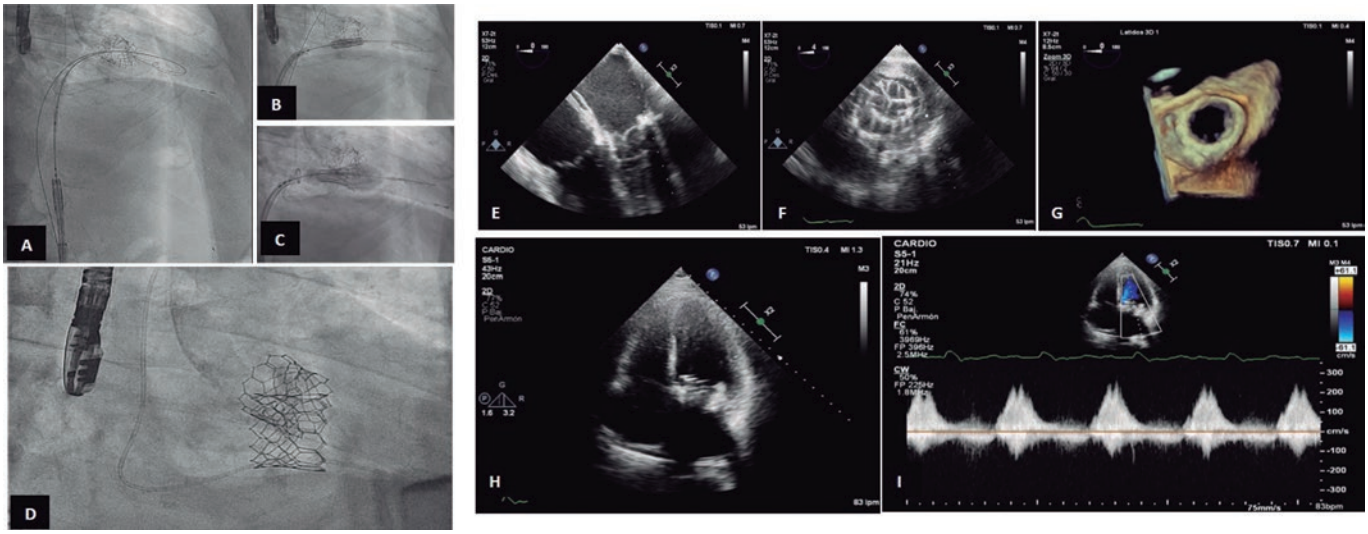

Figure 2. Valve implantation and outcomes. **A** to **D:** fluoroscopy showing the previous transcatheter aortic valve implantation, and the process of advancement, placement, and expansion of the aortic valve implanted in the mitral position with Safari high-support guidewire implantation into the left ventricle. **E:** mid-esophageal, 4-chamber view at 0 degrees of transesophageal echocardiography (TEE) imaging showing the already implanted biological valve in the mitral position. **F:** transgastric cross-sectional TEE image at mitral valve level showing the biological valve implanted in the mitral position. **G:** 3D TEE reconstruction of the mitral view showing the valve implanted in valve opening mode. **H** and **I:** apical 4-chamber transthoracic echocardiography showing the mitral valve implanted and diastolic mitral flow with a mean gradient of 8 mmHg.

CONFLICTS OF INTEREST

None reported.

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Impact of ischemic preconditioning on the radial artery vasomotor function

Influencia del preacondicionamiento isquémico en la función vasomotora de la arteria radial

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To the Editor,

Transcatheter radial access is the usual approach to perform a coronary angiography. The advantages of this access come with certain inherent limitations like radial spasm, endothelial dysfunction associated with the insertion of the introducer sheath, nonocclusive radial artery injuries, and postoperative artery occlusions.[1] Ischemic preconditioning (IPC) is an experimental phenomenon with confirmed protective effects by applying ischemia-reperfusion cycles to different target organs even at a distance.[2] We suggest that IPC may be relevant to prevent radial spasm, nonocclusive radial artery injuries, and arterial occlusion post-catheterization.

