

IVUS-Guided Contrast-Free BPA for CTEPH with Severe Iodinated Contrast Allergy

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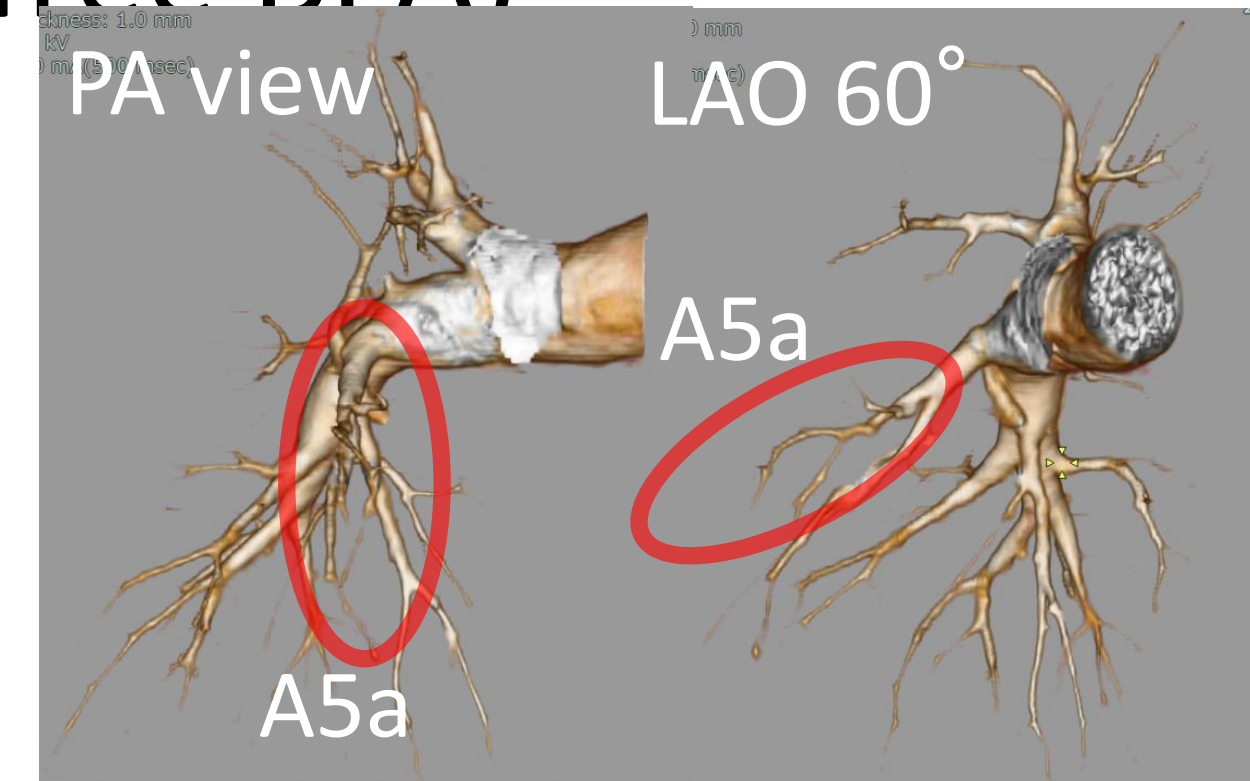


Introduction

- PEA is the gold standard, but some patients have inoperable peripheral lesions or residual PH.
- BPA is an established treatment for patients with inoperable or residual lesions in CTEPH.
- BPA typically requires repeated pulmonary angiography using iodinated contrast media.
- In patients with severe contrast allergy, interventional treatment options are limited.
- We evaluated the feasibility and clinical outcomes of IVUS-guided contrast-free BPA.

