ACCElerated thrombolySiS for Post-TThrombotic Syndrome using the Acoustic Pulse Thrombolysis EkoSonic(r) Endovascular System:

Results of a Multi-center Study

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Background & Purpose

- Post-thrombotic syndrome (PTS) occurs in up to 50% of patients (pts) with DVT despite appropriate anticoagulation.

- Chronic DVT and PTS can be debilitating, while reducing one’s quality of life. When standard of care is ineffective, treatment options are limited.

- A multi-center, prospective, single-arm study evaluated the efficacy & safety of endovascular recanalization, including ultrasound-accelerated, catheter-directed thrombolysis (USCDT) in pts suffering from chronic DVT and PTS.
### Materials & Methods

#### Inclusion criteria:
- femoral DVT diagnosed ≥ 6 months prior
- Villalta Score (VS) ≥ 8
- failure of 3 months conservative therapy
- The primary efficacy endpoint was a reduction in VS of ≥ 4 at the 30-d post-USCDT in ≥50% pts.

#### Exclusion criteria:
- isolated iliofemoral DVT
- high bleeding risk
- complete popliteal vein occlusion
- filling defect ≥ 3 cm into IVC
- The primary safety endpoints were major bleeding events within 72h of starting the procedure and pulmonary embolism (PE) within 30d post-USCDT.
Materials & Methods

Protocol

- Wt-based enoxaparin BID pre-procedure
- Appropriate access to obtain complete direct in-line flow
- Cross occlusion using standard CTO techniques
- PTA diseased segments to appropriate “normal” vessel size
- EKOS lysis @ 0.5-1.0 mg/hr ≥ 12 hr
- F/U w/ PTA +/- pelvic stenting (to lesser troch) if needed
- Discharged on enoxaparin 1mg/kg BID x 1 mo + ECS
- Transition to oral agent @ 1 mo
- Initiate exercise program 2-3 days post-op
- F/U @ 30, 90, 180 & 365 days w/ DUS
Results

- N = 78 pts, 82 limbs
- DVT Age: mean 13.2 mos
- TPA mean dose: 18.5 mg
- TPA mean duration: 22.8 hrs
- 6% had revascularization events w/in 30 days
- Pt age mean: 54.6 yrs
- Gender: M=68%, F=32%
- Limb: Lt = 60%, Rt = 40%
- Mean Hospital stay: 3.4 days

Primary Endpoint:
- 67% reached 1° endpoint of Villalta reduction of ≥ 4 (p = 0.003)

Safety Endpoint:
- 1 major bleed - (1.3%) Related to AC (died at 32 days of multi-organ failure)
- Recurrent DVT N = 3 (3.8%)
- PE N = 1 in 30 days (1.3% - 0 during hospitalization)
Villalta Results

mean improvement 47.9% from baseline @ 360d

Baseline vs post treatment follow up intervals: $p < 0.0001$

Intent to Treat Population

### Villalta Score

- **Baseline**: 15.5
- **30 Days Post**: 9.7
- **90 Days Post**: 8.7
- **180 Days Post**:
- **365 Days Post**:
## Results: Villalta Scale

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<th>N (L)</th>
<th>Mean</th>
<th>from Baseline</th>
<th>% Change</th>
<th>P from Baseline</th>
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<td>30 d Post</td>
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Change in Villalta Score: \( p < 0.0001 \) (95% CI) at each interval (using Mixed Model Repeated Measure - MMRM)
VCSS Results

mean improvement 42.3% from baseline @ 365d

Baseline vs post treatment follow up intervals: p < 0.0001

Intent to Treat Population
# Results: VCSS

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<td>42.3%</td>
<td>&lt;0.0001</td>
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Change in VCSS Score:  *p < 0.0001* (95% CI) at each interval (using Mixed Model Repeated Measure - MMRM)
VEINES-QOL Results

mean improvement 36.2% @ 365 d

Baseline vs post treatment follow up intervals: \( p \leq 0.0001 \)

Intent to Treat Population
## Results: VEINES-QOL

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Change in VEINES-QOL Score: \( p < 0.0001 \) (95% CI) at each interval (using Mixed Model Repeated Measure -MMRM)
Results Summary:

ACCESS PTS is a Statistically Significant Study:

- 67% reached $1^0$ endpoint of Villalta reduction of 4 ($p = 0.003$)
- Villalta improvement @ 30d = 6 pts & 35% ($p < 0.0001$)
- Villalta improvement @ 365d = 8 pts & 48% ($p < 0.0001$)
- VCSS improvement @ 30d = 3.8 pts & 27% ($p < 0.0001$)
- VCSS improvement @ 365d = 5.7 pts & 42% ($p < 0.0001$)
- VEINES QOL improvement @ 30d = 10 pts & 21% ($p < 0.0001$)
- VEINES QOL improvement @ 365d = 19 pts & 36% ($p < 0.0001$)

** Final evaluation will include DUS patency & venographic improvement
Conclusions

For Pts suffering from Chronic Veno-Occlusive Disease & PTS:

- Endovascular intervention using USCDT with PTA
  - safe & effective treatment for recanalizing chronic venous occlusions
- ACCESS PTS treatment protocol:
  - Statistically improves PTS scores & sequelae (Villalta & VCSS)
  - Statistically improves QOL (VEINES-QOL)

There is hope for PTS patients who have failed standard of care therapy
References

1. ACCESS PTS Trial. www.ClinicalTrials.gov identifier: NCT02159521