Methods: Digital computed tomography angiography was analyzed in 520 consecutive patients treated by open or fenestrated endovascular repair for complex abdominal aortic aneurysms (AAAs, 2000-2012). RA/ARA anatomy was assessed using diameter, length, angles, and kidney perfusion based on analysis of volumetric kidney parenchyma (VKP, Fig). Endovascular suitability was determined by RA diameter ≥4 mm, length to RA bifurcation ≥13 mm, and preservation of >60% of one or >75% of both kidneys by VKP analysis.

Results: There were 222 juxtarenal (43%), 241 suprarenal (46%), and 57 type IV thoracoabdominal aortic aneurysms (11%). A total of 1009 RAs and 176 ARAs were analyzed. Endovascular incorporation was possible in 884 RAs (88%) and in 30 ARAs (17%). Using the proposed criteria, 97 patients (19%) had one or more factors rendering RA incorporation unsuitable, including early bifurcation in 45 (9%), small diameter in 29 (6%), or inability to preserve kidney parenchyma in 28 (5%). A total of 170 patients (33%) had other anatomic issues that would increase technical difficulty to RA incorporation, including excessive downward angulation in 125 (24%), high-grade stenosis in 51 (10%), or prior renal stents in 11 (2%).

Conclusions: Independent of the endovascular technique selected to treat a complex AAA, one of five patients (19%) is not a candidate and one-third have anatomic challenges (33%) for RA incorporation. Patients with unsuitable RA anatomy may need open repair to maximize renal artery patency and preserve renal function.

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VESS13.

Natural History of Renal Artery Aneurysms: An 18-Year Single-Institution Experience
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Objectives: The natural history of renal artery aneurysms (RAAs) is not well documented. We present an 18-year experience of patients with untreated RAAs.

Methods: A retrospective review was performed for patients with RAAs (1995 to 2013). Patients who were observed and had at least two studies (computed tomography/magnetic resonance imaging) were included. Significant aneurysm growth was defined as >3 mm.

Results: Seventy-one aneurysms were analyzed. Mean age on presentation was 69.7 ± 12.3 years, and 62.4% were female. Mean initial diameter was 1.29 ± 0.54 cm (range, 0.5-3.7 cm). There was a mean of 2.8 studies per patient; mean follow-up was 33.2 ± 32.4 months. Detailed clinical information was available in 48 patients. The most common comorbidities were hypertension (79%), hyperlipidemia (50%), and a smoking history (48%); 16.7% had renal insufficiency, and 17% had other arterial aneurysms. Among the cohort, the mean annual growth rate was 0.077 ± 0.023 cm. Only four of 71 (5.6%) grew >3 mm during the study period. By survival analysis, gender was not a risk factor for growth (P = .08). Only smoking was found to be a significant risk factor for growth; current smokers were significantly more likely to have growth >3 mm than former smokers or nonsmokers (50% incidence of growth among current smokers vs 8.3% and 0% respectively; P < .02). Survival analysis demonstrated that larger aneurysms (>1.5 cm at presentation) had significantly less freedom from growth than smaller aneurysms (P = .009). There were no known ruptures, and no patient required RAA intervention.

Conclusions: Small RAAs exhibit a slow annual growth rate. Active smokers and those with a >1.5 cm diameter on presentation may have more rapid growth. In particular, current smokers have a high incidence (30%) of clinically meaningful aneurysm growth. Nevertheless, this relatively large and longer-term natural history study of observed RAAs supports observation for most small RAAs in patients who do not have a clear indication for surgical repair.

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VESS14.

Aggressive Costoclavicular Junction Decompression in Patients With Threatened AV Access
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Objectives: A substantial number of patients with threatened arteriovenous (AV) access are found to have stenoses at the costoclavicular junction (CCJ), which frequently are resistant to angioplasty and stenting. We hypothesized that stenoses in this location will not resolve unless bony decompression is performed to relieve the extrinsic venous compression.

Methods: We reviewed a prospectively maintained database to identify all patients with threatened AV access operated on for stenoses at the CCJ.

Results: Between July 2012 in December 2013, 24 patients with threatened access were operated on for CCJ stenoses at our institution. Fifteen had highly dysfunctional AV fistulas otherwise felt to need ligation, 10 had significant arm and or head swelling, and three required access but had no contralateral options. In six patients, the