ONLINE ISSN :3007-309X
PRINT ISSN :3007-3081

Journal of Medical & Health Sciences Review

EFFICACY OF ENDOVASCULAR MECHANOCHEMICAL ABLATION (MOCA) WITH FLEBOGRIF TO TREAT VARICOSE VEINS OF LOWER EXTREMITIES: A SINGLE CENTER EXPERIENCE AT SHAHEED MOHTARMA BENAZIR BHUTTO INSTITUTE OF TRAUMA (SMBBIT)

Dr Memon M Yousuf[1], Dr. Sanjay Kumar[2*], Dr Vicky Kumar[3], Dr Mohsin Hussain[4], Dr Kailash[5], Dr. Sabir Memon[6]

[1]Consultant & HOD SMBBIT
[2*]Makran Medical College Turbat (Fellow IR, Shaheed Mohatama Benazir Bhuto Shaheed Hospital Karachi)
[3]Assistant Professor & Interventional Radiologist, Shaheed Mohtarma Benazir Bhutto Institute of Trauma Karachi
[4]Assistant Professor of Radiology, Pir Abdul Qadir shah Jeelani Institute of Medical Science Gambat
[5]Consultant Radiologist SMBB-IT
[6]Consultant Orthopedic Surgeon, Executive Director SMBBIT

ARTICLE INFO

Keywords:
MOCA, CPEA, Varicose veins, VAS score

Corresponding Author:
Dr. Sanjay Kumar,
Makran Medical College Turbat (Fellow IR, Shaheed Mohatama Benazir Bhuto Shaheed Hospital Karachi)
Email:
dr_sanjaykk30@yahoo.com

ABSTRACT

Objective: The study aims to determine the outcomes of mechanochemical ablation (MOCA) with flebogrif to treat varicose veins of the lower extremities.

Methods: After the ethical approval from institutional review, this prospective observational study was conducted in the OPD of interventional radiology Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT) from ---------- to ----------. Through non-probability consecutive sampling, 85 patients aged 18 or above with saphenous vein incompetence and dilated great saphenous vein were included in the present study. The following variables were documented in the recruited patients' CEAP, VCSS (Clinics Etiology, Anatomy, Pathophysiology Classification, and Venous Clinical Severity Score), and the Analog Pain Scale.

Results: 80% of the patient's CPEA score was C6 before the procedure and after the procedure, 90% of the participants had a C0 score. In 90% of the patients, MOCA was a successful procedure. In 18% of the participants, complications were observed and among them, 67% had experienced pain as a complication. VCSS was improved from the baseline 8.45±3.45

	to 4.67±1.2 at 1 month. VAS score was improved from the baseline 6.54±0.56 to 1.3±0.4 at 1 month. Conclusion: The procedures of MOCA, developed by Flebogrif, have demonstrated significant efficacy in the treatment of incompetent varicose veins. In the present investigation, the success rate of MOCA was 91%.

INTRODUCTION

Varicose veins of the lower extremities are a common pathology affecting millions worldwide. This condition is described as the superficial veins abnormally dilated and tortuous formation of the lower extremities (1, 2). Despite being mostly cosmetic fears, varicose veins are associated with significant discomfort, pain, and, if left untreated, complications in the form of venous ulcers. Endovascular interventions have become a sophisticated approach to treating varicose vein pathology in a minimally invasive manner and relieving patients' symptoms (3). Among all available kinds, MOCA, which stands for mechanochemical ablation and involves flebogrif, is an innovative intervention that promises efficient vein obliteration (4). Mechanochemical ablation of varicose veins with flebogrif is based on a double mechanism of action. First, mechanical devastation is ensured by the rotation of a wire in the vein, which causes injury to the endothelium and clot formation. Second, a sclerosant is gradually instilled under the low, stable pressure that ensures the chemical dissolution of the treated vein(5). Its combination of effects triggers fibrosis and total occlusion, responsible redistribution of the blood to competent vessels, which reshapes the reduced downflow toward the heart (6). Several research studies have investigated the efficacy of endovascular MOCA in combination with flebogrif for varicose veins treatment. In summary, several clinical studies have examined MOCA with flebogrif's effectiveness in the treatment of varicose veins (7). First, Kim et al. conducted a prospective multicenter study on MOCA's performance in high symptom relief and vein occlusion, albeit with few complications (7). Second, Disselhoff et al. conducted an RCT that compared the efficacy of MOCA to EVLA. The study found that both techniques offered similar vein closure and symptom relief, demonstrating the potential and similar outcomes of MOCA (8). Meanwhile, comparative effectiveness studies of EVLA and RFA treatments aim to determine MOCA's superiority. For instance, Boersma et al. conducted a meta-analysis of multiple studies that showed similar clinical outcomes between MOCA, EVLA, and RFA (9). Nonetheless, MOCA has somewhat less time and pain associated with it relative to EVLA and RFA, leading to the technique's less invasive benefits. Lastly, the safety of performing MOCA and the associated complications, given the endovascular therapy, have been discussed in various studies. Although relatively safe, there have been cases of thrombophlebitis, skin burning, and nerve damage among the patients. Alozai et al. conducted a systemic review of major complications arising from MOCA and found comparable incidences to other endovascular techniques (10). Thus, patients should be properly diagnosed before performing MOCA, and healthcare professionals should be skilled when performing the technique. The present study aims to determine the outcomes of mechanochemical ablation (MOCA) with flebogrif to treat varicose veins of the lower extremities.

