EDITORIAL COMMENTARY

Stylet-directed His bundle lead placement: Early days of an emerging contender

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The development process for medical therapies rarely goes to plan. Even the soundest hypotheses, derived from the first principles, either succeed via unanticipated mechanisms or fail to generate meaningful results. His bundle pacing (HBP), however, delivers on the simple concept that using the native conduction system is preferable to using direct myocardial capture. Since its first description of use in clinical practice and subsequent increase in utilization, HBP has demonstrated superiority over both right ventricular pacing and biventricular pacing with respect to measures of electrical synchrony, hemodynamics, and clinical end points including patient-reported outcomes and mortality. HBP, despite representing the potential for true electromechanical resynchronization, has not yet reached widespread utilization despite demonstrated feasibility.

A key obstacle to widespread use is the limited array of available tools for HBP implantation. At present, the majority of HBP cases use the lumenless 3830 lead (Medtronic, Mounds View, MN) and C315 or C304 guide sheath (Medtronic). There are limited prior reports on stylet-directed His bundle implantation outside of Deshmukh’s original series and case reports. As the field awaits the development of additional tools, there may be another option already sitting at the ready.

In this issue of HeartRhythm, Orlov et al retrospectively analyze the HBP experience of a single operator, comparing the use of a stylet-driven lead (SDL) in 27 patients with that of the conventional lumenless lead (LLL) using the 3830 SelectSecure lead in 17 patients. The majority of patients were male (61%) (mean age 76 ± 12 years in the SDL group and 82 ± 6 years in the LLL group). Study patients underwent HBP for a variety of indications including complete heart block, cardiac resynchronization therapy indication, and atrioventricular node ablation. In the group undergoing His bundle implantation with a stylet-driven approach, an INGEVITY 7742 lead (Boston Scientific, Marlborough, MA) was used in the first 11 patients followed by a switch to a FINELINE II Sterox 4471 lead (Boston Scientific) in the remaining 16 patients. The authors note that they created a custom-shaped curve with the stylet in the majority of cases.

This study demonstrated the viability of an SDL with a comparable acute success rate (89% vs 88%), procedure time (129 ± 43 minutes vs 104 ± 43 minutes), and fluoroscopy time (9.6 ± 5.2 minutes vs 8.3 ± 5.0 minutes). The proportion of selective HBP was similar in both groups (20%). A patient from each group crossed over. There was an instance of acute crossover from the LLL to the SDL in a patient in whom a lumenless 3830 lead was not could be delivered. The crossover from the SDL to the LLL occurred at 6 months for a patient in whom a 7742 lead had a rise in threshold and lost left bundle branch block correction. The majority of reported follow-up was within 6 months, although data are available for several patients beyond a year. One notable difference between approaches was the capture threshold, which was higher in the SDL group (2.7 ± 1.4 V @ 1.2 ± 0.4 ms) than in the LLL group (1.5 ± 1.0 V @ 1.2 ± 0.4 ms). It is also worth noting that these data were all via a single operator and a learning curve was observed; procedural characteristics improved over the second half of the series. These data provide some support for alternative technical approaches to HBP, in terms of both safety and procedural characteristics.

Although there is cause for optimism, there are several important limitations to this study, the first of which is the limited long-term follow-up period. While 6- to 12-month data support acceptable lead characteristics, long-term threshold and battery longevity data would support the sustainability of an alternative approach. Another point to consider is the higher acute capture threshold in the SDL group than in the LLL group. The higher thresholds in the SDL group remained stable over time and did not suggest that thresholds continued to rise, which would severely limit the feasibility of the SDL approach for HBP. In addition, follow-up would provide data with respect to lead dislodgment rates, which in HBP series with the 3830 lead thus far have been comparable to the rate of right ventricular lead dislodgment. Lead dislodgment is a feared complication of HBP, especially in cases of heart block, where the outcome could be fatal. This has long been a concern for the SDL in HBP. This study specifically reported no lead dislodgments in the SDL group during the follow-up period.
Rather, 1 patient in the LLL group had a dislodged lead in the follow-up period. The small study size is also a limitation, further fragmented with 2 different lead types used in the stylet-directed group. However, this study from a single center new to HBP is laudable. Generalizability to other operators is challenging in a single-operator study, although the demonstration of a learning curve suggests that this will likely be expected for other operators. While it is difficult to gauge the steepness of the learning curve in this study, it is unlikely that the SDL approach alone will substantially increase the utilization of HBP, although it certainly provides an alternative to a possible bottleneck.

This series by Orlov et al shows the early feasibility of an alternative technical approach to HBP. With growing enthusiasm and utilization of both HBP and now left bundle pacing, additional options for lead delivery are required to help facilitate the delivery of a promising therapy. Further studies comparing an SDL with an LLL in a prospective head-to-head fashion would be important to confirm the validity of this study’s findings. Whether such studies will be performed remains to be seen.

References