This is a small pilot study of patients scheduled for diagnostic or therapeutic coronary angiography. After the radial artery catheterization we performed:

1. An optical coherence tomography (OCT) of the radial artery after the administration of an anti-spasmolytic cocktail.

2. An IPC protocol or sham procedure through randomization.

3. An OCT of the radial artery after the protocol.

4. An OCT after the procedure was completed.

The PAI protocol consists of inflating the blood pressure cuff to 200 mmHg 3 times for 5 min with 5 min of rest between each ischemic cycle. The sham protocol is the same but here the cuff is inflated up to 10 mmHg only.

The OCT (LightLab Imaging Inc, Abbott Vascular, United States) was performed by 2 independent observers and included qualitative (the presence of nonocclusive radial artery injuries [intimal and intima-media dissections, white or red thrombus, and atherosclerotic plaques]) and quantitative analyses (volumetric analysis that measured the lumen contour frame by frame). A total arterial volume was generated for each of the 3 sequences with the same number of frames that were consistent with the same anatomical sections. The volume difference after the protocol was estimated relative to the baseline volume, and the minimum diameter, minimum lumen area, and percent maximum stenosis were determined for each sequence. In radial spasm by OCT the percent variation of the area using the proximal and distal areas as the reference (baseline, postoperative, and final) was analyzed frame by frame. Radial spasm was defined as a sudden decrease of the vessel area (> 50%) compared to the reference areas associated with greater media thickness (> 20% of baseline value). The study of atherosclerosis was conducted on the baseline OCT sequence and included 11 measurements every 5 mm. The intimal area, media area, and the corresponding maximum intima-media thickness were measured. In addition, the intimal thickness, intima-media ratio, and lumen stenosis were estimated as well.[3]

After being approved by the ethics committee, 30 patients were randomized on a 1:1 ratio to IPC or the sham procedure. Both the baseline characteristics and the procedural outcomes are shown on table 1. The analysis found a significant increase of the mean postoperative values of arterial volume compared to the baseline sequence. However, no differences were reported between the IPC and the sham group (total arterial volume $P = .176$; total arterial volume adjusted for body surface area $P = .199$). (figure 1) The presence of spasm after the intervention or at the end of the procedure was greater in the sham compared to the IPC group (40% [6] vs 6.7% [1]; $P = .08$) yet not statistically significant. None of the patients had clinical spasm. No differences were seen in the onset of nonocclusive radial artery injuries (IPC, 20% [3]; sham procedure, 20% [3]). No artery occlusions were seen at 30 days.

Table 1. Baseline characteristics and procedural outcomes

		N	Mean	SD	*P*
Age (years)	IPC	15	62.40	15.57	.624
	Sham	15	62.93	9.15	
BSA (m^2)	IPC	15	2.03	0.30	.713
	Sham	15	1.98	0.20	
SAP (mmHg)	IPC	15	136.93	18.70	.486
	Sham	15	130.80	18.54	
DAP (mmHg)	IPC	15	73.13	10.98	.902
	Sham	15	72.47	14.05	
Baseline total volume (mL)	IPC	15	285.53	97.88	.106
	Sham	15	234.60	90.07	
Post total volume (mL)	IPC	15	321.66	116.44	.512
	Sham	15	268.87	110.46	
Baseline BSA total volume (mL/m^2)	IPC	15	140.56	44.37	.161
	Sham	15	118.30	42.32	
Post BSA total volume (mL/m^2)	IPC	15	158.68	53.29	.187
	Sham	15	135.32	53.35	
Intima-media thickness	IPC	15	0.77	0.30	.683
	Sham	15	0.75	0.42	
Intima-media ratio	IPC	15	1.47	0.68	.436
	Sham	15	1.22	0.42	
Baseline stenosis (%)	IPC	15	18.60	9.78	.595
	Sham	15	19.49	10.45	
Post stenosis (%)	IPC	15	12.23	7.81	.713
	Sham	15	15.09	12.93	
Baseline minimum lumen area (mm^2)	IPC	15	4.28	1.77	.567
	Sham	15	4.09	1.79	
Baseline minimum diameter (mm)	IPC	15	2.28	0.50	.539
	Sham	15	2.23	0.47	
Post minimum lumen area (mm^2)	IPC	15	5.86	2.28	.367
	Sham	15	5.21	2.49	
Post minimum diameter (mm)	IPC	15	2.68	0.53	.389
	Sham	15	2.51	0.59	

