

Endovascular Repair of Complex Ruptured Abdominal Aortic Aneurysm with Surgeon-Modified Fenestrated Stent Graft

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Abstract

Despite advances in technology, ruptured abdominal aortic aneurysm still carries a high risk of perioperative morbidity and mortality. Although off-the-shelf stent grafts can be used to treat certain ruptured infrarenal and thoracic aortic aneurysms in high-risk patients, complex supra- and para-renal aneurysms require customized fenestrated stent grafts that take a minimum of 6 weeks to be manufactured. This delay can be circumnavigated with surgeon-modified custom fenestrations created in the operating room using an off-the-shelf stent graft. Described herein is a case of a ruptured suprarenal abdominal aortic aneurysm successfully treated endovascularly with surgeon-modified three-vessel fenestrated stent graft.

An 86-year-old male presented to the emergency department with worsening back and groin pain and was found on imaging to have a suprarenal abdominal aortic aneurysm with a contained rupture of the posterolateral wall. He was subsequently taken to the operating room, where a Cook Zenith® stent graft was partially deployed and custom modified using specifications obtained from a three-dimensional reconstruction of the patient's computed tomography angiogram (CTA) to create fenestrations for the superior mesenteric artery (SMA) and right and left renal arteries.

The patient tolerated the procedure well and was kept overnight in the intensive care unit for close observation. His post-operative course remained unremarkable and he was discharged home on post-operative day three.

Surgeon-modified fenestrated stent grafts allow a way to circumvent the high morbidity and mortality associated with open repair of complex ruptured abdominal aortic aneurysms, especially crucial in high-risk patients. Described above is a high-risk patient with a contained rupture of a suprarenal abdominal aortic aneurysm, successfully treated endovascularly with a back table surgeon-modified three-vessel fenestrated stent graft with no perioperative morbidity.

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Endovascular Repair of Complex Ruptured Abdominal Aortic Aneurysm with Surgeon-Modified Fenestrated Stent Graft

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BACKGROUND

Abdominal aortic aneurysm (AAA) is a typically asymptomatic condition, not uncommonly seen in elderly men, and has the potential to be rapidly fatal.

mortality rate of AAA rupture if left untreated: **100%**

perioperative mortality in patients who undergo repair of AAAA: **20-60%**

Complex ruptured abdominal aortic aneurysm (rAAA) may be successfully treated endovascularly if a patient-customized fenestrated stent graft is immediately available for implantation.

- This is possible with back-table surgeon modification of an off-the-shelf stent graft.

#1 risk factor for perioperative mortality is advanced age

Major risk factor for perioperative morbidity and mortality is open repair

CASE DESCRIPTION

86-year-old male presented to the emergency department with worsening back and groin pain. On imaging, was found to have a juxtarenal AAA with contained rupture of the posterolateral wall.

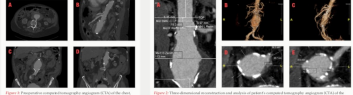



Figure 1: Preoperative computed tomography (CT) scan of the abdomen showing a large, complex, ruptured abdominal aortic aneurysm (AAA) with a contained rupture of the posterolateral wall. The aneurysm is located just above the renal arteries (juxtarenal).

Figure 2: Intraoperative photograph showing the surgical approach to the AAA. The aneurysm is clearly visible, and the rupture site is identified. The surgeon is performing a back-table modification of the stent graft.

METHODS



1. Patient positioning and skin preparation.
2. Incision and exposure of the aorta.
3. Identification of the renal arteries and the aneurysm.
4. Placement of the fenestrated stent graft.
5. Completion of the repair and closure.
6. Postoperative imaging.
7. Patient recovery.
8. Discharge planning.
9. Follow-up.
10. Long-term monitoring.

1: The aneurysm is fully exposed and the rupture site is identified.

2: The fenestrated stent graft is placed over the aneurysm and the rupture site.

3: The rupture site is repaired with a patch.

4: The stent graft is secured with sutures.

5: The aneurysm is covered with a patch.

6: The patient is taken to the operating room for the repair.

7: The aneurysm is exposed and the rupture site is identified.

8: The fenestrated stent graft is placed over the aneurysm and the rupture site.

9: The rupture site is repaired with a patch.

10: The stent graft is secured with sutures.

RESULTS

Patient tolerated the procedure well without complication and was kept overnight in the intensive care unit for close observation.

Postoperative course remained unremarkable.

Discharged home on postoperative day three.

CONCLUSION

Surgeon-modified fenestrated stent grafts circumvent the high morbidity and mortality associated with open repair of complex ruptured AAA, especially crucial in high-risk patients.

Described above is a high-risk patient with contained rupture of a complex juxtarenal AAA, successfully treated with a back-table surgeon-modified three-vessel fenestrated stent graft with no perioperative morbidity.

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ABOUT THE AUTHOR

Ahmed K. Ghamraoui, DO, MS, is a board-certified general surgeon and vascular surgeon. He is currently a resident in the vascular surgery fellowship program at the University of Florida. He is also a member of the American College of Surgeons and the American Society of Vascular Surgeons.

REFERENCES

1. Ghamraoui AK, Ricotta JJ. Endovascular repair of a complex ruptured abdominal aortic aneurysm with a back-table surgeon-modified fenestrated stent graft. *Cureus*. 2018;10(10):e2888.