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A Crossover Balloon Occlusion Technique for Percutaneous Closure After Trans-Femoral Aortic Valve Implantation

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Background: Vascular closure following large vessel access usually requires surgical cutdown and repair. To facilitate percutaneous closure after removal of 22 and 24F sheaths for transcatheter aortic valve implantation (TAVI), we developed an adjunctive crossover balloon occlusion technique (CBOT) in combination with the 10F Prostar™ percutaneous closure device (PCD).

Methods: The CBOT requires (1) contralateral femoral artery access and placement of a crossover sheath in the ipsilateral external iliac artery; (2) insertion of a properly sized balloon with low pressure inflation to occlude the vessel above the arteriotomy site; (3) two-suture Prostar™ PCD deployment with the balloon inflated to decompress the vessel and control bleeding; (4) balloon deflation and assessment of the arteriotomy site; (5) as needed, balloon re-inflation across either a dissection or the arteriotomy to reduce bleeding or to improve angiographic outcomes. 35 consecutive TAVI pt were treated using this percutaneous CBOT between Nov, 2008 and Sept, 2009 followed by assessment of clinical outcomes.

Results: Successful closure (no significant early or late arteriotomy site bleeding) was obtained in all but 2 patients (94.3%). The 2 failures were associated with obesity, vessel calcification, and high arteriotomy access; both patients had immediate and uneventful surgical repair aided by the proximal occlusion balloon. Overall, in these 35 pts, there were no deaths, mean Hgb drop was 2.3 ± 0.9 g/dl, 8 pts (25%) received transfusions (half due to non-access site reasons), and there was one large (> 5cm) hematoma (3.1%).

Conclusion: This adjunctive CBOT combined with the Prostar™ PCD resulted in controlled, safe, and successful percutaneous closure after TAVI and may be associated with reduced access site complications as well as accelerated pt mobilization.