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LV Lead Placement Via the Inferior Phrenic Vein

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LV lead placement as part of a CRT system implantation is usually performed by a transvenous approach using tributaries of the coronary sinus. The feasibility of transvenous lead positioning is determined by anatomical and technical factors, with overall success rates 90%. When CS access is not possible, surgical LV lead positioning may be considered, with a higher operative risk.

We report two cases of an occluded CS ostium, in which an unusual alternative approach for transvenous LV lead implantation was employed. In these cases the LV lead was placed through an anastomosis between the inferior phrenic vein and a posterolateral branch of the CS.

Patients were 67 and 77 years old. Both presented with ischemic cardiomyopathy (EF = 30% / 22%) and a history of CABG. QRS duration was 160 and 150 ms. A previous upgrade attempt in one patient resulted in dissection of the coronary sinus and cardiac tamponade.

Upon injection of dye, an occluded coronary sinus was demonstrated (presumably related to prior surgery). An opening was seen on the left side of the IVC, leading to an inferior phrenic vein connecting to a posterolateral CS branch. An LV lead was implanted in the posterolateral branch. Pacing thresholds were 2 V / 0.4 ms and 3.1 V / 0.8 ms, with impedances of 760 and 430 Ω. Total procedure time was 2:40 and 3:00 hours, with fluoroscopy times of 88 and 60 minutes, respectively.

Patients responded clinically to resynchronization, improving functional class to NYHA II. At two year follow-up patients had not been hospitalized for heart failure.

Conclusion:

The phrenic vein approach is a possible alternative for LV lead placement in cases where the CS is occluded or non accessible. This may provide those unusual patients the benefit of resynchronization, sparing the morbidity and risks of surgery.