



## POST OPERATIVE OUTCOME OF VARICOSE VEIN SURGERY WITH SPECIAL REFERENCE TO SAPHENOFEMORAL LIGATION WITHOUT STRIPPING OF GREAT SAPHENOUS VEIN

### General Surgery

<b>Anirban Bhunia</b>	Junior Resident, Department of General Surgery, Burdwan Medical College and Hospital(BMCH)
<b>Kaushik Mandal*</b>	Associate Professor, Department of General Surgery, BMCH* Corresponding Author
<b>Mohan Kumar Das</b>	Assistant Professor, Department of General Surgery, BMCH
<b>Debarshi Jana</b>	Young Scientist (DST), IPGMER, Kolkata

### ABSTRACT

Varicose veins are common medical condition and change in the pattern of work in recent times in the society has increased the incidence of varicose veins. To evaluate the outcome of the procedure in terms of post-operative recovery by studying various factors (pain, hematoma, post op. neuralgia etc.). The proposed study will be conducted in BMCH over a period of 1 year & 6 months (March 2018 to August 2019). The patients, attending general surgery OPD and emergency for varicosity of GSV (with saphenofemoral junction incompetence, with or without perforator incompetence) and fulfilling the inclusion criteria will be studied and required investigations will be done. A total 35 patients were subjected to routine duplex scanning and depending upon the report were operated. Saphenofemoral ligation without stripping was done in all cases with phlebectomy for perforators was done in 31 patients. At 3 months 7 patients were lost to follow up, 26 patients had better quality of life, majority of them had reduction of symptoms and achieved a satisfactory cosmetic appeal, 1 had neuralgia and 2 had recurrence of symptoms. Most of them had an average 3 days post-operative stay with uneventful recovery. Swelling along the veins is the most common presenting symptom. Venous edema is the most common complication. Surgery improves the quality of life, reduces symptoms and is associated with lesser complications. SFJ ligation without stripping with phlebectomy of perforators is an easy and efficient way to treat varicosities and has a very good cosmetic appeal and satisfactory results, both to the patient and the surgeon.

### KEYWORDS

Varicose Vein, Saphenofemoral Ligation, Saphenous Vein

### INTRODUCTION

“Varicosity is the verticality against gravity 1”. Change in the pattern of work in recent times in the society has increased the incidence of varicose veins 2. It affects 10-20% of the population 3 in the western world but in developing countries, the incidence is about 2% with less than 1% have or had skin changes including various complications 4, which can be prevented by minor modifications in the work pattern and life style. Moreover, with increasing population, increased life span and change in life style the problem is ever growing. Various predisposing factors have been implicated like pregnancy, prolonged standing, obesity, old age, athletics etc. but heredity also plays important role. In varicose veins, the problem may lie in superficial veins, deep veins or in the perforator veins 5.

Varicose veins range in severity from telangiectasia to protuberant superficial varicose veins with or without oedema, dermatitis, lipodermatosclerosis and venous ulceration 6. It is accepted that surgical treatment is required for symptomatic varicose veins, to relieve symptoms and to prevent the long-term sequel of varicose eczema, lipodermatosclerosis and venous ulceration. The aim of treatment is to obtain an acceptable result in terms of cosmetics and relieve the patient's complaints with low complications and recurrence rates. Different surgical interventions may be used to treat varicose veins, but most preferred treatment method applied still is “saphenofemoral high ligation along with great saphenous vein (GSV) upper segment stripping and phlebectomy” in different treatment methods. Microphlebectomy or phlebectomy is a newer technique where multiple stabs are made in the skin through which varicose veins are removed.

Stripping methods may have some negative results such as haemorrhage, pain, wound infection, discomfort and long hospitalisation. Another aspect to be considered is that non-stripping of the GSV may reduce lymphatic lesions and saphenous nerve damage, resulting in lower risk of alterations in the lymphatic network and nervous system following varicose vein surgery. Non-ablation of the GSV may also reduce the occurrence of hematoma. Stripping is also known to be associated with post-operative neuralgia 7 due to saphenous nerve injury and lymphatic lesions.

Taking into consideration the above-mentioned facts, preservation of the GSV has been recommended whenever a surgical intervention is indicated in the treatment of primary varicose veins of the lower limbs.

