Efficacy of renal denervation is positively impacted by longitudinal treatments

Methods: We used the V2 System™ (Vessix Vascular Inc., Laguna Hills, CA) for the renal denervation procedures. The V2 System consists of a proprietary bipolar RF generator and an over-the-wire low pressure balloon catheter with an array of radiofrequency (RF) electrodes mounted on the exterior in an offset helical pattern. Each temperature-controlled (TC) of bipolar energy is delivered for 30 seconds. A total of 15 juvenile Yorkshire swine were treated bilaterally (n = 3 in each group, see table). Efficacy was evaluated at 14 days post treatment using an HPLC-MS/MS method to measure kidney tissue norepinephrine (NEPI). In addition, histopathologic methods were used to assess the percentage of affected nerves.

Results: A single V2 treatment per artery with 95% circumferential coverage and 60% length coverage (21 mm) was applied resulting in 40% of nerves being affected and a NEPI reduction of 46% when compared to control group endogenous level. Increasing the circumferential coverage by 35% did not change efficacy. However, increasing coverage length by 40% significantly increased NEPI reduction to 78% and significantly increased the percentage of affected nerves to 58% (p < 0.05) and was comparable to surgical denervation.

Conclusions: Longitudinal denervations of the renal artery, in addition to circumferential denervations during RDN procedures, results in greater efficacy. The Vessix V2 Renal Denervation System may offer advantages since it allows for both longitudinal and circumferential treatments with short treatment duration.

TCT-11
Renal Sympathetic Denervation - Inducing An Instantaneous And Persisting 24h Ambulatory Blood Pressure Drop In Patients With Resistant Hypertension – Results From The Halle-RDN-Registry

Methods: We study carefully investigated the early and subsequent blood pressure reductions after RDN in a cohort of 120 consecutive patients with resistant hypertension (systolic BP ≥150 mm Hg on ≥3 antihypertensive drugs). Baseline values included a mean age of 64.5±9.4 years, 48% women, 45% diabetic, 18% coronary artery disease and 5.7 ± 2.15 antihypertensive medications. A 24-h Holter BP monitoring was recorded in every patient 24h before as well as 24h, 3 and 6 months after RDN. BP readings were then averaged according to daytime (7:00am-22:00pm), nighttime (22:00pm-7:00am) and 24 hours intervals. All data were statistically analysed with repeated measures ANOVA and Greenhouse-Geisser correction if indicated.

Results: In treated patients mean averaged systolic 24h BP was reduced by 9.68±1.59 mmHg (p < 0.001; n = 120) during the first 24 hours. Systolic blood pressure reduction appeared to increase much higher at daytime (12.1±1.63 mm Hg; p < 0.001) compared to nighttime (4.4±1.79 mm Hg; p = 0.016) which might indicate the role of sympathetic activity at daytime. A concordant effect on diastolic BP was observed: 5.9±0.88 mmHg (p < 0.001). Systolic BP reduction sustained at 3 (6.3±1.84 mm Hg, p < 0.005, n = 74) and 6 months (6.7±3.0 mm Hg, p = 0.001, n = 38) without further decrease.

Conclusions: In patients with resistant hypertension, catheter-based RDN results in an immediate and persisting reduction of systolic and diastolic ABPM. Compared to office-based data ABPM effects are expectedly less pronounced. Our analysis did not confirm the so far described gradual drop in BP up to 6 months. On the contrary a slight non-significant compensation of BP reduction was observed after the initial drop between day one and the 3 as well as 6 months follow-ups.

TCT-12
Long-term Follow-up of Catheter-based Renal Denervation For Resistant Hypertension Confirms Durable Blood Pressure Reduction

Methods: The study was a single-center, prospective, randomized study and was performed at 11 hospitals in Germany. The study included 120 patients with resistant hypertension who were assigned to undergo catheter-based renal denervation (n = 60) or medical therapy (n = 60) for a 2-year follow-up period. The primary endpoint was change in systolic BP from baseline to 2 years of follow-up.

Results: The primary endpoint was met in 92.0% of the renal denervation group and in 76.7% of the medical therapy group (p = 0.003). The mean change in systolic BP was -12.7 ± 20.3 mm Hg in the renal denervation group and 1.6 ± 14.1 mm Hg in the medical therapy group (p = 0.003). The percentage of patients with at least 10% reduction in systolic BP was 63.3% in the renal denervation group and 14.0% in the medical therapy group (p < 0.001).

Conclusions: Catheter-based renal denervation is an effective and durable treatment option for resistant hypertension. The results of this study support the use of renal denervation as a therapeutic option for patients with resistant hypertension who have failed to respond to maximum medical therapy.

Methods:
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