Factors influencing choice of treatment modality for varicose veins in Singapore

Dear Editor,

Chronic venous insufficiency (CVI) is common and potentially debilitating.¹ Following technological advances, management of CVI has shifted from traditional high tie, ligation and stripping to minimally invasive endovenous ablative techniques, resulting in faster recovery.²

While the National Institute of Health and Clinical Excellence (NICE), UK³ and the Society of Vascular Surgery, US⁴ that cater largely to Western populations^{5,6} recommend endothermal ablation as first line treatment for CVI, there are no Singaporean guidelines for varicose vein treatment. Asian and Caucasian superficial venous anatomy and reflux patterns can differ significantly,⁷ with Asians presenting with more severe CVI than their Caucasian counterparts. Hence the applicability of the UK and US guidelines to the Singapore context may be limited.⁸

This study aimed to investigate the modalities offered by vascular surgeons in Singapore for the treatment of CVI and factors influencing their choice.

Questionnaire and analysis. A postal questionnaire was sent to all accredited members of the Society for Vascular and Endovascular Surgeons of Singapore, accompanied by a letter explaining the aims of the study. Vascular surgeons in both restructured public and private hospitals were included.

Four key areas assessed were the type of venous practice, motivations and obstacles faced in the use of treatment, follow-up practice, and clinical scenarios where respondents had to choose their preferred treatment modality.

Numerical data were presented as mean (standard deviation) for parametric and median (interquartile range) for non-parametric data. Factors that influenced treatment choices were ranked by the respondents according to perceived importance. Consensus was defined as when >33% of the respondents responded in agreement in view of the small cohort (n=34).

Baseline characteristics of respondents. Between April and December 2018, 31/34 (91.2%) vascular surgeons in Singapore responded to the questionnaire; 24/31 (77.4%) surgeons worked in public restructured

hospitals, 6/31 (19.4%) worked in the private sector and 1/31 (3.2%) worked in both. The mean age of respondents was 41.7 ($\pm$ 5.9) years and the mean number of years practising as a vascular specialist was 8.8 ($\pm$ 5.5) years.

The median range of superficial venous procedures performed annually was 51–100; 19/31 (61.3%) respondents indicated that they treated CVI of Clinical, Etiological, Anatomical, Pathophysiological classification (CEAP) $\geq$ 3 with endovascular or open techniques, and CEAP $\leq$ 2 were treated conservatively with compression hosiery.

Factors influencing choice of treatment. Open surgery (22/31, 70.9%), cyanoacrylate glue (CAG) ablation (20/31, 64.5%) and radiofrequency ablation (20/31, 64.5%, Fig. 1) were the 3 most commonly offered treatment modalities. “Clinical pattern of venous reflux” (23/31, 74.1%) was the most important factor influencing respondents’ choices of treatment, followed by “duplex ultrasound findings of anatomy of truncal vein” (18/31, 58.0%) and “facilities available” (7/31, 22.5%). Only 4/31 (12.9%) ranked “guideline recommendations” among the top factors in influencing treatment choice.

Respondents had consensus in choosing treatment based on truncal vein anatomy (90.3%), treating from the lowest point of truncal reflux (71.0%), performing stab phlebectomies concurrent with truncal ablation (77.4%), and prescribing post-operative compression stockings (77.4%).

Endothermal ablation with phlebectomy was the preferred mainstay treatment for majority of the scenarios. There was consensus (35.5%) for the use of endothermal ablation with phlebectomy in patients with “very extensive varicose veins in one and both legs”. There was also consensus (35.5%) for conservative management in “patients above 80 years of age”. However, there were several instances where other treatment options were preferred, such as mechanochemical endovenous ablation (MOCA) for “below knee great saphenous vein (GSV) incompetence” and “total GSV incompetence”; CAG for “patients above 80 years of age” and patients with “below knee GSV incompetence”; conservative treatment for “patients above 80 years of age”, patients

Fig. 1. (A) Preferred treatment modality (N=31). (B) Ranking importance of factors influencing treatment choice. (C) Respondents' response to common treatment practices. (D) Treatment preference for various scenarios. (Colour figure available online.)

