

**Introduction:**

- Patients >40 years of age with BPH who do not respond to medical treatment or cannot undergo surgery should be considered for prostatic artery embolization (PAE). Indications and contraindications for PAE are shown in Table 1. Work up items are seen in Table 1.
- PAE has been shown to be safe and effective to treat both components of benign prostatic hyperplasia<sup>1-3</sup>:
  - Static component: PAE → ischemia → apoptosis/necrosis of prostate → prostatic volume reduction
  - Dynamic component: PAE → ischemia → apoptosis/necrosis of prostate → ↓ α1-adrenergic receptors → ↓ neuromuscular tone

**Table 1: Indications, Contraindications, Work Up**

Work up	HPI (prostate symptoms, sexual health, current prostate meds), I-PSS, UA, PSA, PVR, DRE, uroflowmetry, imaging (TRUS, MRI, or CTA)
Candidacy	I-PSS ≥13, failed medical therapy for at ≥3 months, uroflow <10 mL/sec, PVR >100 mL, prostate size >50 g. median lobe <3 cm
Contraindications	Active UTI or prostatitis, prostate or bladder cancer, chronic renal failure, bladder dysfunction, bladder stones, excessive vessel tortuosity or severe atherosclerosis, I-PSS ≤12, high PVR, asymptomatic patient, prostate <50g, medial lobe >3 cm

UA = urinalysis, PSA = prostate specific antigen, PVR = post void residual, DRE = digital rectal exam, TRUS = transrectal ultrasound, MRI = magnetic resonance imaging, CTA = computed tomography angiography

**Table 2: Anatomical Variations of the Prostate Artery<sup>4</sup>**

Classification	Incidence of Variant	Description
Type I	28.7%	IVA originates from anterior division of IIA with a common trunk with SVA
Type II	14.7%	IVA originates from anterior division of IIA and inferior to SVA
Type III	18.9%	IVA originates from obturator artery
Type IV	31.1%	IVA originates from IPA
Type V	5.6%	Less common origins

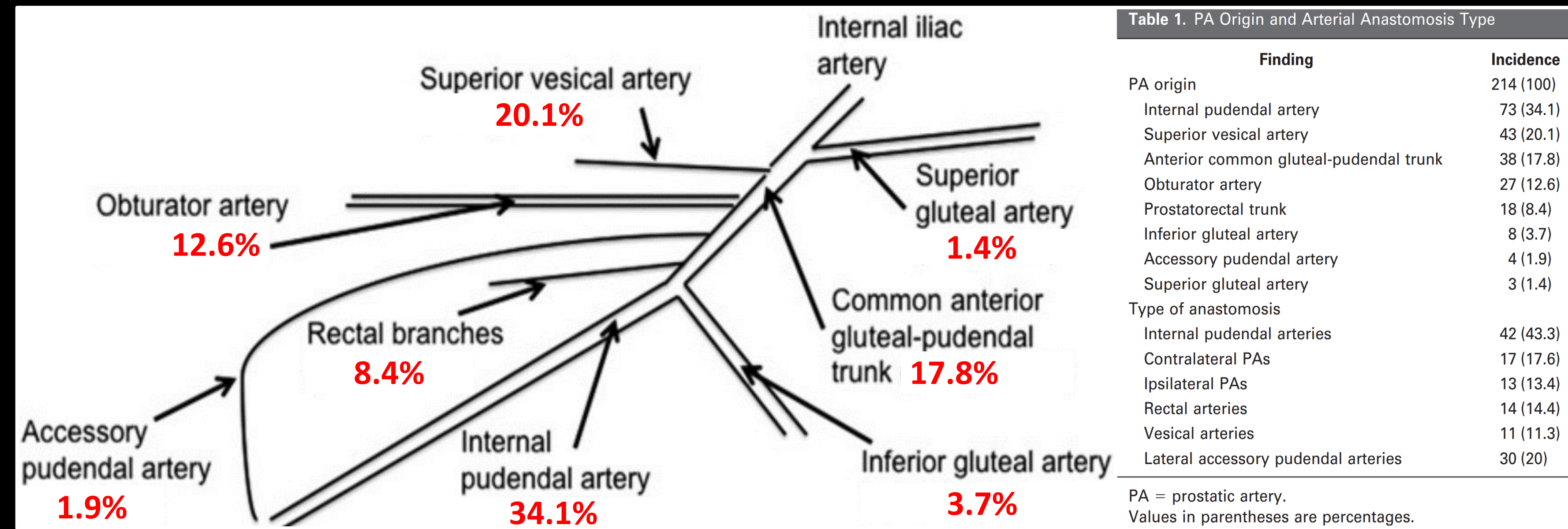
IVA = inferior vesical artery, SVA = superior vesical artery, IIA = internal iliac artery

**Pre-, Peri-, and Post-procedural Care**

- **Pre-procedure:** two Dulcolax for two nights prior to procedure to prevent constipation, insert Foley catheter
- **Periprocedure:** one-time dose of intravenous ciprofloxacin/levofloxacin, nitroglycerin immediately after catheterization of prostatic artery and before injecting embolic, conscious sedation (versed and fentanyl), and anticoagulation (intravenous heparin)
- **Post-procedure**
  - Remove foley
  - Medications: ibuprofen 800mg TID x 7 days, ciprofloxacin 500mg BID x 7 days, Pyridium 100-200mg TID, Vesicare 5mg daily, Dulcolax 20mg OD
  - Intravenous fluids, restrict physical activity x 2-3 days, and follow-up (4-6 weeks s/p PAE)

