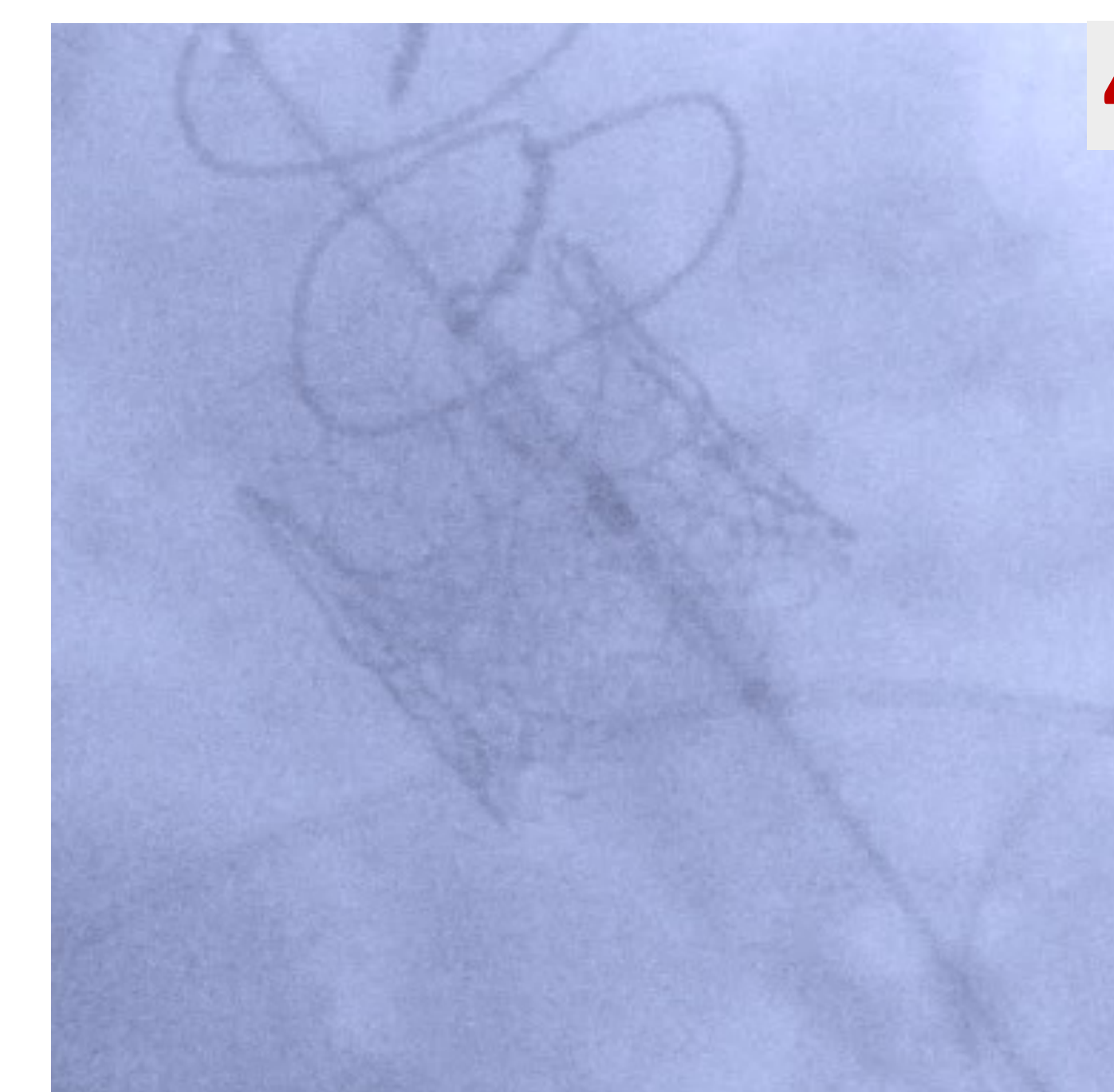
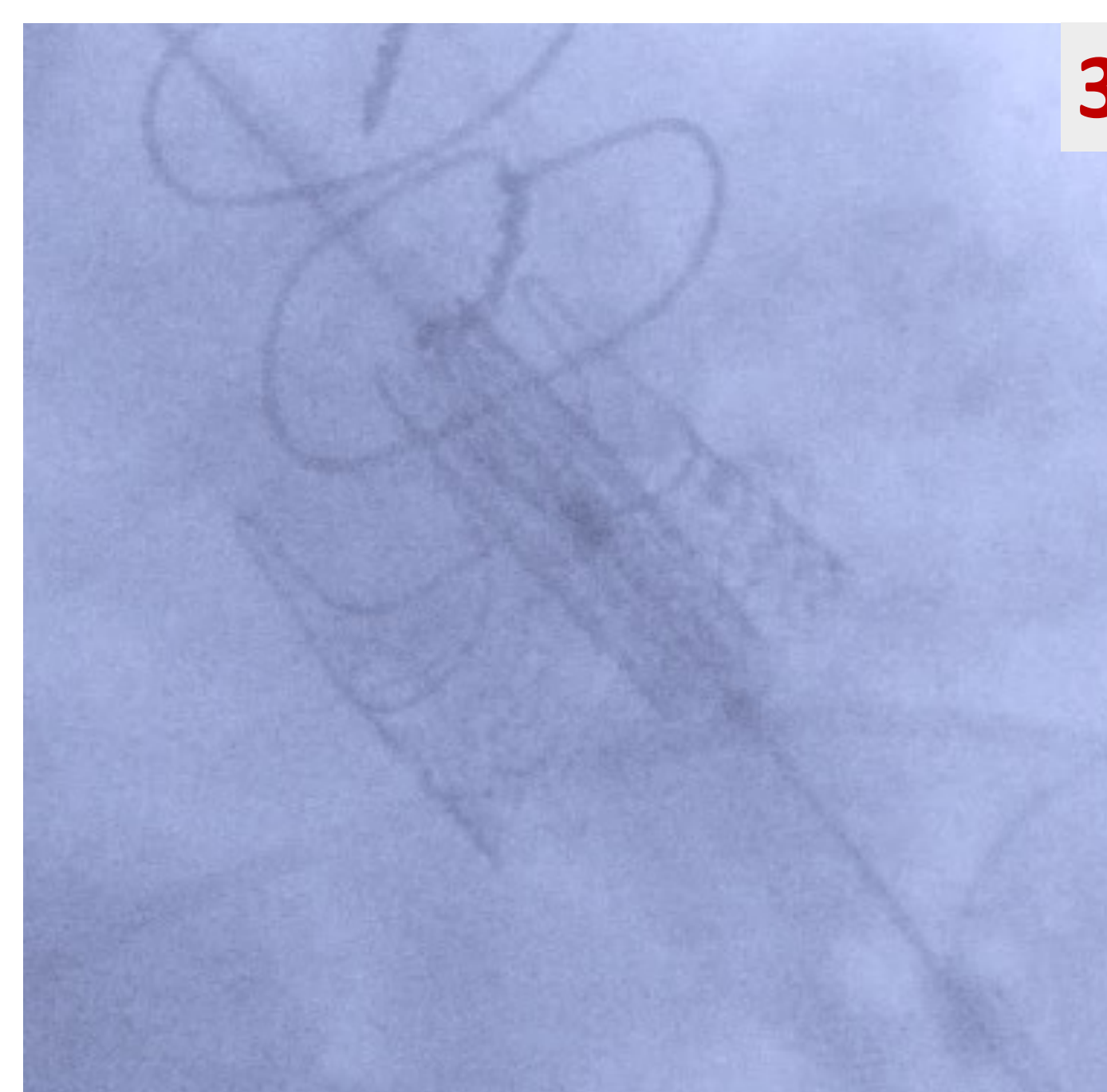


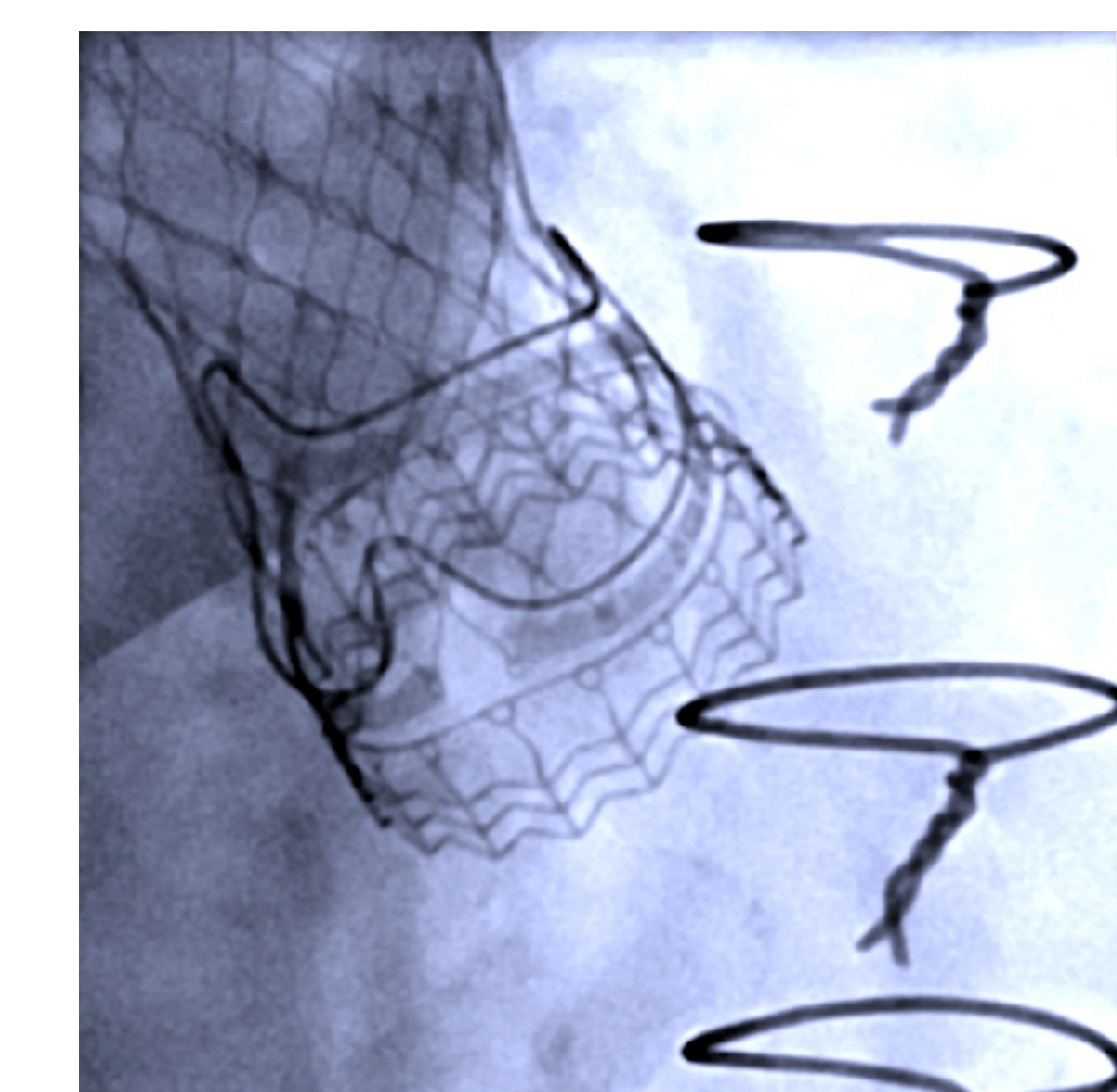
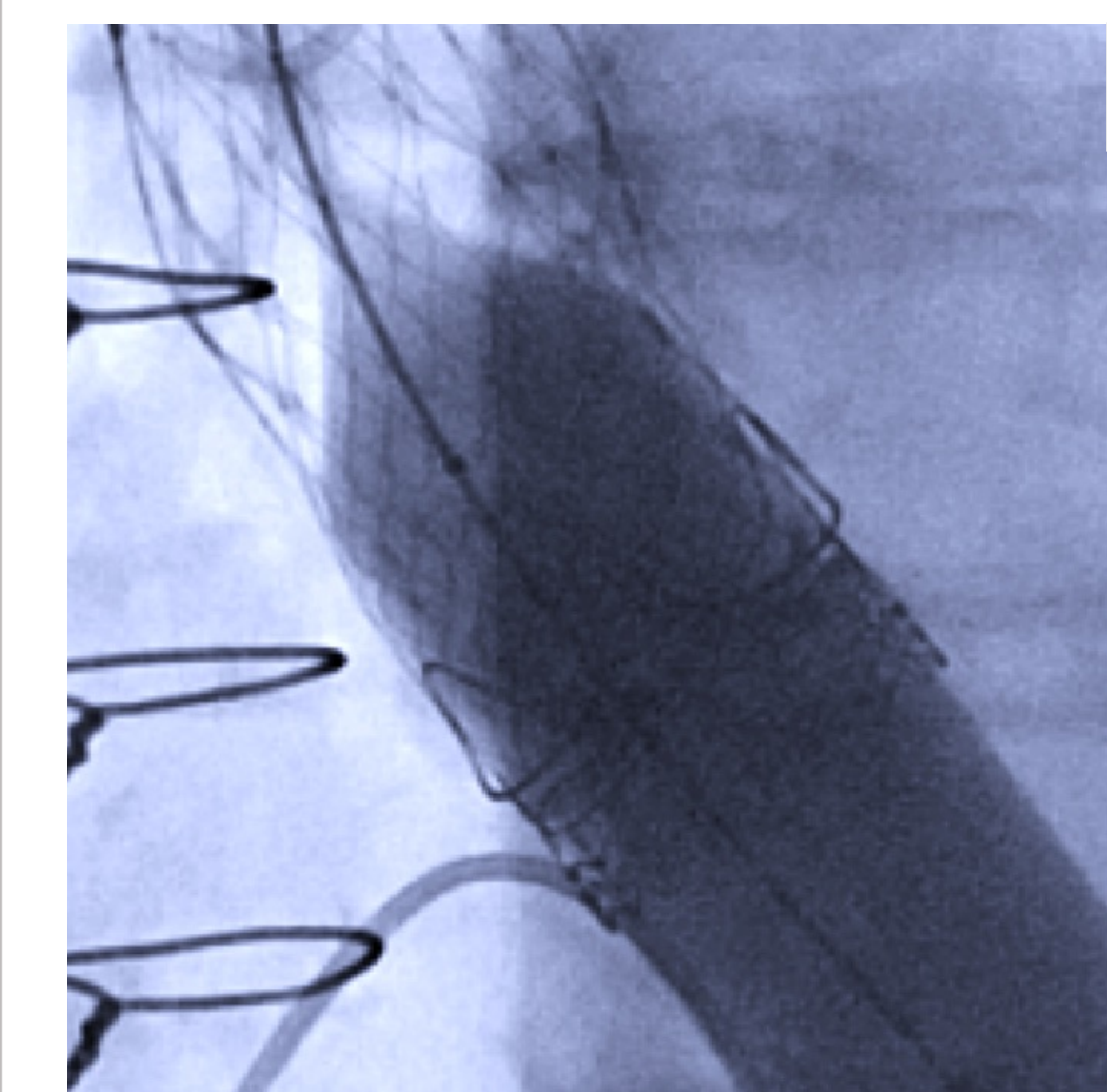
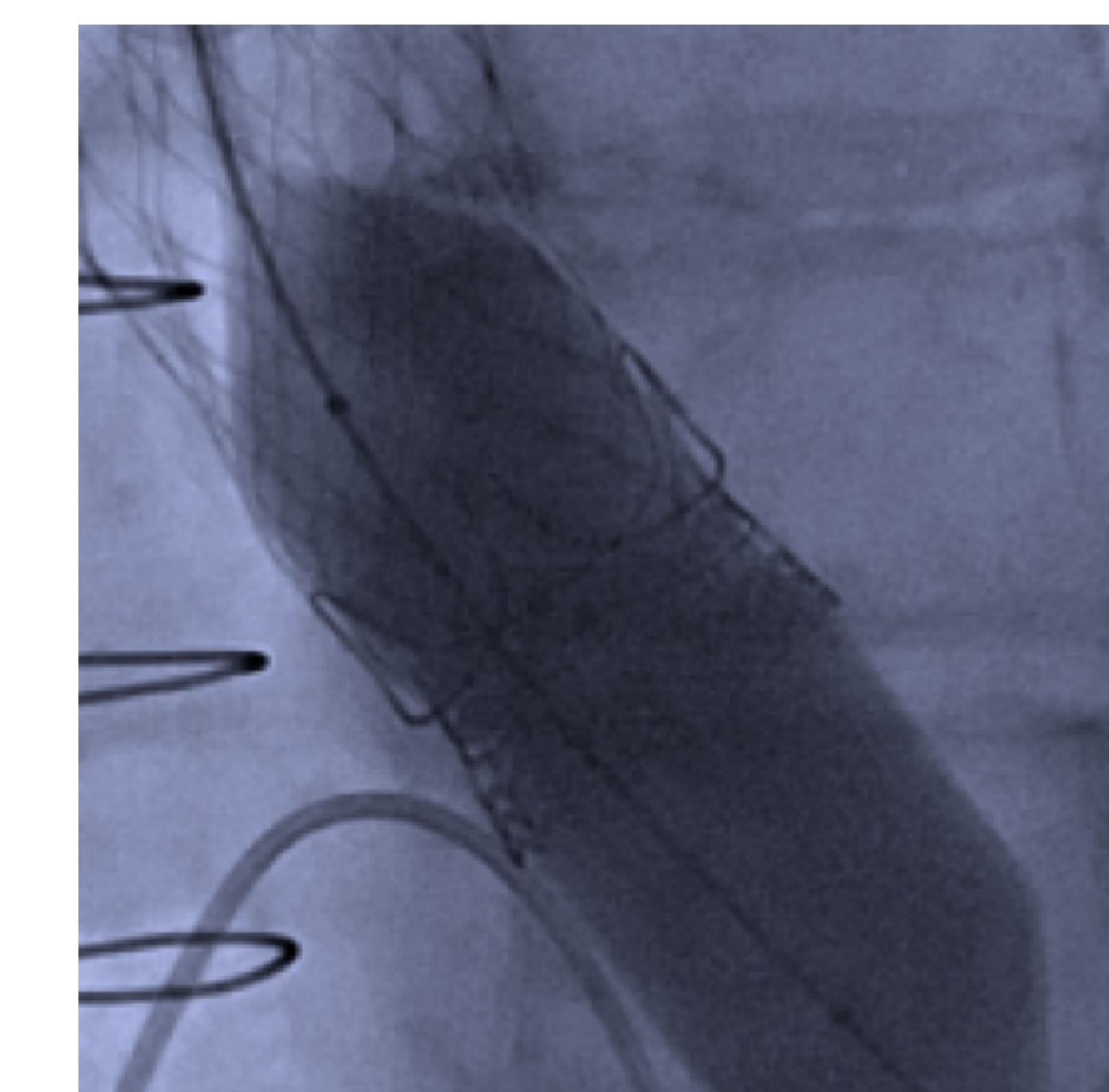
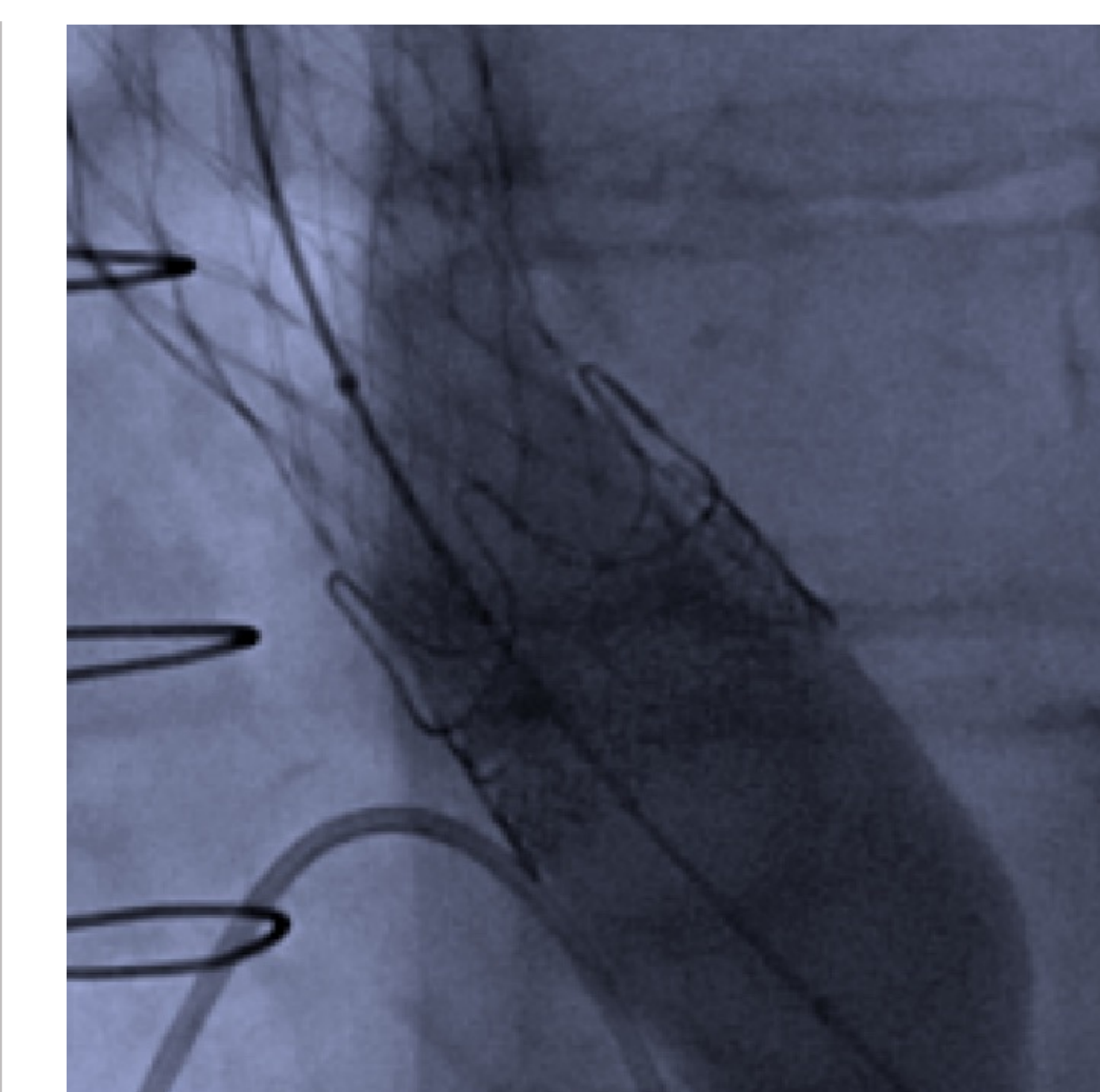
Objective: Valve-in-valve (ViV) TAVI has become a strategy to deal with degenerated aortic bioprosthesis. A benefit is the avoidance of the higher surgical risks of re-do cases, which however is limited by a higher risk of a valvular patient prosthesis mismatch. Interventional