



Surgery

TO STUDY PATTERN OF REFLUX IN PATIENTS OF VARICOSE VEINS AND ITS CORRELATION WITH CLINICAL SEVERITY OF DISEASE AND RISK FACTORS.

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ABSTRACT **Introduction:** The Present study was done to see the pattern of reflux in patients of varicose veins and its correlation with clinical severity of disease and risk factors.

Methods: The prospective study included 100 patients of varicose veins, evaluated clinically for presence of risk factors and the reflux pattern was studied using colour doppler. Clinical status was characterized by the CEAP classification. The clinical severity was grouped into two categories, mild to moderate CVI (C1–C3) and severe CVI (C4–C6). The pattern of reflux and its correlation with severity of disease and risk factors was studied.

Observations: The most common risk factor in females was previous pregnancy, while in males it was prolonged standing. Increasing age was found to be associated with clinically more severe form (C4–C6) of disease. Majority of cases (74%) had mild to moderate CVI. Most common pattern of reflux found was Saphenofemoral Junction (SFJ) incompetence in 70% cases. It was found that presence of combined SFJ and SPJ reflux increased the chances of severe disease by 1.94 times when compared with isolated SFJ reflux. There was statistically significant correlation between long duration of standing with deep venous reflux and further development of a severe degree of CVI.

Conclusion: Prolonged standing was found to increase the chances of deep venous reflux which was in turn correlated with a severe form of CVI. Old age was also associated with a severe form of disease.

KEYWORDS : Varicose veins, CEAP classification, SFJ incompetence, SPJ incompetence, Deep venous reflux.

Introduction:

Varicose veins are dilated, elongated and tortuous veins which occur in several locations of body.¹ It is estimated that at least 10% of the world's population has varicose vein in the lower extremities.² Varicose veins, although often quite large, can have a varying degree of symptomatology and are often associated with one or multiple sources of reflux. On history and physical examination, one can determine that they are symptomatic and progressive. Edema, if venous in origin, is another indication for treatment of venous insufficiency. The basic aim of clinical evaluation is to localize the problem whether the deep system is involved or superficial system is involved. Duplex technology more precisely defines the veins which are refluxing, by imaging the superficial and deep veins. Most studies have focused on saphenofemoral junction (SFJ) or the saphenopopliteal junction (SPJ) alone however, reflux present in deep venous system plays an important role in clinical severity of the disease. Authors have studied pattern of reflux and its correlation with clinical severity of disease and risk factors in 100 patients of varicose veins.

Material and methods

The study was conducted in 100 patients of primary varicose veins attending Outpatient Department of Surgery and Venous disease clinic of our Institute from January 2014 to December 2015. The patients having Deep Venous Thrombosis (DVT), Superficial Thrombophlebitis and Recurrent Varicose Veins after surgery were excluded from the study. In all the patients, a detailed history was taken with special focus on risk factors and characteristic symptoms of chronic venous insufficiency (CVI). Pattern of varicosity was recorded whether it involved superficial venous system or deep venous system by clinical examination and Color duplex ultrasound. Clinical severity

of the disease in a given patient was assessed by standard Clinical, Etiological, Anatomical, and Pathological (CEAP) classification as recommended by the Society for vascular Surgery. The degree of clinical severity was grouped into two categories, mild to moderate CVI (C1–C3) and severe CVI (C4–C6).

Color doppler was performed in standing position to know the reflux at saphenofemoral junction, saphenopopliteal junction and various incompetent perforators in the lower limb.

Reflux in deep venous system was assessed at following three sites:

1. Common femoral vein in the groin.
2. Popliteal vein in the popliteal fossa.
3. Gastrocnemius vein – popliteal vein junction (GPJ) in the popliteal fossa.

Reflux was defined as flow in an inverse direction to physiological flow with a duration greater than 0.5 seconds after provocation maneuvers (Valsalva and distal compression-release).

Statistical analysis: Data was tabulated and analyzed statistically using chi square and odd's ratio to study the pattern of reflux and its correlation with clinical severity of disease and risk factors. Statistical analysis was conducted using the statistical package SPSS 9.

Observations

The main observations of the study were as under:

Demography: Majority of patients were between 21–40 years of age, mean age was 36.8 years. Bilateral involvement of lower limb was

most common (39%) followed by left sided involvement in 35% cases. Right side was involved in 26% of cases. Maximum number of patients (67%) presented with symptoms of two years duration. The most common risk factor in females was previous pregnancy, however increasing parity, as risk factor was statistically insignificant. Most common risk factor in males was prolonged standing occupation.