The autologous GSV is the most effective bypass choice for lower limb revascularization, can also be used in myocardial revascularization, as arterial and venous bypass in extremity vascular trauma. In the clinical practice of varicose vein surgery, preservation of the GSV is a desirable objective whenever the vein remains healthy at clinical examination. But reoperation risk is much lower with stripping due to less common recurrence.

Our study is designed to find out a satisfactory method of varicose vein surgery with special reference to SFJ ligation without stripping of GSV.

### METHOD

Patients undergoing saphenofemoral ligation without stripping of long saphenous vein as part of surgical management of varicose vein in BMCH from March 2018 to August 2019. 35 Patients fulfilling inclusion criteria were allotted in any study group and those are not fulfilling the criteria were excluded from the study.

Patients of varicose vein undergoing saphenofemoral ligation without stripping of GSV as definitive surgical management were included in this study. Permission from Institutional Ethics Committee was taken. Written informed consent was obtained from all participating patients.

The purpose of the study is to evaluate the patients after surgery to assess the outcome of Saphenofemoral ligation without stripping of GSV with respect to the effect on residual GSV symptomatic and cosmetic outcome.

Post-operative outcome were studied in terms of stay duration, pain, hematoma, infection, post-operative neuralgia, and post-operative oedema individually and in relation to different characteristics of the population. It was recorded on the day before surgery, post-operative day 1, post-operative day 3, at the time of discharge, 2 weeks following surgery, 1 month following surgery and 3 months following surgery.

- All consenting clinically diagnosed cases of symptomatic or complicated primary lower limb varicose veins with saphenofemoral incompetence (with or without perforator incompetence) undergoing the procedure. [Saphenofemoral ligation without long saphenous vein stripping + phlebectomy of perforators]
- Patients in the age group of 18-60 years of both genders

undergoing varicose vein surgery (Saphenofemoral ligation without stripping of great saphenous vein) in BMCH during the study period and not having any of the exclusion criteria.

### STATISTICAL ANALYSIS PLAN

The data was analysed with the help of computer software Epi-info version 6.0.1 and SPSS 20.0 for windows. Chi square test was used to ascertain statistical significance among the proportions. Incidence along with 95% confidence limits was calculated to express magnitude. Mean & standard deviation was worked out to assess the recovery time. Proportions were calculated to assess the qualitative outcomes to compare the outcome by characteristics of the subjects.

### RESULT

We found that the mean age (mean±s.d.) of patients was 35.8571±10.5723.

It was found that 14(40.0%) patients had ≤30 years of age, 11(31.4%) patients had 31 to 40 years of age, 5(14.3%) patients had 41 to 50 years of age and 5(14.5%) patients had 51 to 60 years of age.

Our study showed that 4(11.4%) patients had female and 31(88.6%) patients had male.

It was found that 5(14.5%) patients had business, 3(8.6%) patients had day labour, 11(31.4%) patients had farmer, 1(2.9%) patient had guard, 2(5.7%) patients had housewife, 4(11.4%) patients had police, 1(2.9%) patient had singer, 1(2.9%) patient had sportsman, 3(8.6%) patients had student and 4(11.4%) patients had teacher.

We found that 19(54.3%) patients had left side and 16(45.7%) patients had right side.

Our study found that 35(100.0%) patients had swelling along the veins. Our study showed that 31(88.6%) patients had pain/cramps. Our study found that 11(31.4%) patients had skin changes. Our study showed that 2(5.7%) patients had ulcer. Our study found that 35(100.0%) patients had no haemorrhage.

We found that 11(31.4%) patients had pigmentation. Our study found that 12(34.3%) patients had venous edema. It was found that 3(8.6%) patients had dermatitis. We found that 3(8.6%) patients had thrombophlebitis. Our study found that 35(100.0%) patients had SFJJ.

Our study found that 31(88.6%) patients had PI (below knee). Our study showed that 35(100.0%) patients had SFJ ligation without stripping.

Our study found that 31(88.6%) patients had phlebectomy/ stab avulsion.

We found that 20(57.1%) patients had 3 days post-op hospital stay, 8(22.9%) patients had 4 days post-op hospital stay, 5(14.3%) patients had 5 days post-op hospital stay and 2(5.7%) patients had 6 days post-op hospital stay.

