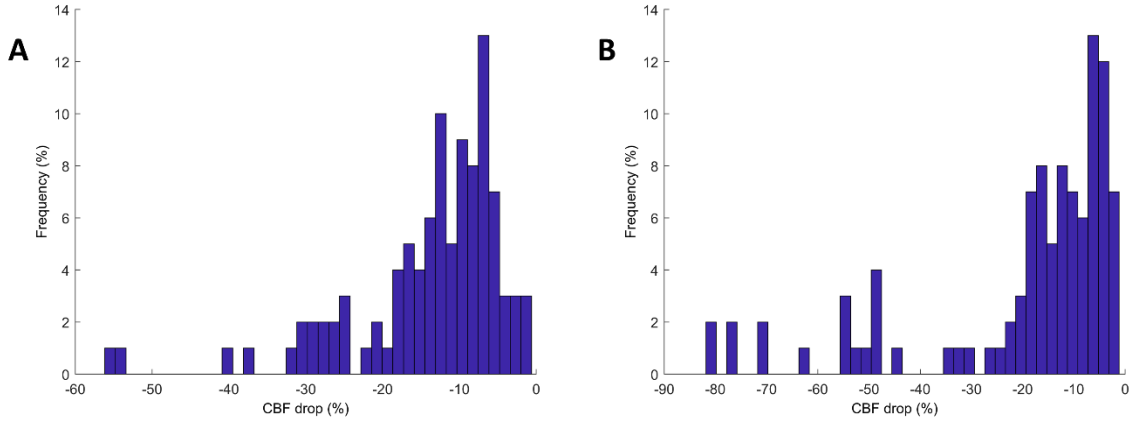
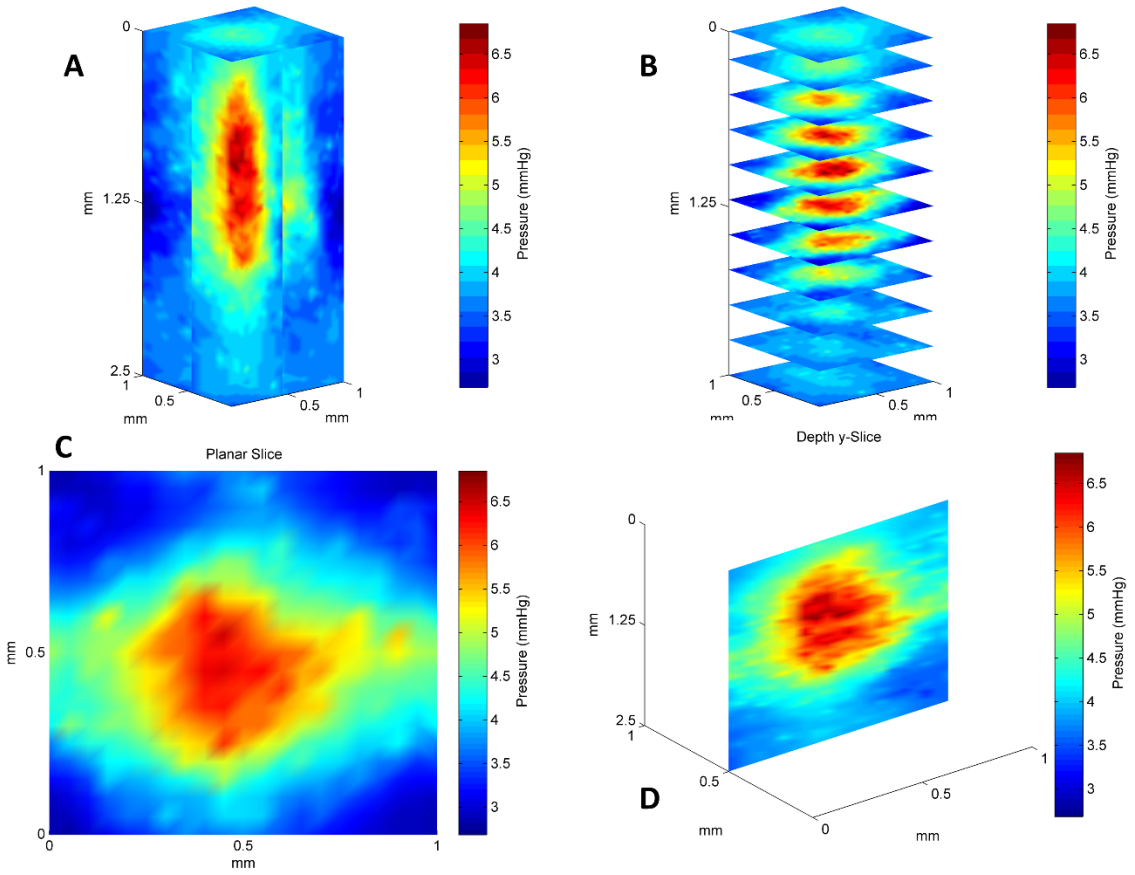
Supplementary Material 1 – Venous occlusions

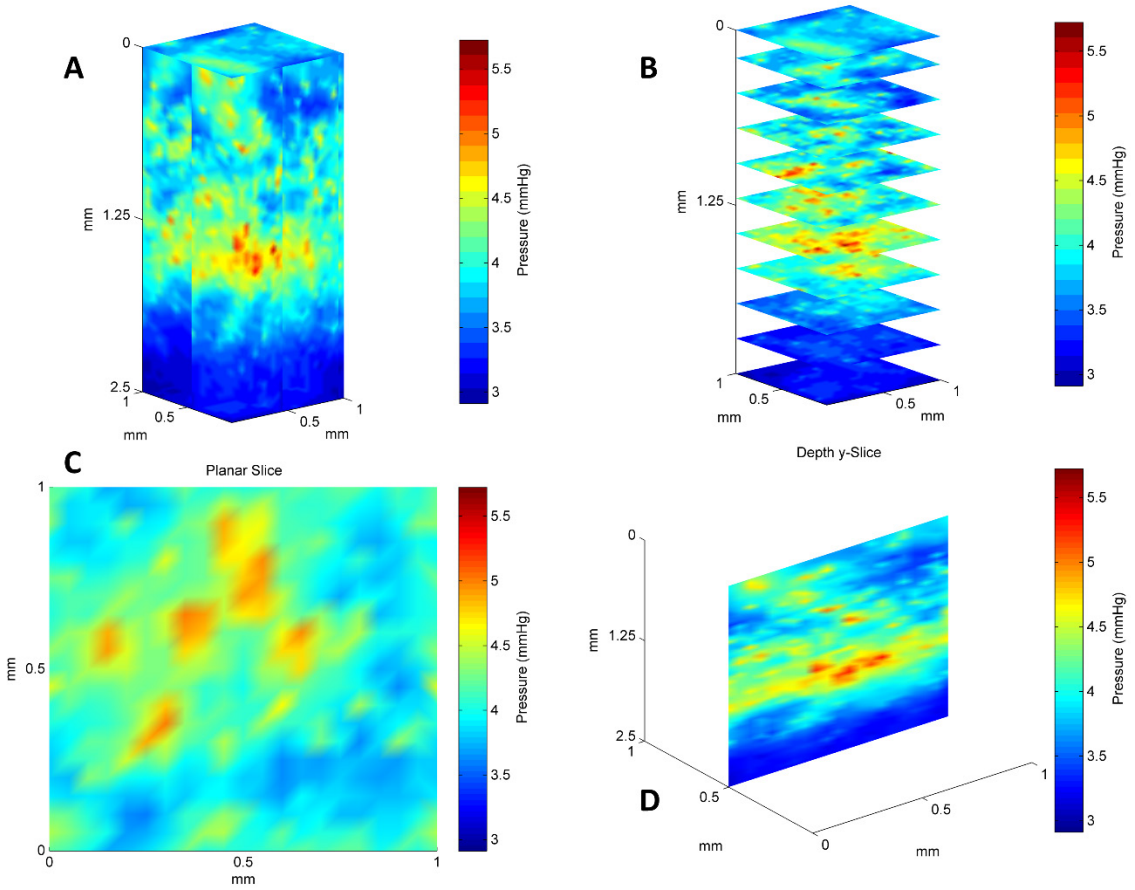
Supplementary material detailing the CBF drops, pressure changes, and flow changes after the occlusion of a penetrating venule (averaged over 100 simulations).