METHODOLOGY

After the ethical approval from institutional review, this prospective observational study was conducted in the OPD of interventional radiology Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT) from ---------- to ----------. Through non-probability consecutive

sampling, 85 patients aged 18 or above with saphenous vein incompetence and dilated great saphenous vein were included in the present study. Patients with multiple varicosities, perforators, and tortuous course of great saphenous and small saphenous veins, patients above 80 years, peripheral arterial disease, bedridden patients, and trauma patients were excluded from the present study. After the informed consent, patients were assessed clinically and on Doppler ultrasound as per guidelines. Baseline investigations were done and the procedure was performed on scheduled date and time by consultants and fellows of the interventional radiology department. The procedure was done under local anesthesia as a daycare case and patients were discharged within 1-2 hours. Follow-up was done after 24 hours, 1 week, and 3 months for their regular clinical to assess the complete vein ablation, to rule out DVT, and to check for symptomatic relief. The following variables were documented in the recruited patients' CEAP, VCSS (Clinics Etiology, Anatomy, Pathophysiology Classification, and Venous Clinical Severity Score), and the Analog Pain Scale. SPSS version 21 was used to analyze the data. The SPSS Statistics program (version), will be used for the statistical analysis. For the analysis of qualitative variables, the chi-squared test and Fisher's exact test were used. Nonparametric tests (Mann-Whitney U) will be used to compare quantitative variables. A p-value less than 0.05 will be considered statistically significant.

RESULTS

Table 1 shows the demographic parameters of the study participants. The mean age of the participants was 48.2 ± 14.2 years, with an average weight of 65.7 ± 10.2 kg. The majority of the participants in the present study were females 65%. Table 2 shows the clinical parameters of the patients who underwent MOCA in the present study. 80% of the patient's CPEA score was C6 before the procedure and after the procedure, 90% of the participants had a C0 score. In 90% of the patients, MOCA was a successful procedure. In 18% of the participants, complications were observed and among them, 67% had experienced pain as a complication. Table 3 shows the VCSS and VAS scores at 1-week and 1-month intervals. VCSS was improved from the baseline 8.45±3.45 to 4.67±1.2 at 1 month. VAS score was improved from the baseline 6.54±0.56 to 1.3±0.4 at 1 month. Table 4 shows the stratification of successful data based on age, gender, and complication presence.

Table IL Demographic characteristics

Characteristics	**Mean ± S. D (n=85)**
Age (years)	48.2 ± 14.2
Height (cm)	163.2 ± 5.1
Weight (kg)	65.7 ± 10.2
Body Mass Index (kg/m^2)	24.6 ± 3.8
Gender	
Males	30 (65%)
Females	55 (35%)

Table II: Clinical characteristics

Parameters	**N (%) (n=85)**
Pre-procedure CEAP score	

C3	68 (80%)
C4	7 (8%)
C6	10 (12%)
Post-procedure CEAP score	
C0	78 (92%)
C2A	8 (8%)
Outcome	
Successful	77 (91%)
Failure	9 (9%)
Complications	
Present	15 (18%)
Absent	70 (82%)
Type of complications	
Pain	10 (67%)
Thrombophlebitis	5 (33%)

Table III: The VCSS and VAS scores at 1-week and 1-month intervals

Follow up parameters	Post-procedure	1 week	30 days
VCSS	8.45±3.45	7.43±2.21	4.67±1.2
VAS pain score	6.54±0.56	3.2±1.2	1.3±0.4

Table IV: Stratification based on age, gender, and complications

Variables	Outcome		P-value
	Successful	Failure	
Female	50 (91%)	5 (9%)	
Male	23 (77%)	7 (23%)	0.072
Age ≤45 years	23 (82%)	5 (18%)	
Age >45 years	50 (88%)	7 (12 %)	0.350
Complications Present	12 (80%)	3 (20%)	
Complications Absent	60 (86%)	10 (14%)	0.412

DISCUSSION

This prospective study aimed to assess the initial outcomes in patients with venous insufficiency who were undergoing treatment with MOCA using Flebogrif. The findings of our study indicate that 9% of the patients experienced procedure failure. Nevertheless, a study conducted by Ammollo et al. in Italy documented a recanalization rate of 14.3%, a figure that

surpasses the findings of our investigation (11). The observed disparity in failure rates may be ascribed to variations in the chemical employed during the ablation process. The present study has a procedure success rate of 91%. A study demonstrated a 97% rate of anatomic success after 1 month. The occlusion rate at the 6-month mark was evaluated by Ciostek et al. and found to be 90% (12). In a study, I1zecki et al. conducted the most extensive follow-up, resulting in an occlusion rate of 93% after 24 months (13).