It was found that 5(14.3%) patients had haematoma. Our study found that 9(25.7%) patients had seroma. It was found that 5(14.3%) patients had surgical site abscess.

Our study showed that 4(11.4%) patients had neuralgia.

We found that 7(10.0%) patients had D symptoms post-op, 7(10.0%) patients had L symptoms post-op, 52(74.3%) patients had R symptoms post-op and 4(5.7%) patients had symptoms post-op.

Our study showed that in follow up at 2 weeks, 28(80.0%) patients had Better quality of life, 6(17.1%) patients had Same quality of life and 1(2.9%) patient had Worse quality of life. In follow up at 1 month, 28(80.0%) patients had Better quality of life, 6(17.1%) patients had Same quality of life and 1(2.9%) patient had Worse quality of life. In follow up at 3 months, 26(74.3%) patients had Better quality of life, 7(20.0%) patients had Lost in follow-up and 2(5.7%) patients had Same quality of life. Association of quality of life vs. group was statistically significant (p=0.0080).

We found that in follow up at 2 weeks, 7(20.0%) patients had 2

cosmetic appeal and 28(80.0%) patients had 3 cosmetic appeals. In follow up at 1 month, 7(20.0%) patients had 2 cosmetic appeal, 27(77.1%) patients had 3 cosmetic appeals and 1(2.9%) patient had 4 cosmetic appeal. In follow up at 3 months, 7(20.0%) patients had lost in follow up, 2(5.7%) patients had 2 cosmetic appeal, 12(34.3%) patients had 3 cosmetic appeals and 14(40.0%) patient had 4 cosmetic appeal. Association of cosmetic appeal vs. group was statistically significant (p<0.001).

It was found that in follow up at 2 weeks, 35(100.0%) patients had no dilated veins. In follow up at 1 month, 35(100.0%) patients had no dilated veins. In follow up at 3 months, 2(5.7%) patients had dilated veins. Association of dilated veins vs. group was statistically significant (p=0.0006)

Our study showed that in follow up at 2 weeks, 15(42.9%) patients had pain on walking. In follow up at 1 month, 7(20.0%) patients had pain on walking. In follow up at 3 months, 3(8.6%) patients had pain on walking. Association of pain on walking vs. group was statistically significant (p=0.0001)

We found that in follow up at 2 weeks, 11(31.4%) patients had skin changes. In follow up at 1 month, 11(31.4%) patients had skin changes. In follow up at 3 months, 6(17.1%) patients had skin changes. Association of skin changes vs. group was statistically significant (p=0.0032).

It was found that in follow up at 2 weeks, 8(77.1%) patients had oedema. In follow up at 1 month, 35(100.0%) patients had no oedema. In follow up at 3 months, 7(20.0%) patients had loss to FU and 28(80.0%) patients had no oedema. Association of oedema vs. group was statistically significant (p<0.001).

We found that in follow up at 2 weeks, 2(5.7%) patients had ulceration. In follow up at 1 month, 2(5.7%) patients had ulceration. In follow up at 3 months, 7(20.0%) patients had loss to FU and 28(80.0%) patients had no ulceration. Association of ulceration vs. group was statistically significant (p=0.0024).

It was found that association of complications vs. group was statistically significant (p=0.0498).

We found that in follow up at 2 weeks, 35(100.0%) patients had no recurrence. In follow up at 1 month, 1(2.9%) patient had recurrence. In follow up at 3 months, 2(5.7%) patients had recurrence. Association of recurrence vs. group was statistically significant (p=0.0015)

### DISCUSSION

Varicose veins and their treatment have been commented upon since antiquity<sup>8</sup>. Although the surgical treatment of ligation and stripping of the greater saphenous veins has been fairly standard for nearly the last 100 years, more recent studies have questioned this approach<sup>9</sup>. It is the purpose of this study is to review the pathophysiology, diagnosis, surgical treatment of varicose veins, and their outcomes.

In 1978 Widmer reported data from a defined population of factory workers<sup>10</sup>. He found a higher incidence of varicose veins in men (5.2%) than in women (3.2%), with the overall incidence of varicose veins being 4.2%. The prevalence of venous disease increases with age<sup>11</sup>.

