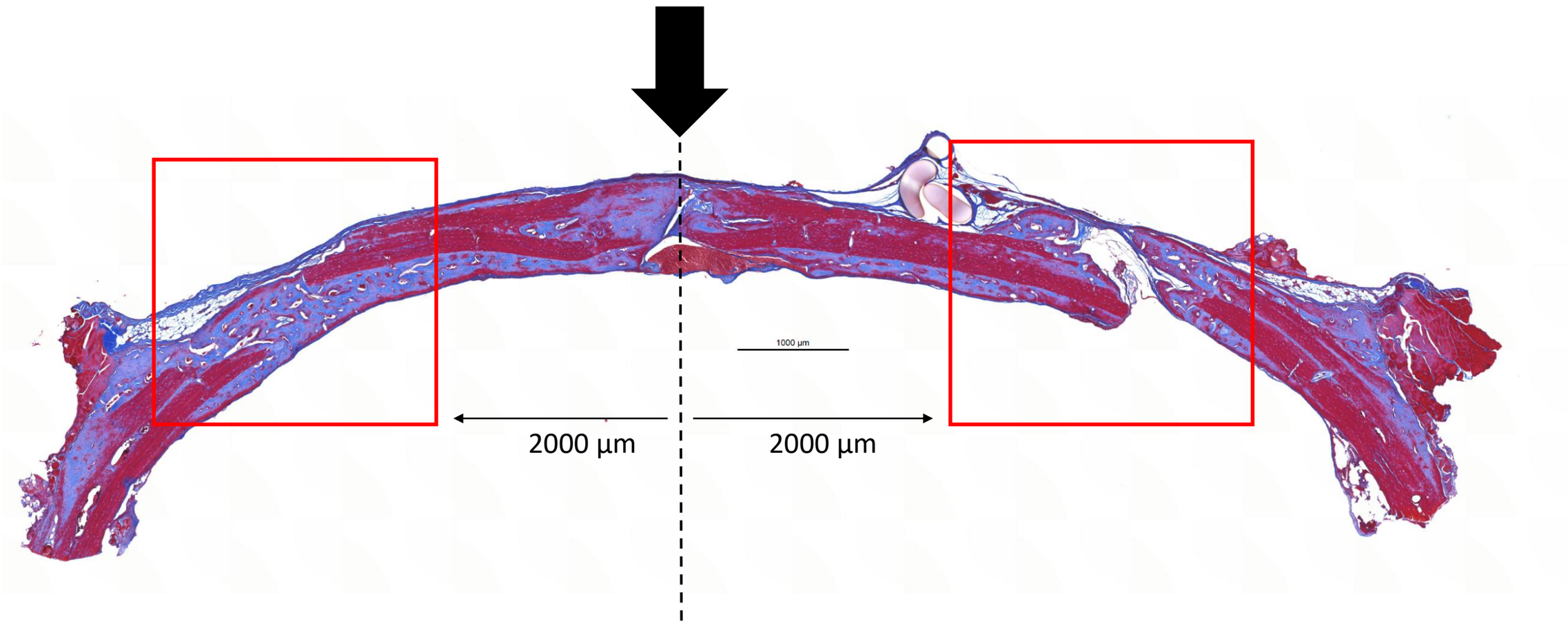
To measure the volume of the bone graft, utilize the determined ROI as a reference to excise extraneous areas of the three-dimensional image using the Scissors tool in the Segmentation Editor.

Subsequently, select Segment Statistics from the Quantification tab on the refined 3D image and click ‘Apply’ to ascertain the volume of the bone graft.

Supplementary Fig. S6

Defining the Region of Interest (ROI) for Histological Analysis (MTC and CD31 Staining)

Step 1:Define the sagittal sinus as the anatomical midline.



Step 2:Place rectangular ROIs (3000 × 3000 µm², shown in red)
2000 µm lateral to the midline on both sides.