The CEAP classes distributed were as follows: C1=2 cases, C2=60 cases, C3=12, C4=7, C5 and C6=19. Clinical severity was grouped into mild to moderate CVI (C1-C3) and severe CVI (C4-C6). Majority of cases (74%) were having mild to moderate CVI and severe CVI was found in 26% of cases. In our study it was found that as the mean age increases, chances of more severe form of CVI (C4-C6) increases (Table-1).

Pattern of reflux: Most common pattern of reflux found was Sapheno Femoral Junction (SFJ) Incompetence in 70% cases. Perforators were found to be involved in 81% of cases along with superficial and deep vein incompetence. Isolated perforator incompetence was found in 18% of the cases. Average number of perforators were less than 3 perforator in 48% of cases. Deep venous incompetence was found in 25% of cases and almost all had associated superficial venous incompetence. It was found that presence of combined SFJ and SPJ reflux increases the chances of having severe form of disease by 1.94 times when compared with having SFJ reflux only (Table-2). Presence of Deep venous reflux increases the chances of development of severe form of CVI (C4-C6) and it was found to be statistically highly significant (p value=0.000) in this study (Table-3).

Risk factors: It was observed that Obesity and family history of varicose veins increases chances of development of severe form of CVI (C4-C6) by 1.9 and 1.2 times respectively, however it was not found to be statistically significant (p value>0.05). History of previous pregnancy has more likelihood of having mild to moderate CVI (C1-C3) as per CEAP classification but it was also not statistically significant (p value >0.05). History of prolonged standing increases chances of having deep venous reflux and it was found to be statistically significant (p value <0.05) (Table-4).

Discussion

The study was conducted in 100 patients of primary varicose veins. In literature, the age distribution of varicose veins in most of studies varied from 30-40 years.³ But a few studies reported higher mean age of presentation.⁴ In present study also mean age was 36.8 and this may be because of more younger adults who are bread earners for their families and they are the ones who are more prone to develop the varicose veins. In the present study bilateral (39%) side involvement was most commonly seen followed by left (35%) lower limb. In the literature there is variable presentation of right and left side involvement with most of studies reporting left side predominance of disease while a few have right side predominance. Vashist et al have also found a higher incidence of left side involvement, left side was involved in 42% cases while right side was involved in 38% cases, bilateral involvement was observed in 20% cases.⁵ Hauer et al reported left side involvement in 35%, right side in 19% and bilateral involvement in 46% of the patients.⁶ In our study, like others existing in literature left sided limb involvement was more common than right side. As hypothesized in the past, this could be related to the left iliac artery crossing the left iliac vein.⁷

In the present study, maximum number of patients (67%) were having duration of symptoms less than five years. Vashist et al in their study had majority of patients (82%) with symptoms of less than 3 years of duration.⁵ Bountourglou et al and Wright et al in their study had majority of patients with symptoms of less than 2 and 5 years of duration respectively.^{8,9}

In present study, 74% of patients were in C1-C3 severity and 26% of patients were having C4-C6 severity of varicose veins. Allegra et al in their study involving 1326 limbs had 68.5% of patients in C1-C3 severity and 31.5% for C4-C6 severity of varicose veins¹⁰. Gimeno et al studied 2036 patients and found 86.8% of patients in mild to moderate CVI and 13.2% in severe CVI.¹¹ Bradbury et al studied 428 patients, where 84.8% reported mild to moderate CVI and 15.2% reported severe CVI.¹² In the mild to moderate group maximum number of patients (60%) were belonging to C2 severity in present study. Gimeno et al found that most frequent clinical class was that of the varicose

veins C2 class in 97.7% cases.¹¹

In the present study the sapheno femoral junction (SFJ) was found to be incompetent in 70% of patients. Study done by Irodi et al found SFJ incompetence in 92% of patients.¹³ Wong et al concluded that SFJ incompetence predominated in extremities with primary and recurrent varicose veins.¹⁴ In the literature, a variable percentage of deep venous reflux has been quoted ranging from 35.3% in limbs with primary chronic venous insufficiency and in 92.3% of limbs with post-thrombotic chronic venous insufficiency of limbs with venous ulcer, 55% in another series of patients with venous ulcer.¹⁵⁻¹⁷ In present study deep venous reflux was seen in 25% of cases and it was found to increase frequency of severe form of CVI by 21.53 times and it was also found to be statistically significant (p value=0.023). In the present study it was observed that when reflux was present in GSV (SFJ incompetence) there was a greater probability that the patient would be in severe CVI group (C4-C6), and when the reflux in the SSV (SPJ incompetence) was added with GSV reflux the chances of having more severe form of clinical severity (C4-C6) increased 1.94 times. However, it was not found to be statistically significant (p value >0.05). Gimeno et al observed that when reflux was present in the GSV segments above and below the knee, there was a greater probability that the patient would be in the CEAP C4-C6 category, and when the reflux in the SSV segment was added to this combination, the likelihood of having a more severe clinical level increased 2.6 times.¹¹ We also found that prolonged standing increases chances of developing severe form of disease (C4-C6) by 6.84 times compared to mild to moderate form (C1-C3) and also prolonged standing was found to have higher chances of having deep venous reflux as compared to other pattern of refluxes i.e SFJ, SPJ and perforator incompetence. Jiang et al reported that deep venous incompetence was common in series of patients with long-standing disease.¹⁸

