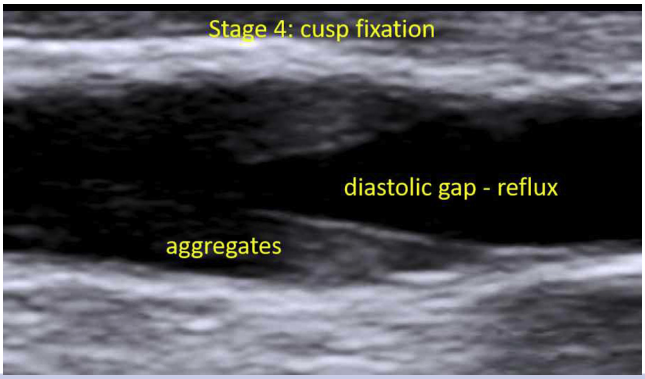

Fig. Aggregates identified with fixation of valve cusps.

up to 40 MHz; Vevo MD [SonoSite, Bothell, Wash]). Video recordings (manual three-dimensional scans) were provided for review and analysis by five experienced ultrasound investigators.

Results: Six different stages of valve changes could be determined. In stage 1, alteration of sinus hemodynamics (reduction of flushed sinus volume) was present in 102 of 180 cases (56.7%). In stage 2, restriction of cusp function due to aggregates while maintaining valve closure was seen in 64 cases (35.6%). Of 180 cases, 6 (3.3%) showed fixation of cusps (without visible motility) but yet without reflux (stage 3), whereas in 8 cases (4.5%), there was fixation of cusps causing diastolic gap and reflux (stage 4; Fig). Stages 5 and 6 were related to segments with significant reflux (>1000 ms, >10 cm/s), showing valve regression and finally loss of valve structures and aggregates.

Conclusions: Permanent blood cell aggregates at the valve sinus seem to indicate successive stages of venous insufficiency, correlating with specific relations of sinus shape and flow. Analysis of valves and aggregates allows a new staging of vein damage and thus a more detailed determination of the individual history of disease with potential impact for early-stage treatment or prevention.

Author Disclosure: J. C. Ragg: Nothing to disclose.

Comparative Efficacy and Safety of Direct Oral Anticoagulants and Warfarin for the Treatment of Deep Venous Thrombosis and the Prevention of Post-Thrombotic Syndrome

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Background: In recent years, clinical trials have shown that direct oral anticoagulants (DOACs) are at least as effective and safe as oral warfarin for the treatment of venous thromboembolism (VTE). However, there are few studies comparing efficacy and safety of different DOACs for VTE. The purpose of this study was to compare antithrombotic and hemorrhagic effects of different DOACs and warfarin in patients with acute deep venous thrombosis (DVT). In addition, we studied preventive effects of these anticoagulants on the post-thrombotic syndrome (PTS).

Methods: Consecutive patients with acute DVT who were treated with anticoagulants were enrolled. The cumulative incidence of VTE recurrence and bleeding events was assessed. Furthermore, we assessed cumulative complete thrombus resolution and development of PTS.

Results: During the 3-year period, 264 patients were treated with anticoagulation alone. Of these, 69 patients (26%) received apixaban, 64 (24%) received edoxaban, 67 (25%) received rivaroxaban, and 64 (25%) received warfarin. There were no significant differences in mean age ($P = .131$), sex distribution ($P = .858$), body mass index ($P = .392$), distribution of DVT (proximal vs distal, $P = .072$), proportion of concomitant pulmonary embolism ($P = .317$), and duration of anticoagulation ($P = .117$) between the groups. The higher incidence of the recurrent VTE was found in the warfarin group; however, this was not statistically significant (log-rank, $P = .478$). Similarly, bleeding events were more common in the warfarin and rivaroxaban groups, and fewer bleeding complications were noted in the apixaban group; this did not result in any significant difference (log-rank, $P = .303$). In contrast, apixaban showed earlier thrombus resolution, and the cumulative thrombus resolution was highest in the apixaban group, followed by the rivaroxaban group (log-rank, $P = .022$,). Development of PTS was higher in the rivaroxaban and warfarin groups, but no significant difference was found in cumulative development of PTS (log-rank, $P = .943$).

Conclusions: Although DOACs did not appear to differ in the recurrent VTE events, the bleeding complications, and the development of PTS, apixaban showed the earliest thrombus resolution among the anticoagulants studied. These results suggest that apixaban seems to be safer and more effective than some of its competitors in the management of acute DVT.

Author Disclosures: T. Yamaki: Nothing to disclose; **Y. Sasaki:** Nothing to disclose; **K. Hashimoto:** Nothing to disclose; **W. Kamei:** Nothing to disclose; **Y. Hasegawa:** Nothing to disclose; **A. Osada:** Nothing to disclose; **H. Konoeda:** nothing to disclose, **H. Sakurai:** Nothing to disclose.

Global Management of Venous Leg Ulceration: Pre-EVRA Publication

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Background: Various guidelines exist worldwide for the diagnosis and management of venous leg ulcers. However, these guidelines are difficult to implement and may not be followed, resulting in disparate treatment of patients globally.

Methods: An online 26-question survey was created to evaluate the current global management of venous leg ulceration. The survey was classed as a service evaluation according to the Health Research Authority decision tool and therefore did not require Health Research Authority or ethical approval. The link to the survey was e-mailed globally by several vascular and venous societies to approximately 15,000 participants using local, national, and international mailing lists (November 2017-February 2018).

Results: There were 799 complete responses received from 86 countries. The respondent physicians saw a median of 10 patients per month. The median time of referral from primary to secondary care was 6 weeks. Of the respondents, 60% arranged an ankle-brachial pressure index on the first visit and 84% performed a venous duplex ultrasound examination, with 95% prescribing compression for those in whom it was not contraindicated; 78% thought that treatment of superficial truncal venous reflux by endovenous intervention or surgery benefits ulcer healing, whereas 80% thought it benefits recurrence; 59% performed endovenous intervention or surgery before ulcer healing, with 73% performing a duplex ultrasound examination after intervention to assess technical success.

If the Early Venous Reflux Ablation (EVRA) study results were positive, 46% agreed that they would change practice, with 43% stating they would not, but 86% of those already treated before ulcer healing.

Conclusions: The survey showed a diversity of treatment pathways. The need to develop a robust clear pathway for patients with leg ulceration is clearly required, which should be informed by the results of the EVRA trial.

Previously presented at the Royal Society of Medicine's Venous Forum, London, UK, June 25, 2018.

Author Disclosures: F. Heatley: Nothing to disclose; **S. Onida:** Nothing to disclose; **A. H. Davies:** Nothing to disclose.

Graduated Compression Lower Limb Volume Control in Different Muscle Pump Activation Conditions and Related Limb Shape Impact

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