Methods (Procedure for contrast-free BPA)

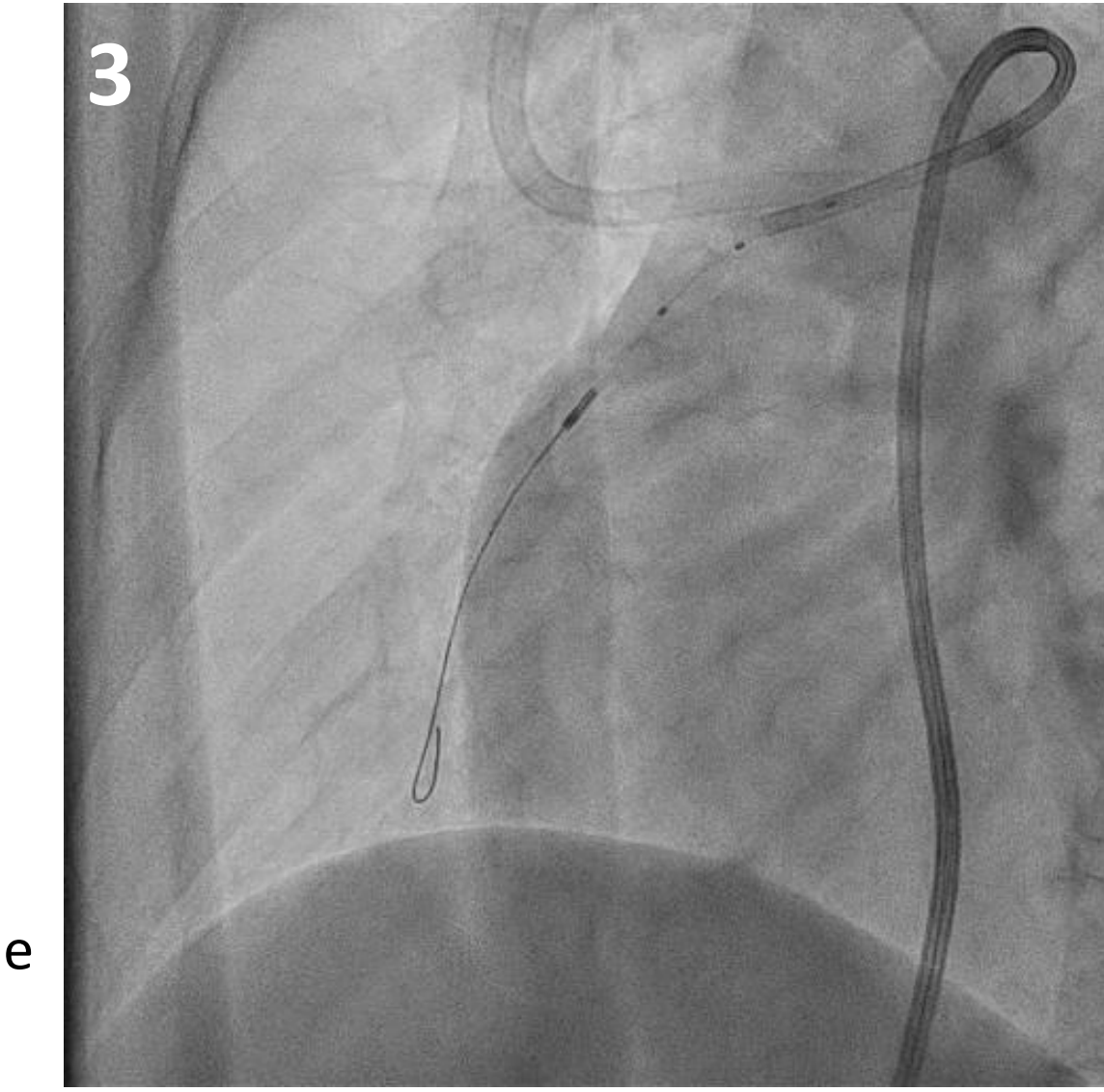
1. A three-dimensional reconstruction of the pulmonary arteries was generated from previously acquired imaging data and used to identify target lesions in conjunction with fluoroscopic anatomical landmarks.