BSA, body surface area; DAP, diastolic arterial pressure; IPC, ischemic preconditioning; post, postoperative; SAP, systolic arterial pressure; SD, standard deviation.

IPC had no effect on volume, the appearance of nonocclusive radial artery injuries or radial artery occlusion. However, a tendency was seen towards fewer radial spasms on the OCT.

This study greatest limitation was its small sample size, which could lead to low statistical power, and failure to detect significant differences when they actually exist.

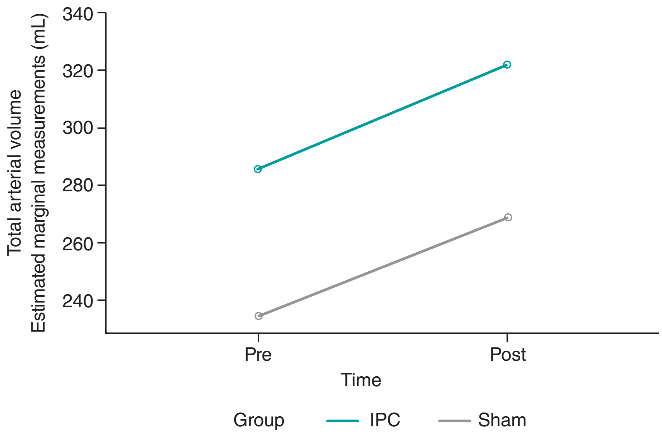

Figure 1. Total arterial volume variation between baseline (pre) and postoperative (post) sequences. There is an increased volume in both the sham and ischemic preconditioning (IPC) groups without statistically significant differences between the 2.

Despite being a widely studied phenomenon in the cath lab, IPC has shown modest results in large-scale trials.[4] A better understanding of the underlying mechanisms is deemed necessary to overcome the confounding and interaction factors, but also caution is advised, given its poor results in the real-world.

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AUTHORS' CONTRIBUTIONS

E. Arroyo-Úcar drafted the manuscript. E. Arroyo-Úcar, G. Pizarro Sánchez, and B. Ibáñez Cabeza participated in the process of data mining and clinical follow-up of the patients. E. Arroyo-Úcar, G. Pizarro Sánchez, and B. Ibáñez Cabeza were involved in the recruitment of the patients and the manuscript critical review. All the authors approved the final version of the manuscript.

CONFLICTS OF INTEREST

None whatsoever.

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Transcatheter closure of aorto-left atrial fistula

Cierre percutáneo de una fístula entre la aorta y la aurícula izquierda

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To the Editor,

Aorto-atrial fistulas are an extremely rare condition where an abnormal connection forms between the aortic structures and the cardiac atria. Among them, fistulas between the aorta and the left atrium (Ao-LA) are particularly uncommon, and mainly associated with complications like infectious endocarditis, paravalvular abscesses, aortic dissections, and cardiac surgery often damaging the aortic valve or root.[1] This is the case of a patient with a iatrogenic Ao-LA fistula successfully treated with a percutaneous Amplatzer device.

This is the case of an 82-year-old man admitted to the hospital due to acute heart failure. Three weeks earlier, he had undergone cardiac surgery with mitral and tricuspid valve repair through double annuloplasty plus left anterior descending coronary artery bypass with internal mammary artery graft.

The transthoracic echocardiography revealed the presence of a preserved biventricular and valvular function, but also an abnormal systolic and diastolic jet in the left atrium (figure 1A and video 1 of the supplementary data). On the transoesophageal echocardiography this jet corresponded to an Ao-LA fistula through the aortic

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