In present study it was found that obesity increased 1.96 times the frequency of suffering from a severe form of CVI than mild to moderate CVI. Padburg et al reported that morbid obesity type III should be considered the greatest factor contributing to severe CVI.¹⁹ Gimeno et al reported that symptomatic patients were found 2.3 times more often in severe CVI group than in the mild to moderate CVI.¹¹ Careful examination of some of these epidemiologic studies shows that when the patient's age is correlated with obesity, the statistical significance is eliminated and so control of obesity is important factor to be considered to prevent development of chronic venous insufficiency and its complications.

In present study 93.75% females had history of previous pregnancy. Boivin et al reported that pregnancy may act as a risk factor for the development of varicose veins in predisposed women.²⁰ Sparey et al found that normal veins, in spite of changes in venous diameter during pregnancy, return to normal after delivery, but some varicose veins deteriorate during pregnancy, and this may be progressive with successive pregnancies.²¹ Cornu-Thenard et al also observed a correlation between the total number of pregnancies and size of varicose veins.²² Gimeno et al had reported in their study that 60% of women had a history of pregnancy; however, their presence was associated with mild to moderate CVI (C1-C3).¹¹ So it was concluded that pregnancy is an important risk factor in development of varicose veins and further studies are necessary to evaluate the influence of successive pregnancies on the development of varicose veins and the capacity of compression treatment to reduce progression of this disease.

In present study 58.8% of males were have history of prolonged standing. Commonly it is noted that occupations that require standing for prolonged periods have an increased incidence of varicose veins. Abramson et al in a community-based study of varicose veins conducted in Jerusalem among men and women aged 20 to 64 years, found that the prevalence of varicose veins was significantly higher among subjects who reported that they spent much of the work day standing.²³ Gourgou et al reported that CVI cases were 2.7 times more likely to report on the standing job for greater than 4 hours per day compared with controls after adjustment for physical activity, family history, smoking, alcohol abuse, and exposure to heat.²⁴

CONCLUSION

In the present study, it was concluded that commonest pattern of reflux was SFJ incompetence. Prolonged standing in males and previous

pregnancy in females were the commonest predisposing factors. History of prolonged standing increases the chances of deep venous reflux. Presence of deep venous reflux increases the chances of having severe form (C4-C6) of disease. Increasing age is associated with clinically more severe form (C4-C6) of disease.

Table no.1-Relation of mean age with clinical severity

Clinical severity	Number of patients	Mean age (yrs)	P value
Mild to moderate CVI (C1-C3)	74	33.97 yrs	P=0.001
Severe CVI (C4-C6)	26	45.15 yrs	

Table No.2-Comparison of SFJ, SFJ+SPJ With Clinical Severity

Pattern of reflux	Mild to moderate CVI (C1-C3)	Severe CVI (C4-C6)	Odds ratio (OR)	95% CI	P value
SFJ incompetence	50	20	1.94	0.637-5.93	0.242
SFJ+SPJ incompetence	9	7			

Table no.3-Relationship of the reflux pattern with clinical severity

Pattern of reflux	CEAP (C ₁ -C ₃)	CEAP (C ₄ -C ₆)	OR	95% CI	P value
SFJ incompetence	50(71.4%)	20(28.6%)	1.6	.57-4.5	0.373
SPJ incompetence	19(65.5%)	10(34.5%)	1.81	.702-4.66	0.219
Perforators	58(71.6%)	23(28.4%)	2.115	.56-7.95	0.267
Deep venous reflux	7(28%)	18(72%)	21.53	6.8-67.3	<0.001

Table no.4-Relationship between risk factors with clinical severity CEAP classification

Risk factors	CEAP (C ₁ -C ₃)%	CEAP (C ₄ -C ₆)%	ODD'S RATIO (OR)	95% CI	P value
Pregnancy	25 (33.8%)	5 (19.2%)	0.467	.157-1.385	0.169
Obesity	8 (61.6%)	5 (38.5%)	1.964	.580 – 6.65	0.278
family history	12 (70.6%)	5 (29.4%)	1.23	.388 – 3.9	0.725
hormonal therapy	2 (2.7%)	1 (3.8%)	1.440	.125-16.57	0.769
prolonged standing	21 (52.5%)	19 (47.5%)	6.84	2.51 – 18.68	0.0002

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