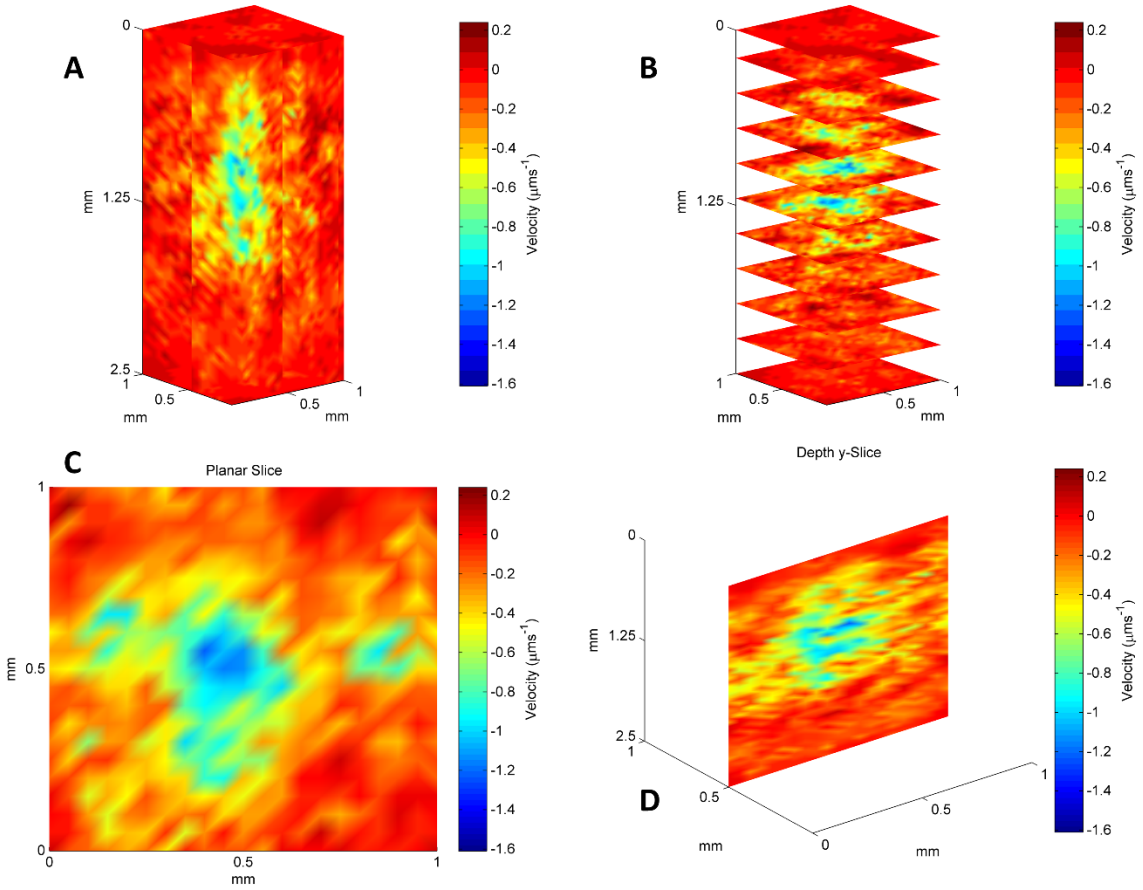
S.1.1 Histogram of the change in CBF post-occlusion of a central venule in every voxel. a) Case 1: 20 – 50 µm vessels; b) Case 2: 40 – 110 µm vessels



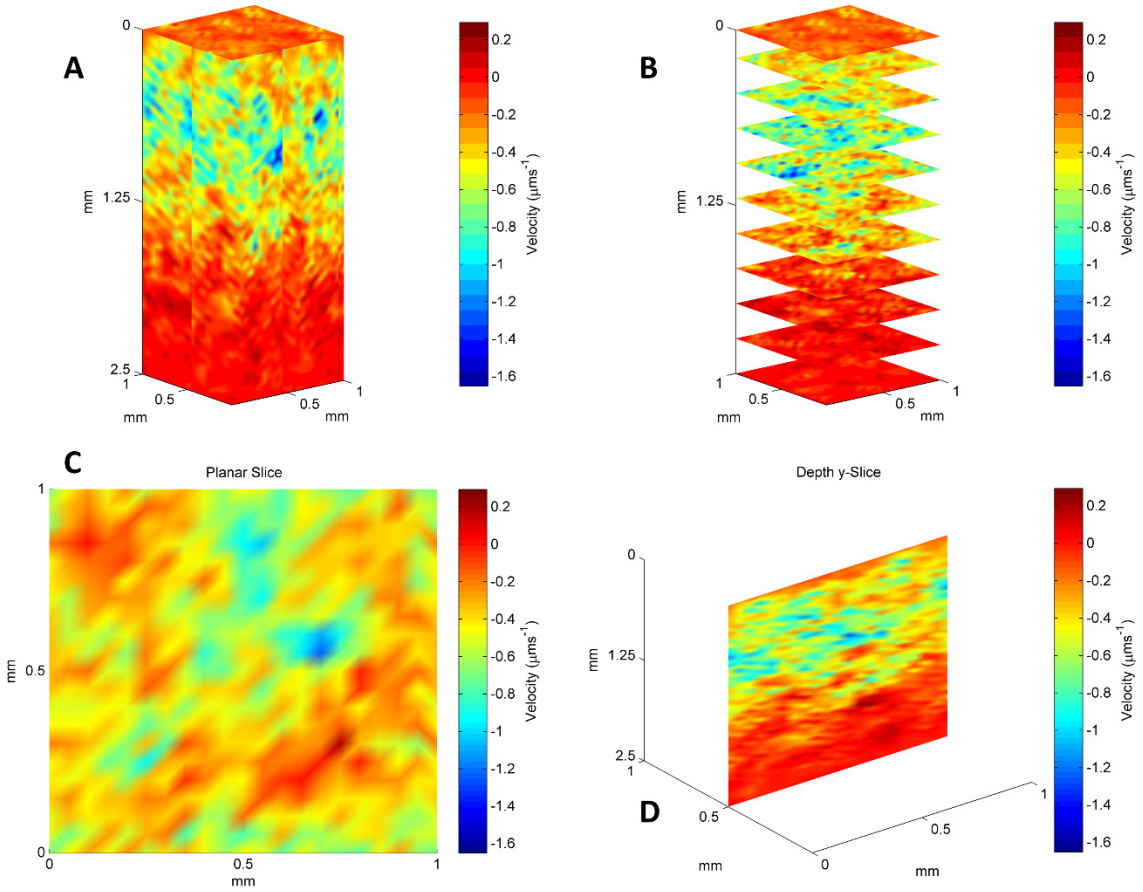
S.1.2 Pressure difference between the averaged healthy and occluded venule vasculature for the Case 1 configuration. a) 3D map of pressure difference displaying a clear central region of blood pressure increase. b) Slices of the pressure map taken at 250 µm intervals through the depth of the voxel, clearly displaying the conical nature of the blood pressure rise. c) Planar slice taken 1.25 mm down the voxel showing a circular region of pressure increase, with a radius of around 300 µm. d) Planar slice taken depth-wise through the voxel 0.5 mm along the width of the voxel, again showing the conical nature of the pressure increase.



