An Anatomic Description of Aortoiliac Morphology And Implications For Treatment

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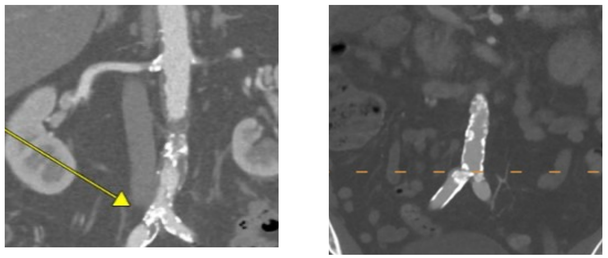
Background

- Endovascular management of aortoiliac occlusive disease (AIOD) has evolved significantly over the past decade, providing durable treatment options for patients in the face of increasingly complex disease.
- As the field advances, it is of paramount importance to understand the anatomy of disease distribution and variety of stenting techniques.
- Here, we describe our 7-year experience with endovascular stenting of aortoiliac lesions and provide a detailed anatomic analysis of our patient population.

Methods

- Our institution's Vascular Quality Initiative (VQI) database was queried for patients undergoing endovascular stenting of at least one of the aortoiliac vessels for the treatment of intermittent claudication or critical limb ischemia (figures 1 and 2).
- Pre/post-operative patient clinical and imaging data were obtained from the VQI and our EMR.
- TeraRecon was used for center-line reconstruction and measurements. All statistical analyses were performed with STATA18.5

Figure 1



Coronal views from CT scans of two patients with complex AIOD included in the analysis

Table 1: Anatomic Measurements

Table 1. Baseline Characteristics

Characteristics	Kissing Stents or AFX (n=19)	Unilateral Stent (n=36)	All Patients (n=55)	P-Value*
Infrarenal Aorta				
Diameter	16.4 (2.6)	17.4 (4.5)	17.0 (3.9)	0.38
Length	91.2 (10.9)	92.3 (13.8)	92. (12.9)	0.77
Distal Aortic Diameter	14.3 (3)	16.3 (4)	15.6 (3.7)	**0.03**
Diameter at Bifurcation	19.1 (4.9)	20.7 (7.6)	20.1 (6.8)	0.21
Right Common Iliac Artery				
Diameter	9.2 (2.0)	9.9 (2.4)	9.7 (2.3)	0.12
Length	53.9 (13.7)	59.0 (15.1)	57.4 (14.0)	0.12
Left Common Iliac Artery				
Diameter	9.2 (2.0)	9.8 (2.7)	9.6 (2.5)	0.20
Length	55.3 (13.4)	61.0 (13.4)	59.2 (13.6)	0.07
Aortic Bifurcation Angle	55.2 (11.1)	52.3 (13.9)	53.3 (13.0)	0.77
IMA Distance from Bifurcation	34.0 (11.5)	38.5 (9.6)	37.0 (10.4)	0.08
Hypogastric Occlusion				
Left	26.3% (5)	19.4% (7)	21.8% (12)	0.42
Right	15.8% (3)	8.3% (3)	11.1% (4)	0.46
Tortuosity Index				
Right Common Iliac	1.06 (0.04)	1.08 (0.08)	1.07 (0.06)	0.14
Left Common Iliac	1.07 (0.05)	1.1 (0.12)	1.09 (0.09)	0.10

Results

- **Study size & Follow-up:** 55 patients; mean follow-up was 663 days
- **Population & Indications:** The mean age was 68.4 ± 8.5 years, 69.1% were male and 27.3% were treated for CLI while 72.7% were claudicants.
- **Treatment Approach:** 19 were treated with kissing stenting or AFX (KS-AFX) and 36 with unilateral stenting (US). 3 patients were treated with AFX and 5 of the kissing stent patients were treated based on contralateral common iliac artery protection.
- **Distal Aortic Disease:** When compared (KS-AFX vs US), KS-AFX distal aortic diameter was smaller (14.3 ± 3 mm vs 16.3 ± 4, P = 0.03, Table 1) and aortic stenosis was more likely to be present (36.8% vs 8.3%, P = 0.02).
- **Patient Outcomes:** There was no difference in target lesion revascularization, symptomatic recurrence or change in ABI among the groups regardless of native patient anatomy or stent technique utilized.

Conclusions

AIOD patients have diverse anatomic features necessitating a broad repertoire of endovascular approaches that, when selected judiciously, result in durable patient outcomes. The decision of unilateral stenting vs reconstruction of the bifurcation with AFX or kissing stenting in AIOD is common and in our cohort, we saw high rates of clinical success with reconstruction of the bifurcation in patients with distal aortic disease.