stent frame fracture during ViV implantation could reduce this risk. However, in rapid deployment valves, there is a lack of data for this procedure.

Methods: We demonstrate the interventional treatment of two cases of a degenerated aortic rapid deployment valve treated with ViV TAVI. Both patients (78 and 74 years of age) presented with a restenosed 21mm Edwards Intuity Elite valve (Edwards Intuity Elite Valve System, Edwards Lifesciences Corp., Irvine, CA, USA), and were treated by a transfemoral implantation of a balloon-expandable valve and a self-expandable valve respectively. To enhance the inner diameter of 19mm of the originally implanted valves, we used a non-compliant 22mm high pressure valvuloplasty balloon (Atlas Gold PTA dilatation catheter, Bard Peripheral Vascular Inc., Tempe, AZ, USA) (Fig. 1;2;5-7). In the first patient, the original prosthesis was predilated with 24 ATM. During ViV implantation, the lower bound of the crimped 23mm balloon expandable valve was aligned with the lower bound of the steel frame of the rapid-deployment valve and implanted (Fig. 3;4). In the second case, the 23mm self-expandable valve was implanted first with an alignment just 2mm below the stentframe of the original valve apparatus. Then, the ViV was postdilated with 22 ATM (Fig. 5-7). In both cases we were able to successfully fracture the stent frame of the valve apparatus (Fig. 8).

Results: No paravalvular leakage was detected at the end of the procedures. Also, no other interventional or rhythmological complication occurred. Postoperative examination showed a residual mean transvalvular gradient of 21mmHg after balloon expandable ViV implantation whereas the self-expandable valve showed a mean transvalvular pressure gradient of only 4mmHg.



Patient 1: Fig 1: Positioning of Atlas Gold PTA dilatation catheter; Fig 2: Prosthesis after cracking – stentframe deformation visible; Fig 3: Positioning of the balloon-expandable valve with lower bound alignment; Fig 4: Successful ViV implantation



Patient 2: Fig 5 - 8: Visual steps of valve-cracking during postdilatation; Fig 5: Beginning of balloonexpansion; Fig 6: dilatation of the stentframe of the valve apparatus; Fig 7: Cracking of the stentframe of the skirt; Fig 8: Visualisation of the cracked frame

Conclusion: In both interventions, dilatation and stent frame fracture of the rapid deployment valve was feasible with very high pressure although these valves are described as non-fracturable. ViV TAVI with the self-expandable (supra-anular) prosthesis showed a superior reduction of the transvalvular pressure.