Application of Drug Coated Balloon Angioplasty for Pulmonary Vein Stenosis

Bhaskar Purushottam MD

Presenting on Behalf of:
Sachin Kumar Amruthlal Jain MD, Bhaskar Purushottam MD and Prakash Krishnan MD
Mount Sinai Hospital
New York, USA
Disclosure

Speaker name:

..............................................................................................

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

I do not have any potential conflict of interest
Clinical presentation

Chief Complaints: 47 y.o. male presents with shortness of breath following pulmonary vein isolation procedure using RFA

Past medical history: Atrial fibrillation, Hyperlipidemia, Type 2 DM

Meds: Atorvastatin, Metformin, Rivaroxaban and Omeprazole

Course:
June, 2013 - Persistent atrial fibrillation (during routine physical exam)
September, 2013 - Synchronized Cardioversion and started on Dronedarone
May, 2014 - Back in persistent atrial fibrillation
August, 2014 - Pulmonary Vein Isolation. Started on Flecainide 100 mg BID for three months post ablation – remained in normal sinus rhythm
November 2014 – Symptoms of shortness of breath
January, 2015 – CT pulmonary veins showed significant stenosis of all pulmonary veins
Initial Pulmonary vein PTA - 02/2015

- Bilateral common femoral venous [8.5 Fr for right and 11 Fr for left]
- ICE catheter was inserted and positioned in right atrium to visualize interatrial septum via left CFV access
- The right CFV 8.5 Fr sheath was exchanged for SL 1 sheath and transseptal catheterization was performed with ICE/fluoroscopy guidance.
- The SL 1 sheath was then exchanged for Agilis deflectable sheath.
- At this stage multipurpose catheter was inserted through Agilis into left atrium.
- Plain balloon sequential PTA was performed of all the pulmonary veins using the Sterling Monorail balloon [5.5 to 8 mm balloon]
- Pressure gradients (pre and post PTA) were as follows:
  1. Right Upper Pulmonary Vein: Completely occluded to 10 mm Hg
  2. Right Lower Pulmonary Vein: 16 mm Hg to 7 mm Hg
  3. Left Upper Pulmonary Vein: 38 mm Hg to 8 mm Hg
  4. Left Lower Pulmonary Vein: 32 mm Hg to 8 mm Hg
CT Angiogram of pulmonary veins -05/2015

- Performed for recurrent shortness of breath

Right
- Upper pulmonary vein – ostial severe stenosis (70-90%). Dimension 2 mm
- Lower pulmonary vein – ostial mild stenosis (<50%). Dimension 11 mm

Left
- Upper pulmonary vein – ostial moderate stenosis (50-70%). Dimension 8 mm
- Lower pulmonary vein – ostial moderate stenosis (50-70%). Dimension 6 mm
Right Upper Pulmonary Vein DCB Angioplasty (05/2015)

PRE PTA: 7 x 40mm Charger Balloon

DCB Angioplasty: 7 x 40 mm Lutonix
Right Upper Pulmonary Vein DCB Angioplasty (05/2015)

POST DCB PTA: Unsatisfactory Results

POST PTA: Following 9 x 40mm Charger Balloon

Right Upper Pulmonary Vein: 20 mm Hg to 1 mm Hg
Right Lower Pulmonary Vein: 15 mm Hg to 3 mm Hg
Left Lower Pulmonary Vein DCB Angioplasty (05/2015)

PRE DCB angioplasty
Left Lower Pulmonary Vein DCB Angioplasty (05/2015)

DCB angioplasty

POST PTA

Left Upper Pulmonary Vein: 22 mm Hg to 7 mm Hg
Left Lower Pulmonary Vein: 19 mm Hg to 5 mm Hg
Conclusion

- Follow up in August 2015, November 2016, May 2016 and May 2017: Asymptomatic. CT pulmonary veins [August 2015] showed patent ostium of all 4 pulmonary veins.

- We presume DCB acts in a similar manner as it does in femoropopliteal interventions.

- In an Animal study, prophylactic use of DCB during atrial fibrillation pulmonary vein muscle sleeve radiofrequency ablation showed prevention of pulmonary vein stenosis.*

Application of Drug Coated Balloon Angioplasty for Pulmonary Vein Stenosis

Bhaskar Purushottam MD

Presenting on Behalf of:
Sachin Kumar Amruthlal Jain MD, Bhaskar Purushottam MD and Prakash Krishnan MD
Mount Sinai Hospital
New York, USA