2. Using a standard BPA system, the guiding catheter is advanced into the target pulmonary arterial branch.

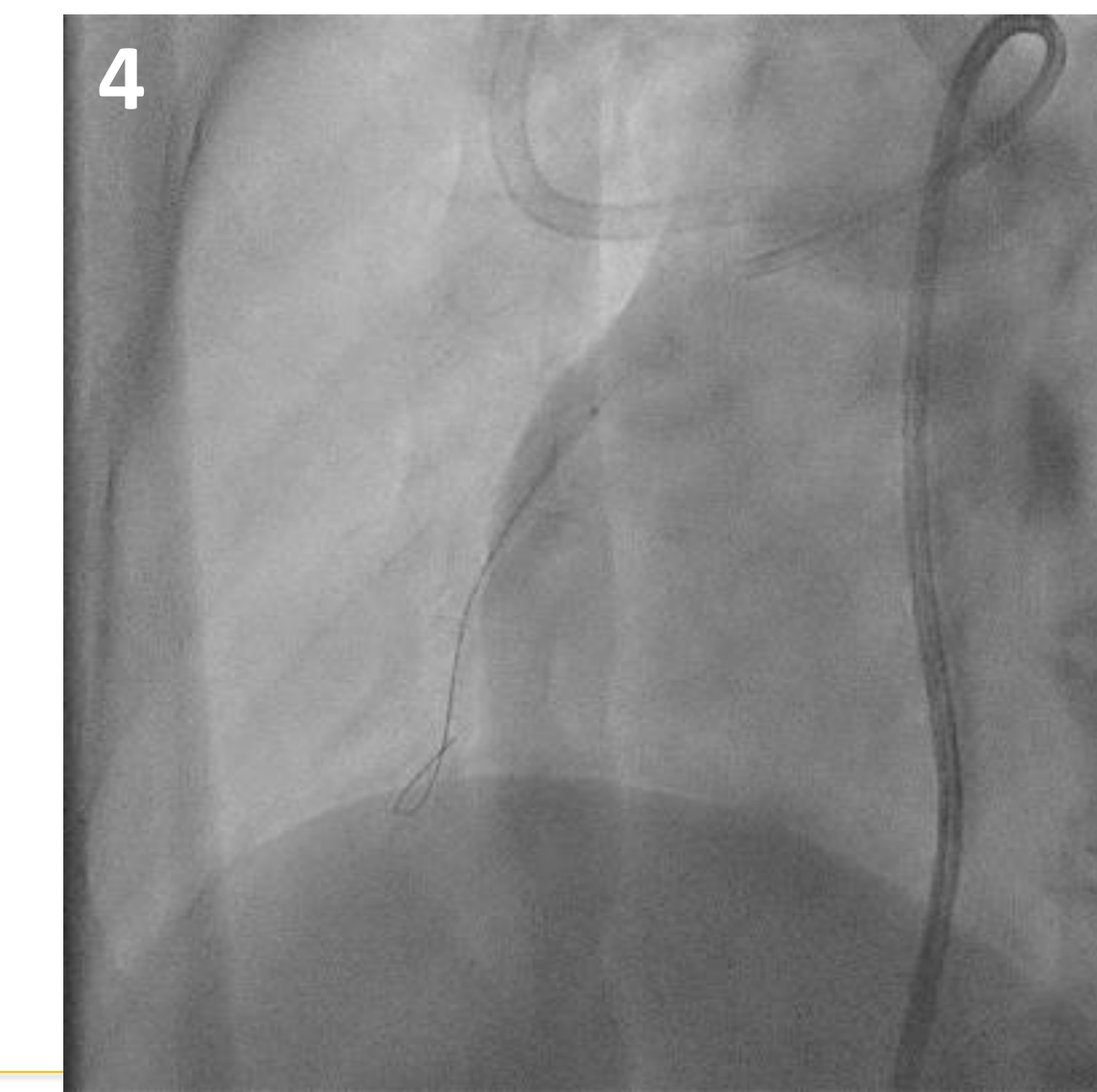
Methods (Procedure for contrast-free BPA)

3. After guidewire crossing, IVUS is advanced over the guidewire. The point where the IVUS catheter encounters resistance is marked.