The present study had 4 (11.4%) female patients rest all (88.6%) were males showcasing 8 time increase in incidence among men. This is not so when compared to other international studies. According to the literature, females are affected twice more common as compared to males<sup>12</sup>. The predominance of males in our study may be due to male-dominant society; more males turned up for the treatment. Females being either less health conscious or being neglected by the families in rural India reported less for treatment. The Basle Survey has also reported a male to female preponderance.

Goren and Yelling in a study intended to classify the clinical appearance of uncomplicated varicose veins, found that 71% of the limbs studied demonstrated typical saphenous vein varicosities. Of the 164 limbs, 147 demonstrated great saphenous vein incompetence, whereas only 17 limbs showed small saphenous vein incompetence. Only 22% of limbs did not show saphenous vein incompetence: these showed isolated perforating vein incompetence<sup>13</sup>.

In our study saphenous system (GSV / SSV) was involved in all patients, the perforating veins were involved in isolation in 88.6% patients (in combination with GSV). Going further, the saphenous system, which comprises of the great and short saphenous system was involved in all patients. Both of them together were involved in 31(88.6%)limbs. Analysing the above data we derive that the great saphenous system is the most commonly involved (100%), the communication system is the next commonest (88.6%). The small saphenous is the least involved system.

In the present study all the patients complained of dilated and tortuous veins followed by pain during walking. Pain, often mid aching pain was the next common (88.6%) symptom and usually the factor responsible for making the patient seek medical attention, whereas skin changes of the affected limb was seen in 11 (31.4%) and ulcer in 2(5.7%) of the limbs. Cosmetic factor was most commonly responsible for these asymptomatic patients to come to the hospital.

Varicose veins are known for their complications which can be dangerous as in haemorrhage or can usually be disfiguring cosmetically unappealing venous edema, lipodermatosclerosis, pigmentation, equinus deformity, thrombophlebitis, dermatitis). In this study venous edema of the affected limb was the most common complication (34.3%) followed by pigmentation (31.4%) dermatitis (8.6%) and thrombophlebitis (8.6%). There was a nil incidence of haemorrhage in the study population.

In the study Trendelenburg's operation with stripping of CSV accompanied by perforator ligation and stab avulsion was the most common procedure performed. It was done for 31(88.6%) limbs. This is due to the fact that the SFJ and GSV are the most commonly involved junction and system respectively. and hence warrant surgical intervention more frequently.

Maximum patients, 20 (57.1%) had 3days post-operative hospital stay. Thus, duration of post-operative stay was minimal in the present procedure.

Surgical outcomes were collected at predetermined intervals, and were sorted as those recorded before the discharge of the patient, at 2 weeks, 1 month and at 3 months. Patients were interviewed. a detailed history taking, thorough examination performed and relevant investigations done in each stage. The results were divided into complications, quality of life and resolution of pre-operative symptoms. Each was scored and then graded, so as to form different categories. Early post-operative complications such as hematoma, seroma and wound infection were looked into when the patient was still admitted in the wards. Follow up regarding quality of life was graded as better, same or worse by the patient himself. Similar grading of resolution of pre-operative symptoms was as disappeared, reduced, same or worse, was done by the patient. Complications were keenly searched for, observed, recorded and followed up during each visit. Results were categorised for each limb separately.

Attrition or loss of patients to follow up, is a known phenomenon. In this study during the first follow up period at 3 months 7(20%) were lost to follow up. The remaining 28 (%) were followed up as described earlier. The probable reason behind this could be explained by the fact that the study population was mainly comprised of daily wage workers hailing from a low socio-economic strata of the society. Reporting for follow up would mean loss of daily wages. Other plausible explanation could be disappearance of symptoms preventing the patient from reporting for follow up. Other known causes for attrition like death, change of address etc are also responsible.

This parameter was assessed at intervals of 2 weeks, 1 month & 3 months. In follow up at 2 weeks, 28(80.0%) patients had better quality of life, 6(17.1%) patients had same quality of life and 1(2.9%) patient had worse quality of life. In follow up at 1 month, 28(80.0%) patients had better quality of life, 6(17.1%) patients had same quality of life and 1(2.9%) patient had worse quality of life. In follow up at 3 months, 26(74.3%) patients had better quality of life, 7(20.0%) patients lost to follow-up and 2(5.7%) patients had same quality of life. None of patients who followed up to 3 months showed worsening of quality of life.

