

Hemodynamic Change in Stent-graft Placement of Abdominal Aortic Aneurysm: Experiment Using Phantom

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Purpose: Stent-graft is widely used for the management abdominal aortic aneurysm (AAA) nowadays. But, to our knowledge, hemodynamic change in aneurysm has not been studied because of difficulty in conducting research in human. We made a phantom of AAA and performed the research of the hemodynamic change.

Materials and Methods: AAA had 5cm length and 5.5cm diameter and had collateral channel which could be open or close. Abdominal aorta had 18mm diameter. Synchronous and continuous monitoring of pressure was made in supra-AAA aorta and AAA and before and after deployment of two stent-grafts (A; 14cm x 24mm, B; 14cm x 20mm). Stent-graft A was located in the center of AAA (showing no type I endoleak on angiography) and then was located upward- or downward- deviated (type I endoleak). Stent-graft B was located in the center of AAA (type I endoleak)

and was ballooned in both ends of stent-graft (no type I endoleak).

Results: Before deployment of stent-graft, there was no difference of pressure in the two points and opening collateral channel did not show any change of pressure. During release of stent-graft, the pressure in AAA was lower than or similar to that before release. Complete release made the pressure in AAA lower than that before release. The development of type I endoleak in stent-graft A increased the pressure in AAA. The ballooning in stent-graft B decreased the pressure in AAA. Opening collateral channel after deployment, migration, or ballooning did not show any change of pressure.

Conclusion: Experiment using phantom makes it possible to show changes of pressure in aorta and AAA before and after deployment of stent-graft.

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