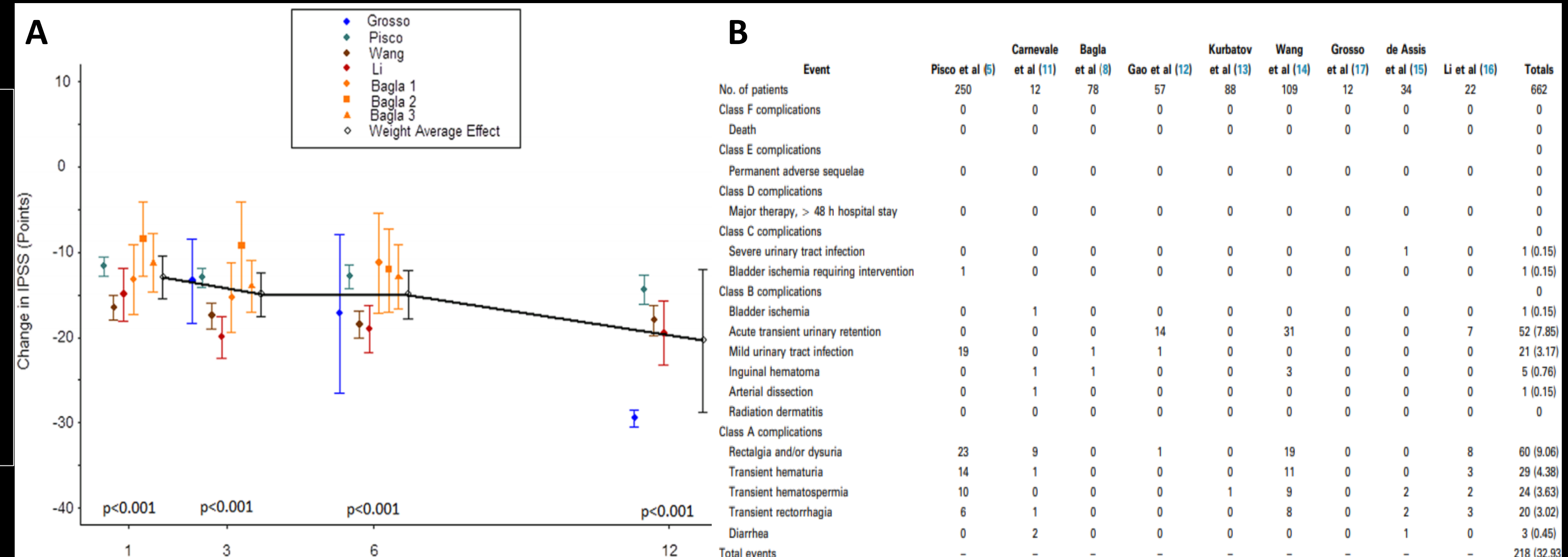
**Technique**

- 1) Radial access with tumescent anesthesia (100mcg nitroglycerine, 9mL 1% lidocaine)
  - Recommend anti-spasmodic radial cocktail (e.g. 200mcg nitroglycerine, 2000 IU heparin, 2.5mg verapamil)
- 2) Hypogastric angiogram: identify prostatic artery and origin,
- 3) Catheterization of prostatic artery: materials include ≤2.4F shapable tip wire 0.014 inch
- 4) Selective injection of prostatic artery
- 5) Cone beam protocols
- 6) Embolization of prostatic artery: slow injection, identify potential non-targets, and embolize with coils if necessary
- 7) Hemostasis



**Figure 1: Prostatic Origin and Arterial Anastomosis<sup>5</sup>**

**Figure 2: Meta-Analysis of Improvements of I-PSS (A)<sup>6</sup> and Table of Adverse Events (B)<sup>6</sup>**



**Figure 3: International Prostate Symptom Score (I-PSS)<sup>7</sup>**

In the past month	Not at all	Less than 1 in 5 times	Less than half the time	About half the time	More than half the time	Almost always	Patient Score
Incomplete Emptying	0	1	2	3	4	5	
Frequency	0	1	2	3	4	5	
Intermittency	0	1	2	3	4	5	
Urgency	0	1	2	3	4	5	
Weak Stream	0	1	2	3	4	5	
Straining	0	1	2	3	4	5	
Nocturia	None	1 Time	2 Times	3 Times	4 Times	5 Times	
<b>Total I-PSS Score</b>							
<b>Scoring</b>	1-7: Mild			8-19: Moderate		20-35: Severe	

**References**

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- 5) Bilhim T, Pisco JM, Rio Tinto H, et al. Prostatic arterial supply: anatomic and imaging findings relevant for selective arterial embolization. *J Vasc Interv Radiol*. 2012;23(11):1403-1415. doi:10.1016/j.jvir.2012.07.028
- 6) Uflacker A, Haskal ZJ, Bilhim T, Patrie J, Huber T, Pisco JM. Meta-Analysis of Prostatic Artery Embolization for Benign Prostatic Hyperplasia. *J Vasc Interv Radiol*. 2016;27(11):1686-1697.e8. doi:10.1016/j.jvir.2016.08.004
- 7) Barry MJ, Fowler FJ Jr, O'Leary MP, Bruskewitz RC, Holtgrewe HL, Mebust WK, Cockett AT. The American Urological Association symptom index for benign prostatic hyperplasia. The Measurement Committee of the American Urological Association. *J Urol*. 1992; 148(5):1549-57; discussion 1564.