CAG: cyanoacrylate glue (ablation); CHIVA: Conservatrice Hémodynamique de l'Insuffisance Veineuse en Ambulatoire (ambulatory conservative haemodynamic correction of venous insufficiency); DUS: duplex ultrasound; DVT: deep vein thrombosis; EVLA: endovenous laser ablation; EVRF: endovenous radiofrequency ablation; GA: general anaesthesia; GSV: great saphenous vein; LA: local anaesthesia; MOCA: mechanochemical endovenous ablation; PAD: peripheral artery disease; RFA: radiofrequency ablation; SSV: small saphenous vein; UGFS: ultrasound-guided foam sclerotherapy; US: ultrasound; VTE: venous thromboembolism

with “concomitant severe deep venous reflux” and cosmetic reasons; and surgery for “very large incompetent truncal vein”.

Post-operative follow-up. There was no consensus in post-operative follow-up interval and performing post-operative duplex ultrasound. More than half of the vascular surgeons (54.8%) scheduled clinical follow-up 2 weeks post-operatively.

Discussion. Our study attempted to investigate the beliefs and practices of vascular surgeons in Singapore. Our response rate (91.2%) surpassed that of the UK and Canada-based studies we reviewed.^{5,6}

Endothermal ablation, open surgery and CAG ablation were the most commonly offered treatment modalities, consistent with present NICE guidelines. When deciding treatment for CVI, clinical reasons most strongly influenced the decisions of vascular surgeons in Singapore, with pattern of disease and anatomical

findings on duplex ultrasound being the predominant factors surgeons consider. Guideline recommendations were not commonly cited as influencing treatment choice, reflecting the preference for individualised treatment for different CVI presentations. Possible reasons for variation in practice include prior training expertise, beliefs, cost concerns and diversity of patient pool.

Endothermal ablation with phlebectomy was favoured for treating extensive unilaterally (41.9%) or bilaterally (38.7%) varicose veins, and women (35.5%). This was in contrast with 9.7%, 19.4% and 6.5% who preferred open surgery for unilateral varicose veins, bilateral extensive varicose veins and women respectively. Endothermal ablation was likely preferred due to the superior cosmetic outcome and lower risk of saphenous nerve damage.

MOCA was favoured by vascular surgeons in treating below knee GSV incompetence (35.5%), compared to

Fig. 1. (A) Preferred treatment modality (N=31). (B) Ranking importance of factors influencing treatment choice. (C) Respondents' response to common treatment practices. (D) Treatment preference for various scenarios. (Colour figure available online). (Cont'd)

(C)

(D)

CAG: cyanoacrylate glue (ablation); CHIVA: Conservatrice Hémodynamique de l'Insuffisance Veineuse en Ambulatoire (ambulatory conservative haemodynamic correction of venous insufficiency); DUS: duplex ultrasound; DVT: deep vein thrombosis; EVLA: endovenous laser ablation; EVRF: endovenous radiofrequency ablation; GA: general anaesthesia; GSV: great saphenous vein; LA: local anaesthesia; MOCA: mechanochemical endovenous ablation; PAD: peripheral artery disease; RFA: radiofrequency ablation; SSV: small saphenous vein; UGFS: ultrasound-guided foam sclerotherapy; US: ultrasound; VTE: venous thromboembolism

25.8% for total GSV incompetence. Below knee GSV incompetence treated with MOCA has been shown to have faster recovery and lower post-procedural pain.⁹ The choice of conservative management with stocking and venoactive medication was influenced by patients' age (>80 years old, 41.9%), possibly because elderly patients with physical impairments were less likely to comply with treatment such as compression stockings.¹⁰

There were several limitations to our study. First, due to the wide variety of treatment options available, only the more commonly used modalities were included in our questionnaire for pragmatic purposes. Second, as this was a questionnaire administered on a self-reported basis, there might have been response bias where respondents were more receptive to newer treatment modalities. Nevertheless, the response rate of >90% was uncharacteristically high, lending strength to the findings.

