First-in-Man Transseptal Transcatheter Mitral Chordal Repair

OBJECTIVE
To present the first-in-man experience of transseptal transcatheter mitral chordal repair with 30-day follow-up.

CASE VIDEO SUMMARY
A 55-year-old male presented with decompensated heart failure and severe mitral valve regurgitation (MR) due to P2 prolapse and flail. Despite optimal medical therapy, he was in NYHA class III. Past medical history included coronary artery disease, paroxysmal atrial fibrillation, and a recently diagnosed prostate cancer. Further echocardiographic findings were reduced ejection fraction (42%), moderate aortic regurgitation, and severe left ventricular and atrial dilation. Heart team assessment deemed the patient at too high risk for open heart surgery (STS 4.6%) and enrolled him in the early feasibility study of the NeoChord Transcatheter NeXuS system. Work-up included a cardiac computed tomography to detect the target papillary muscle for anchor implantation. In the presented case, 2 neo-chords were placed on P2, anchored on the anterior papillary muscle and tensioned on a beating heart. The final result confirmed complete restoration of mitral valve function with no residual MR. At 30-day follow-up, the patient was clinically improved with sustained MR reduction and reliable anchor stability.

The design concept of the NeoChord was initially based on surgical chordal replacement, the gold standard procedure for patients with leaflet prolapse or flail. This first-in-man case demonstrates the feasibility and safety of the NeoChord NeXuS system to restore physiological mitral leaflet function by transseptal transcatheter neochord implantation. Similarly to the surgical counterpart, this technology respects the geometry of the heart with papillary anchor placement and has the potential to address both anterior and posterior leaflet pathologies. Although surgery remains the standard of care for degenerative MR, in selected cases this transseptal transcatheter treatment may constitute a viable alternative to address isolated leaflet disease with a favorable risk-benefit ratio. Longer-term follow-up and more patients are required to confirm these initial results and define the proper clinical and anatomical candidates.

CONCLUSIONS
This case illustrates successful transseptal transcatheter mitral chordal repair with 2 chords. This novel device provides a promising strategy to restore the natural physiologic functionality of the mitral valve in patients with leaflet prolapse or flail.

Azeem Latib (1), Andrea Scotti (1), Randolph Chitwood (2), Lionel Leroux (3), Thomas Modine (4), Stephan von Bardeleben (5), Edwin Ho (1), (1) Montefiore Medical Center, Bronx, NY, (2) East Carolina University, Greenville, NC, (3) Bordeaux University Hospital, Bordeaux, France, (4) Hôpital Haut leveque, Bordeaux, Gironde, (5) Mainz Valve Center, Mainz, Germany