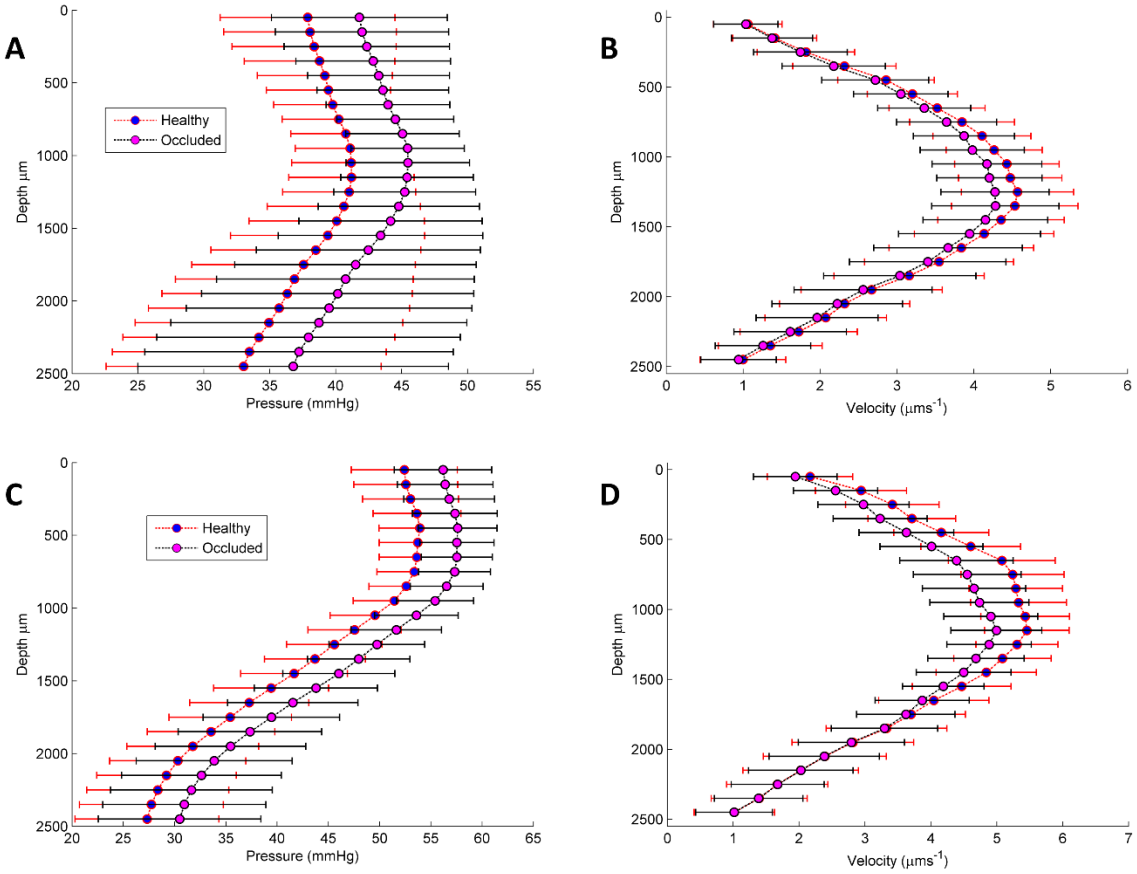
S.1.3 Pressure difference between the averaged healthy and occluded venule vasculature for the Case 2 configuration. a) 3D map of pressure difference displaying a diffuse region of pressure increase. b) Slices of the pressure map taken at 250 µm intervals through the depth of the voxel. c) Planar slice taken 1.25 mm down the voxel showing a diffuse region of pressure increase. d) Planar slice taken depth-wise through the voxel 0.5 mm along the width of the voxel.



S.1.4 Volume averaged velocity difference between the averaged healthy and occluded venule vasculature for the Case 1 configuration. a) 3D map of velocity difference displaying a central region of blood velocity drop. b) Slices of the velocity map taken at 250 µm intervals through the depth of the voxel. c) Planar slice taken 1.25 mm down the voxel. d) A planar slice taken depth-wise through the voxel 0.5 mm along the width of the voxel, showing an expansive region of blood velocity drop.



S.1.5 Volume averaged velocity difference between the averaged healthy and occluded venule vasculature for the Case 2 configuration. a) 3D map of velocity difference displaying a more diffuse region of blood velocity drop. b) Slices of the velocity map taken at 250 µm intervals through the depth of the voxel. c) Planar slice taken 1.25 mm down the voxel. d) A planar slice taken depth-wise through the voxel 0.5 mm along the width of the voxel, showing an expansive region of blood velocity drop across the voxel.



S.1.6 a,b) 1-D planar averaged depth profiles of pressure and total velocity for the case 1 configuration. c,d) 1-D planar averaged depth profiles of pressure and total velocity for the case 2 configuration. Blue solid circles – Healthy vasculature; Magenta solid circles – Occluded venule vasculature.