Swelling along the veins subsided quickly at 2 weeks, there was no

evidence of any venous prominence at follow up of 1 month, but 2 (5.7%) developed swelling along the vein again at follow up of 3 months.

At follow-up of 2 weeks, 15 (42.9%) patients had persistence of pain on walking, of them pain persisted for 7 (20%) on follow-up at 1 month. At follow-up of 3 months only 3 (8.6%) of them presented with the pain. Most of the patients could walk without pain/discomfort post-surgery.

Only 8 (22.9%) patients presented with venous edema at follow-up of 2 weeks. None of them had this complain on further follow-ups.

It was observed that 2 (5.7%) patients still had venous ulcers at follow-ups of 2 weeks & 1 months, which healed at follow up of 3 months.

Skin pigmentation was the only symptom to persist even at 3 months of follow-up for 6 (17.1%) patients.

None complained of symptoms of same intensity, and none had worsening of their symptoms at 3months follow-up. As mentioned earlier the most common symptom of pain is due to the venous reflux, hence surgical treatment of reflux causes marked improvement of symptoms.

The complications looked for were persistent oozing, stitch abscess, neuralgia, thrombophlebitis and recurrence.

- In follow up at 2 weeks; 4 patients had wound infection, 1 had oozing, 1 had both oozing and wound infection, only 1 had neuralgia, 28 patients did not have any complications.
- In follow up at 1 month; 2 patients had oozing & 2 had wound infection, 1 had both the complications, 1 had neuralgia.
- But at 3 months follow up, 2 had wound infection, only 1 had neuralgia, rest 25 did not have any complications.
- As stripping of GSV was not a part of the present surgical procedure, neuralgia was least common complication here. It is associated with stripping of the GSV and more so when the stripping is performed below knee. it occurs due to the inadvertent injury to saphenous nerve while stripping below knee. Most of them had uneventful recovery.

This is an easy to perform procedure done either in addition to other surgeries or for small branch tributary varicosities and recurrent residual cases. Consumes very less time and requires less expertise. Can be performed in a very small incision hence is associated with faster recovery.

In the present study all the patients were enquired about the cosmetic appeal of the stab avulsions, majority (74.3%) of them answered positively. Maximum (74.3%) patients had achieved a satisfactory cosmetic appeal after their surgery.

On our colour doppler study, SFJ reflux was observed in 2 patients at the follow up of 3 months. The deep venous system was normal in all patients. So that, 2(5.7%) of them developed recurrence after their surgery.

**Conclusion**

It is concluded from the present study that varicose vein with saphenofemoral insufficiency and perforator insufficiency (below knee) should be treated with saphenofemoral junction flush ligation (without stripping) and phlebectomy of perforators, as this is associated with low complication rate and satisfactory outcome.

**Table:1 Association of Quality of life, Cosmetic appeal and Dilated Veins with groups**

		Follow up at 2 weeks	Follow up at 1 months	Follow up at 3 months	TOTAL	Chi-square value	p-value
Quality of life	B	28	28	26	82	17.3833	0.0080
	Row %	34.1	34.1	31.7	100.0		
	Col %	80.0	80.0	74.3	78.1		
	L	0	0	7	7		
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		

Cosmetic appeal	S	6	6	2	14	48.7190	<0.001
	Row %	42.9	42.9	14.3	100.0		
	Col %	17.1	17.1	5.7	13.3		
	W	1	1	0	2		
	Row %	50.0	50.0	0.0	100.0		
	Col %	2.9	2.9	0.0	1.9		
TOTAL	35	35	35	105			
Row %	33.3	33.3	33.3	100.0			
Col %	100.0	100.0	100.0	100.0			
Dilated Veins	L	0	0	7	7	19.6875	0.0006
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		
	2	7	7	2	16		
	Row %	100.0	100.0	14.3	100.0		
	Col %	20.0	20.0	5.7	15.2		
3	28	27	12	67			
Row %	34.1	40.3	17.9	100.0			
Col %	80.0	77.1	34.3	63.8			
4	0	1	14	15			
Row %	0.0	50.0	93.3	100.0			
Col %	0.0	2.9	40.0	14.3			
TOTAL	35	35	35	105			
Row %	33.3	33.3	33.3	100.0			
Col %	100.0	100.0	100.0	100.0			