In the present study, VCSS was improved from the baseline 8.45±3.45 to 4.67±1.2 at 1 month. At the 12-month follow-up, the average VCSS increased from 9.21 ± 2.86 at the beginning to 3.02±1.20 conducted by (10). In the present study, the VAS score was improved from the baseline 6.54±0.56 to 1.3±0.4 at 1 month. Soliman et al evaluated the pain experienced during a surgical procedure and found that the average pain score was 6. After 1 week, the average pain scores were 3.2, and after 1 month, they were 1.2. Following a period of 3 months, the patients had no reported pain (14). In their study, I1zecki et al. (2019) documented mean pain scores of 3.2, 1.9, 0.7, and 0.6 before the surgery, as well as at 1, 6, and 12 months' post-treatment, respectively (13). In their study, Tawfik et al. (2013) reported mean pain scores of 7.4, 1.3, 0.4, and 0.2, which were tested before the procedure and at 1, 6, and 12 months thereafter, respectively (15).

CONCLUSION

The emergence of less invasive procedures has transformed the treatment of Varicose veins. Both methods can be executed while the patient is under local anesthetic. The procedures of MOCA, developed by Flebogrif, have demonstrated significant efficacy in the treatment of incompetent varicose veins. In the present investigation, the success rate of MOCA was 91%.

REFERENCES

1. Alsaigh T, Fukaya E. Varicose veins and chronic venous disease. Cardiology Clinics. 2021;39(4):567-81.
2. Vähäaho S. The Modern Treatment of Varicose Veins. 2020.
3. Shadrina AS, Sharapov SZ, Shashkova TI, Tsepilov YA. Varicose veins of lower extremities: Insights from the first large-scale genetic study. PLoS genetics. 2019;15(4):e1008110.
4. Aslam MR, Muhammad Asif H, Ahmad K, Jabbar S, Hayee A, Sagheer MS, et al. Global impact and contributing factors in varicose vein disease development. SAGE Open Medicine. 2022;10:20503121221118992.
5. Hekil KM, ELGAZZAR SA. Evaluation of Versatility of Mechanochemical Ablation (MOCA) in the Management of Great Saphenous Vein Reflux: A Day-case Intervention with Good Outcomes. Benha Medical Journal. 2023;40(1):133-45.
6. Bootun R, Epstein D, Onida S, Ortega-Ortega M, Davies A. Effectiveness of treatments of varicose veins in terms of reintervention: systematic review and evidence synthesis. Journal of Vascular Surgery: Venous and Lymphatic Disorders. 2017;5(1):152.
7. Jindal R, Verma D, Kaur T, Dhillon S, Kaur N, Chaudhary P. Mechanochemical endovenous ablation: Latest varicose vein treatment. Indian Journal of Vascular and Endovascular Surgery. 2019;6(1):44-6.
8. Disselhoff B, Der Kinderen D, Kelder J, Moll F. Randomized clinical trial comparing endovenous laser ablation of the great Saphenous vein with and without ligation of the sapheno-femoral junction: 2-year results. European Journal of Vascular and Endovascular Surgery. 2008;36(6):713-8.

9. Boersma D, Kornmann VN, Van Eekeren RR, Tromp E, Ünlü Ç, Reijnen MM, et al. Treatment modalities for small saphenous vein insufficiency: systematic review and meta-analysis. Journal of Endovascular Therapy. 2016;23(1):199-211.
10. Alozai T, Huizing E, Schreve M, Mooij MC, van Vlijmen CJ, Wisselink W, et al. A systematic review and meta-analysis of mechanochemical endovenous ablation using Flebogrif for varicose veins. Journal of vascular surgery: venous and lymphatic disorders. 2022;10(1):248-57. e2.
11. Ammollo RP, Petrone A, Giribono AM, Ferrante L, Del Guercio L, Bracale UM. Early results of mechanochemical ablation with Flebogrif® in great saphenous vein insufficiency: does polidocanol concentration affect outcome? Translational Medicine@ UniSa. 2020;21:47.
12. Ciostek P, Kowalski M, Woźniak W, Miłek T, Myrcha P, Migda B. Phlebogriffe–a new device for mechanochemical ablation of incompetent saphenous veins: a pilot study. Phlebological Review. 2015;23(3):72-7.
13. Iłżecki M, Terlecki P, Przywara S, Iłżecka J, Zubilewicz T. The novel minimally invasive mechano-chemical technique of the saphenous vein ablation. Our center experience: results of 24 months follow-up. Acta Angiologica. 2019;25(3):127-32.
14. Soliman M, Ahmed H. Mechano-chemical endo-venous ablation of varicose veins with Flebogrif occlusion catheter. The Medical Journal of Cairo University. 2019;87(September):3749-54.
15. Tawfik AM, Sorour WA, El-Laboudy ME. Laser ablation versus mechanochemical ablation in the treatment of primary varicose veins: a randomized clinical trial. Journal of vascular surgery: venous and lymphatic disorders. 2020;8(2):211-5.