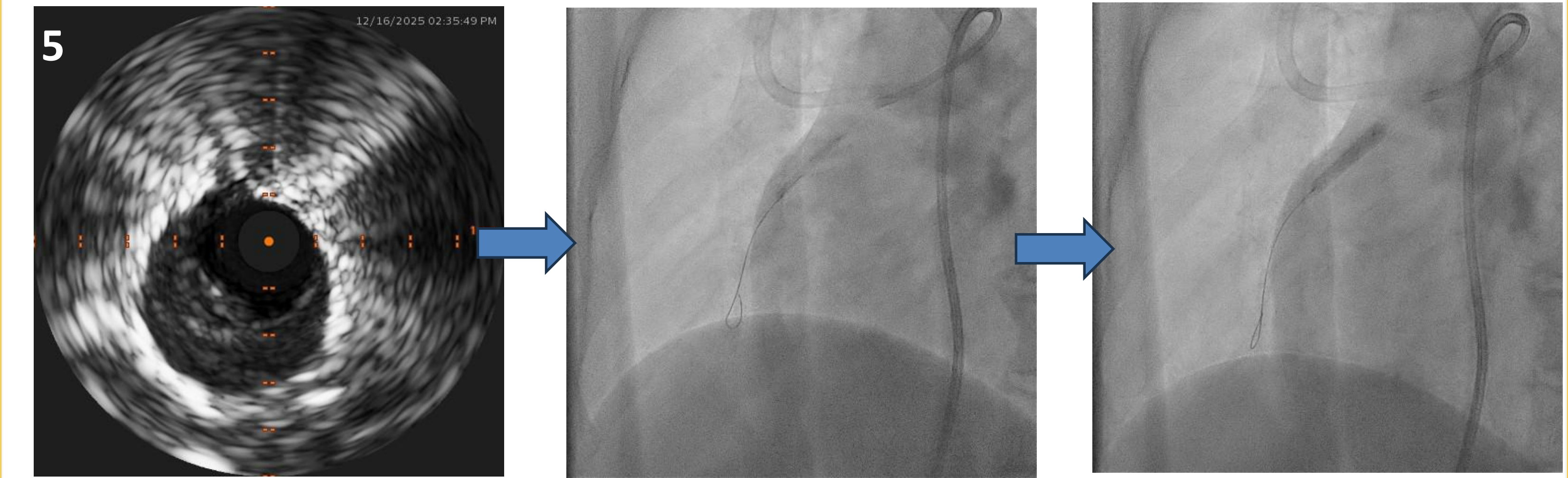
* All BPA images in this presentation show treatment of the right A5a lesion.

4. Low-pressure dilation is performed using a 2-mm balloon.



Methods (Procedure for contrast-free BPA)

5. IVUS is repeated to reassess the vascular morphology, and additional balloon dilation with an appropriately upsized balloon is performed if necessary.