**Table: Association of Pain on walking, Skin Changes and Oedema with groups**

		Follow up at 2 weeks	Follow up at 1 months	Follow up at 3 months	TOTAL	Chi-square value	p-value
Pain on walking	LOSS TO FU	0	0	7	7	24.3025	0.0001
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		
	NO	20	28	25	73		
	Row %	27.4	38.4	34.2	100.0		
	Col %	57.1	80.0	71.4	69.5		
YES	15	7	3	25			
Row %	60.0	28.0	12.0	100.0			
Col %	42.9	20.0	8.6	23.8			
TOTAL	35	35	35	105			
Row %	33.3	33.3	33.3	100.0			
Col %	100.0	100.0	100.0	100.0			

Skin Changes	LOSS TO FU	0	0	7	7	15.9000	0.0032
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		
	NO	24	24	22	70		
Row %	34.3	34.3	31.4	100.0			
Col %	68.6	68.6	62.9	66.7			
YES	11	11	6	28			
Row %	39.3	39.3	21.4	100.0			
Col %	31.4	31.4	17.1	26.7			
TOTAL	35	35	35	105			
Row %	33.3	33.3	33.3	100.0			
Col %	100.0	100.0	100.0	100.0			
Oedema	LOSS TO FU	0	0	7	7	31.2667	<0.001
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		
	NO	27	35	28	90		
Row %	30.0	38.9	31.1	100.0			
Col %	77.1	100.0	80.0	85.7			
YES	8	0	0	8			
Row %	100.0	0.0	0.0	100.0			
Col %	22.9	0.0	0.0	7.6			
TOTAL	35	35	35	105			
Row %	33.3	33.3	33.3	100.0			
Col %	100.0	100.0	100.0	100.0			

**Table: Association of Ulceration, Complications and Recurrence with groups**

		Follow up at 2 weeks	Follow up at 1 months	Follow up at 3 months	TOTAL	Chi-square value	p-value
Ulceration	LOSS TO FU	0	0	7	7	16.5319	0.0024
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		
	NO	33	33	28	94		
Row %	35.1	35.1	29.8	100.0			
Col %	94.3	94.3	80.0	89.5			
YES	2	2	0	4			
Row %	50.0	50.0	0.0	100.0			
Col %	5.7	5.7	0.0	3.8			
TOTAL	35	35	35	105			
Row %	33.3	33.3	33.3	100.0			
Col %	100.0	100.0	100.0	100.0			
Complications	L	0	0	7	7	18.3171	0.0498
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		
	Neuralgia	1	1	1	3		
Row %	33.3	33.3	33.3	100.0			
Col %	2.9	2.9	2.9	2.9			
None	28	29	25	82			
Row %	29.8	35.4	30.5	100.0			
Col %	80.0	82.9	71.4	78.1			
Oozing	1	2	0	3			
Row %	33.3	66.7	0.0	100.0			
Col %	2.9	5.7	0.0	2.9			
Oozing & Wound infection	1	1	0	2			
Row %	33.3	33.3	0.0	100.0			
Col %	2.9	2.9	0.0	1.9			
Wound infection	4	2	2	8			
Row %	50.0	25.0	25.0	100.0			
Col %	11.4	5.7	5.7	7.6			
Recurrence	LOSS TO FU	0	0	7	7	17.5368	0.0015
	Row %	0.0	0.0	100.0	100.0		
	Col %	0.0	0.0	20.0	6.7		

	NO	35	34	26	95		
	Row %	36.8	35.8	27.4	100.0		
	Col %	100.0	97.1	74.3	90.5		
	YES	0	1	2	3		
	Row %	0.0	33.3	66.7	100.0		
	Col %	0.0	2.9	5.7	2.9		
	TOTAL	35	35	35	105		
	Row %	33.3	33.3	33.3	100.0		
	Col %	100.0	100.0	100.0	100.0		

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