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Clinical Research

Contemporary Results of Endovascular Repair of Isolated Abdominal Aortic Dissection with Unibody Bifurcated Stent Grafts

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Objectives: To report the midterm safety and efficacy of the Aegis™-B (Microport, Shanghai, China) unibody bifurcated stent graft for endovascular treatment of isolated abdominal aortic dissection (IAAD).

Background: Isolated abdominal aorta dissection (IAAD) is a rare event. Endovascular stent grafts seem to offer an efficient therapeutic approach to treat IAAD. However, the relatively small diameter of the infrarenal aorta and aortic bifurcation remains the main anatomical limitation to endovascular repair.

Methods: Between 2008 and 2015, we retrospectively evaluated 32 IAAD patients (21 men; mean age 58 ± 18 years), who underwent endovascular repair using Aegis™-B unibody bifurcated stent graft. Narrow proximal landing zone and narrow distal aorta was present in 11 (34.4%) patients and 10 (31.3%) patients, respectively. In the follow-up period, aortic remodeling was observed with computed tomography angiography.

Results: All patients were treated by endovascular means, with a primary technical success rate of 100%. During a mean follow-up period of 30.71 ± 16.36 months (range, 8−56 months), no death, rupture, stent fracture, material failure, or device migration was observed. Complete false lumen thrombosis was observed in all patients at 1 year, and all patients were free from false lumen growth in the follow-up.

Conclusions: Endovascular treatment of IAAD using the Aegis™-B system appears to be safe and effective. Results from this study suggest this algorithm can provide stable, secure fixation for IAAD patients with narrow proximal landing zone, and distal aorta.

M.Z. and H.C. contributed to this work equally, shared first authorship.

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INTRODUCTION

Isolated abdominal aorta dissection (IAAD) is a rare event, usually related to spontaneous, traumatic, or iatrogenic causes. The clinical presentation of IAAD may be associated with abdominal pain, visceral ischemia, acute renal failure, and limb ischemia.[1–4] The advent and applicability of endovascular stent grafts for abdominal aorta aneurysms seem to offer an efficient therapeutic approach to treat IAAD. However, the relatively small diameter of the infrarenal aorta and aortic bifurcation remains the main anatomical limitation to endovascular repair.[5] As the experience with endovascular repair has matured, so have device design considerations. Unibody endograft with an endoskeleton and anatomical fixation was adopted to prevent device migration.[6–8] Especially, this approach was widely applied into abdominal aortic aneurysm (AAA) with hostile aortic necks or distal narrow aorta, which was considered as challenging anatomy for endovascular repair.[9]

The aim of this retrospective study was to assess the midterm safety and efficacy of endovascular IAAD repair using the Aegis™-B (Microport, Shanghai, China) unibody bifurcated stent graft.

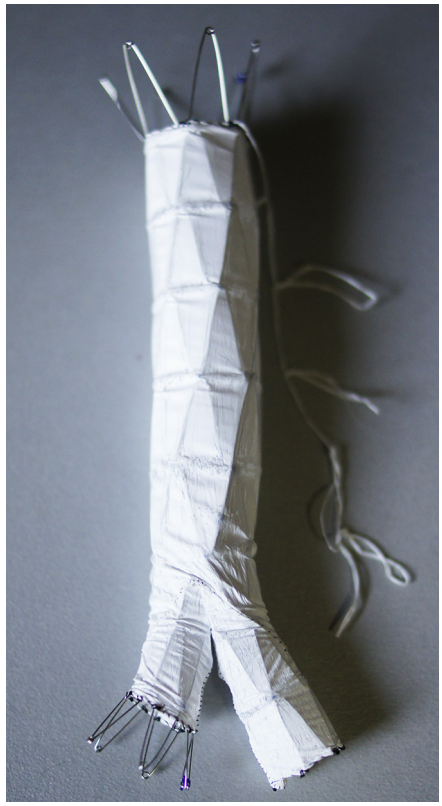

Fig. 1. Microport Aegis unibody bifurcated stent graft.

MATERIALS AND METHODS

Between January 2008 and October 2015, clinical data of 32 IAAD patients (21 men; mean age 58 ± 18 years, range 40–75) undergoing endovascular repair using Aegis™-B unibody bifurcated stent grafts (Microport, Shanghai, China, Fig. 1) were analyzed retrospectively. This study has been approved by the ethics committee of Nanjing Drum Tower Hospital, Medical School of Nanjing University. Each patient who was enrolled in this study has signed the informed consent.

In this IAAD study (Table I), the lesion was located at the level of the abdominal aorta without retrograde extension to the thoracic aorta (Fig. 2). Mean dissection length was 66 ± 28 mm (range 23–98). The mean distance between the proximal entry tear of the dissection and the lowest renal artery or the aortic bifurcation was 56 ± 28 mm and 41 ± 22 mm, respectively, and the maximal diameter of the aorta was 37 ± 8.6 mm. In 11 (34.4%) patients, the lesion retrograde extended to the renal arterial level, and 10 (31.3%) lesions involved the iliac arteries. In the remaining 11 (34.4%), the lesions were only detected between the renal arteries and the aortic bifurcation. The mean true lumen area at proximal landing zone and aortoiliac bifurcation was 3.8 ± 1.0 cm^2 and 2.9 ± 0.9 cm^2, respectively. The mean maximal abdominal aorta area was 6.3 ± 1.1 cm^2, the mean minimal true lumen area was 1.5 ± 0.8 cm^2, and the mean maximal false lumen area was 4.7 ± 1.4 cm^2.

The majority of IAAD occurred spontaneously ($n = 29$), while 3 dissections had an iatrogenic etiology (previous cardiac or hybrid interventions). Indications for operative interventions included signs of aortic rupture, limb ischemia, unremitting pain, and increase in aortic diameter >5 mm in 6 months.[2,10,11] Twenty-four patients suffered from acute ($n = 16$) or subacute ($n = 8$) lesions accompanied by abdominal pain ($n = 17$) or acute limb ischemia caused by flow restriction by the flap ($n = 7$). The other 8 patients had asymptomatic chronic dissections with an increase in aortic diameter >5 mm in 6 months based on computed tomographic angiography (CTA). All patients with acute symptoms underwent analgesic therapy and medical management of systolic blood pressure (target < 120 mm Hg) at first.

Implantation Procedures

One common femoral artery (CFA) was exposed for delivery access, and an 8-F sheath was inserted