6. After balloon dilation, the vessel is observed for several minutes to confirm the absence of complications.

7. These steps are repeated for other target lesions.

Case example 1, Woman in her late 40s

History

- DVT/PE diagnosed 1 year earlier

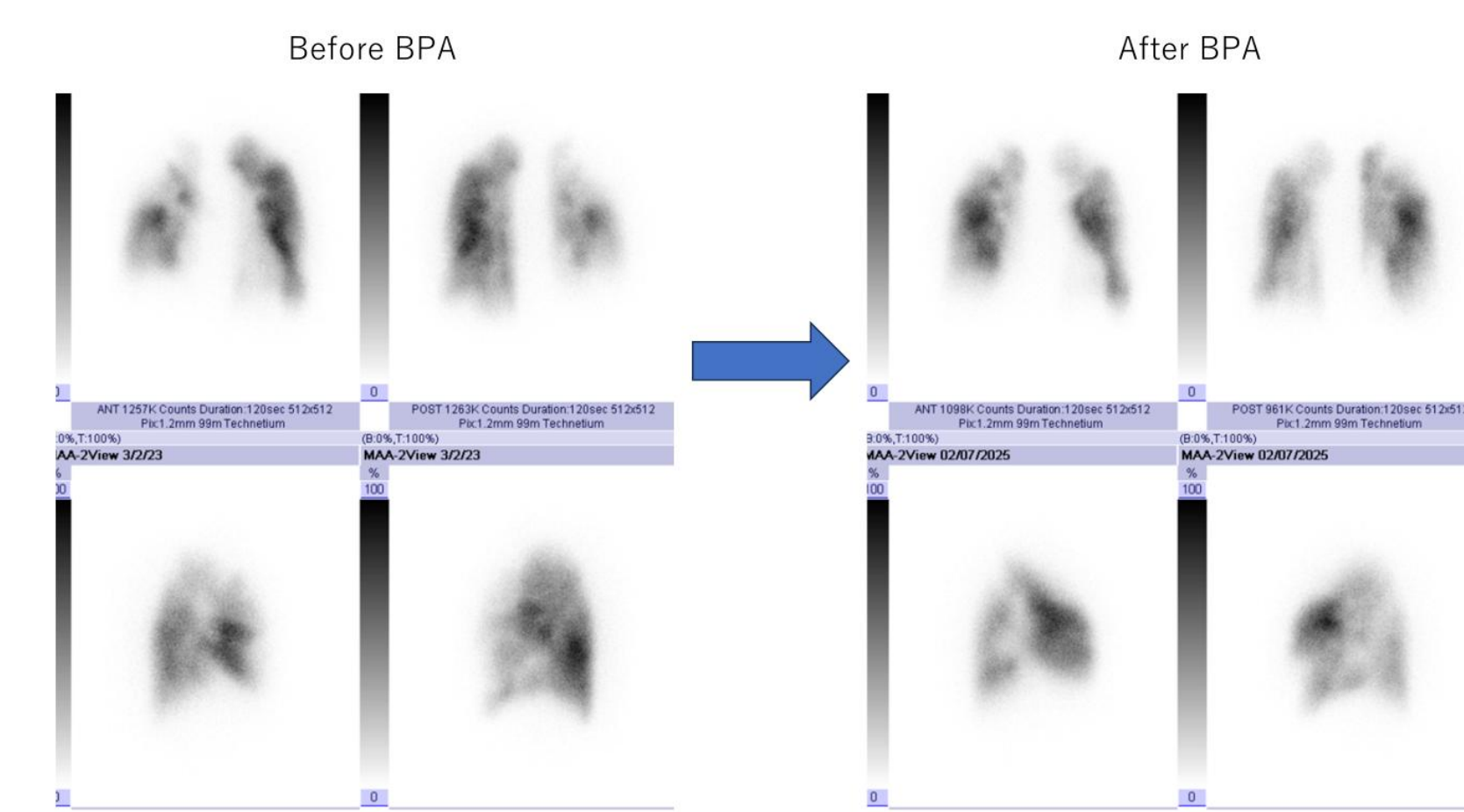
History of iodinated contrast allergy

- Generalized erythema and oxygen desaturation with iopamidol and iomeprol despite prednisolone premedication.

Multidisciplinary team discussion

- Predominantly peripheral disease → PEA not suitable; BPA indicated
- 4 BPA sessions

	Before BPA	After BPA
Mean PAP (mmHg)	37	23
PVR (Wood Units)	7.9	2.3
CI (L/min/m ²)	2.47	3.19
Mean RA (mmHg)	6	7
WHO FC	III	I
6MWD (m)	432	440
BNP (pg/mL)	232	18.2



Case example 2, Woman in her early 60s

History

- Acute PE diagnosed 10 years earlier

History of iodinated contrast allergy

- Flushing with iopamidol; anaphylaxis with prolonged hypoxemia to iomeprol despite prednisolone premedication.

Multidisciplinary team discussion

- Initial PEA: mPAP 50 → 34 mmHg; persistent symptoms (WHO-FC II)
- 1 year later: mPAP 40 mmHg, WHO FC III → BPA indicated
- 4 BPA sessions

	Before BPA	After BPA
Mean PAP (mmHg)	40	23
PVR (Wood Units)	6.1	2.5
CI (L/min/m ²)	2.97	3.63
Mean RA (mmHg)	7	3
WHO FC	III	I
6MWD (m)	350	440
BNP (pg/mL)	73.8	13.4



Discussion

- Lesion identification without contrast angiography appears feasible using previously acquired imaging data.
- IVUS-guided contrast-free BPA achieved substantial hemodynamic improvement in both cases despite conservative lesion selection.
- Management of procedural complications may require adjunctive imaging modalities such as CO₂ angiography, gadolinium-based contrast angiography, or cone-beam CT.
- The generalizability of this strategy remains uncertain and requires validation in larger studies.

Conclusion

- These cases suggest that IVUS-guided contrast-free BPA is feasible and may provide meaningful hemodynamic improvement in selected CTEPH patients with severe iodinated contrast allergy.

COI

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