Outcomes of Endovascular Management of High-flow Pelvic Arteriovenous Malformations

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Objectives: Pelvic arteriovenous malformations (AVMs) are rare, complex clinical entities that often require a multifaceted approach to treatment. Surgical ligation of proximal feeding vessels has historically been shown to result in recurrence, and thus endovascular embolization is now the mainstay of treatment. The purpose of this study was to review the outcomes of a large series of patients with pelvic AVMs managed using a variety of endovascular techniques.

Methods: We retrospectively reviewed all patients with high-flow pelvic AVMs treated at our institution from January 2005 to December 2015. Patient-related data were collected with regard to patient demographics, comorbidities, and presenting symptoms. Procedural and anatomic information, including embolization agent and vessel(s) treated, was collected, as well as follow-up data regarding number of treatments required and resolution of symptoms.

Results: A total of 30 patients, 17 female (56.6%), with a mean age of 52.1 years (range, 28-89 years), underwent treatment for pelvic AVMs at our institution. Presenting symptoms included pelvic pain and discomfort in 25 patients (83.3%), bleeding in 8 (26.7%), high output cardiac failure in 7 (23.3%), mass effect in 5 (16.7%), and hematuria in 3 (10%). A total of 121 procedures were performed, with a mean of four procedures per patient (range, 1-13 procedures). Multiple procedures were performed in 23 patients (76.7%), 10 (33.3%) of which were planned as staged embolizations. The most common vessels involved were branches of the hypogastric artery in 27 patients (90.8%). Other vessels included inferior mesenteric artery branches in 6 patients (30%), median sacral artery in 3 (10%), and gonadal artery in 2 (6.7%). Multiple arteries were involved in 11 patients (36.7%). The embolic agent was n-butylcyanoacrylate (nBCA) was used in 95.4% of procedures. Other agents included ethyl alcohol in 4.6%, arterial coiling in 14.9%, venous coiling in 11.5%, Amplatzer plug in 9.2%, and microspheres in 4.1% of procedures. Multiple embolic agents were used for 24 (80%) of the patients treated. Improvement or complete resolution of symptoms by the end of their treatment sessions was reported in 27 patients(90%), at a mean follow-up of 34.5 months (range, 1 month-10 years).

Conclusions: Pelvic AVMs are complex anatomic and clinical entities that often require multiple treatment sessions with various treatment modalities to successfully treat. Despite this, endovascular management of these patients has shown good results in most cases in the long-term.

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