

# Does Suprarenal Fixation with Barbs Prevent Late Graft Migration, and What Is the Effect on Renal Function?

NOTES

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Durable fixation of the stent graft is crucial in endovascular aneurysm repair (EVAR). Late descent of the cranial stent into the sac occurred frequently with some early devices. Several mechanisms are responsible for migration. Bifurcated and tapered stent grafts offer resistance to blood flow and are pushed by the longitudinal force. Curved grafts are affected by lateral vector forces. The systo-diastolic pulsatile motion contributes to migration.

The longitudinal force on abdominal aortic stent grafts is in the range of 10 N. The force is proportional with blood pressure and vessel diameter. It is asymmetrically distributed in an angulated neck. Cadaveric studies suggest that infrarenal fixation is unlikely to withstand the longitudinal force. Biologic healing is weak in humans, which explains why dislodgement may occur late.

The suprarenal aorta is a long and relatively healthy aortic segment for stent graft fixation. A bare top stent carrying barbs that engage the entire suprarenal aortic wall improves mechanical fixation 10-fold. Cross-renal Z-stents with barbs piercing the aortic wall are well tolerated in animal models and do not affect renal perfusion.

Suprarenal Z-stents have been used for a decade. The incidence of stent graft migration is currently 1 to 2%. Significant renal impairment have not been reported. However, the cranial wire loops of the top stent should not be placed at the level of the renal arteries since the loop may injure the ostium of the renal artery. The need for suprarenal stenting is convincingly demonstrated by stent grafts ripped away from a firmly anchored top stent. Therefore, strong attachment between stent graft and top stent is necessary.

## References

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