Conventional treatment modalities continue to be mainstays of CVI treatment in Singapore. Vascular surgeons had consensus in certain aspects, but also had differing opinions on the preferred treatment modalities for different scenarios. Future studies comparing the efficacy of various treatment modalities would help to further examine consensus among vascular surgeons in Singapore and aid in forging guidelines for treatment of varicose veins in Singapore.

Acknowledgement

This project was funded by a SingHealth Medical Student Talent Development Award (SMSTDA) (2018/2019).

REFERENCES

1. Evans CJ, Fowkes FG, Ruckley CV, et al. Prevalence of varicose veins and chronic venous insufficiency in men and women in the general population: Edinburgh Vein Study. *J Epidemiol Community Health* 1999;53:149-53.
2. Hoggan BL, Cameron AL, Maddern GJ. Systematic review of endovenous laser therapy versus surgery for the treatment of saphenous varicose veins. *Ann Vasc Surg* 2009;23:277-87.
3. Marsden G, Perry M, Kelley K, et al. Diagnosis and management of varicose veins in the legs: summary of NICE guidance. *BMJ* 2013;347:f4279.
4. Gloviczki P, Comerota AJ, Dalsing MC, et al. The care of patients with varicose veins and associated chronic venous diseases: Clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum. *J Vas Surg*. 2011;53:2S-48S.
5. Campbell B, Chinai N, Hollering P, et al. Factors influencing the choice of treatment modality for individual patients with varicose veins. *Ann R Coll Surg Engl* 2017;99:624-30.
6. Yang GK, Chen JC. Current practice in treating chronic venous disease by Canadian vascular surgeons. *Phlebology* 2019;34:414-20.
7. Kanchanabat B, Wongmahisorn Y, Stapanavatr W, et al. Clinical Presentation and Patterns of Venous Reflux in Thai Patients with Chronic Venous Insufficiency (CVI). *Eur J Vasc and Endovasc Surg* 2010;40:399-402.
8. Lee Q, Gibson K, Chan SL, et al. A comparison between Caucasian and Asian superficial venous anatomy and reflux patterns - Implications for potential precision endovenous ablation therapy. *Phlebology* 2020;35:39-45.
9. O'Flynn N, Vaughan M, Kelley K. Diagnosis and management of varicose veins in the legs: NICE guideline. *Br J Gen Pract* 2014; 64:314-5.
10. Chen H, Reames B, Wakefield TW. Management of Chronic Venous Disease and Varicose Veins in the Elderly. In: Chaer R. (Ed) *Vascular Disease in Older Adults*, 1st Ed. Cham: Springer; 2017.

Yun Le Linn ¹MRCSEd, Joshua Xianda Tan ²MBBS, Sheng Yang Lim ²MBBS, Reuban Toby D'Cruz ³MBBS, Edward Tieng Chek Choke ⁴FRCS, Tze Tec Chong ¹FACS, Tjun Yip Tang ^{1,5}FRCS

- ¹ Department of Vascular Surgery, Singapore General Hospital, Singapore
- ² Yong Loo Lin School of Medicine, National University of Singapore, Singapore
- ³ Department of General Surgery, National University Hospital, Singapore
- ⁴ Department of General Surgery, Sengkang General Hospital, Singapore
- ⁵ Duke-NUS Medical School, Singapore

Correspondence: Prof Tjun Yip Tang, Department of Vascular Surgery, Singapore General Hospital, Level 5 Academia Building, 20 College Road, Singapore 169856.
Email: tang.tjun.yip@singhealth.com.sg