

How to Harvest Long Saphenous Vein in Affordable and Cosmetic Technique?

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Abstract

Still most of cardiac surgeons worldwide are searching for best cosmetic technique for saphenous vein harvesting in CABG patients without costing the patients extra financial overload so during this study we used combined preoperative duplex mapping with lens guidance to optimize vein harvested quality through skin tunnels.





Keyword: Saphenous vein; CABG; Lens assisted bridging vein harvest

1. Surgical Background

The TABLE 1 below show the historic transition of idea of minimal invasive vein harvesting.

TABLE 1. Demonstrating differences between different historical trials for minimal invasive saphenous vein harvesting.

	Laryngoscope and Cusco-speculum.	Mayo vein stripper.	Vega system (B/Braun-Aesculap, Tuttlingen, Germany)	SaphLITE system
Advantages	Low costs.	1- Low costs. 2- skin bridges up to 7 cm.	1- Gives roomy tunnels for vein harvesting. 2- Reusable.	1- Lighted tunnel for vein harvesting. 2- Reusable.
Disadvantages	1- Very bad vein quality. 2- Skin bridge no more	1- Moderate vein quality with	1- More costs. 2- No available light	1- More costs. 2- Distant vision of target

	than 5 cm.	complications of vein traction.	source for good vision.	branches. 3- Chance of bifurcated vein or false track.
Image demonstration	[1]  [2]	[3]  4.8mm	[4] 	[5] 

2. Material and Methods

2.1 Operative procedure

Every patient should have ultrasound duplex mapping by using US (**Philips HD11 XE US machine, Netherlands**) with high resolution multi-frequency 7.5 MHz linear transducer. Next a skin incision done 2-3 cm with introduction of **90 degree KARL-STORZ HOPKINS** diameter 5.5 mm, length 50 cm, autoclavable lens (10320D coded) into the wound after that its tributaries clipped on the patient side and cut then repeat process till desired length harvested. This 90 degree lens allows vertical view of saphenous vein and its branches, allowing dissection and clipping of branches, shown in FIG. 1 below.



FIG. 1. Shows 90 degree KARL-STORZ lens used in saphenous vein harvesting.

2.2 Intra-operative criteria assessed

Saphenous vein grafts harvested by this technique assessed. See FIG. 2-6 below.



FIG. 2. Showing lens assisted saphenous vein harvesting technique with small skin bridges with a good vein quality.



FIG. 3. Showing a long saphenous vein harvested by lens assisted bridging technique with good cosmetic results.



FIG 4. Show lens assisted bridging technique with postoperative 6 weeks results.



FIG 5. Show lens assisted bridging technique intraoperative results.



FIG 6. Show postoperative 2 month follow up of lens assisted bridging technique.

2.3 Post-operative criteria assessed

We will be assessed the following criteria during postoperative 6 weeks:

1. Pain sensation.
2. Cosmetic results.
3. Patient satisfaction.
4. Lower limb oedema.
5. Duration of Post-operative hospital stay.
6. Wound complications assessment.

3. Results

TABLE 2. Show comparison between traditional and LDB technique regarding vein quality, vein length, skin flap formation and bad quality vein detection.

	Conventional	Bridging	P value	significance
Length of incision	Mean : 31.7 cm	Mean : 12 cm	0.00	Significant
Vein harvesting	Mean : 37.6 min	Mean : 38 min	0.865	Not significant

time				
Vein integrity (No. of repairs for tears sand side holes)	No repairs: 18 1 repair: 6 2 repairs: 4 >2 repairs: 2	No repairs: 16 1 repair: 8 2 repairs: 2 >2 repairs: 4	0.723	Not significant
Vein quality	Good: 20 Fair: 8 Bad: 2	Good: 16 Fair: 12 Bad: 2	0.533	Not significant
Skin Flap formation	50% of patients	0% of patients	0.003	Significant
Skin incision over bifurcated useless vein graft	40% of patients	0% of patients	0.004	Significant

3.1 Post-operative hospital stay

During post-operative period hospital stay has been calculated which showed that mean stay in conventional technique was 26 days while in bridging technique was 11 days with p value 0.000.

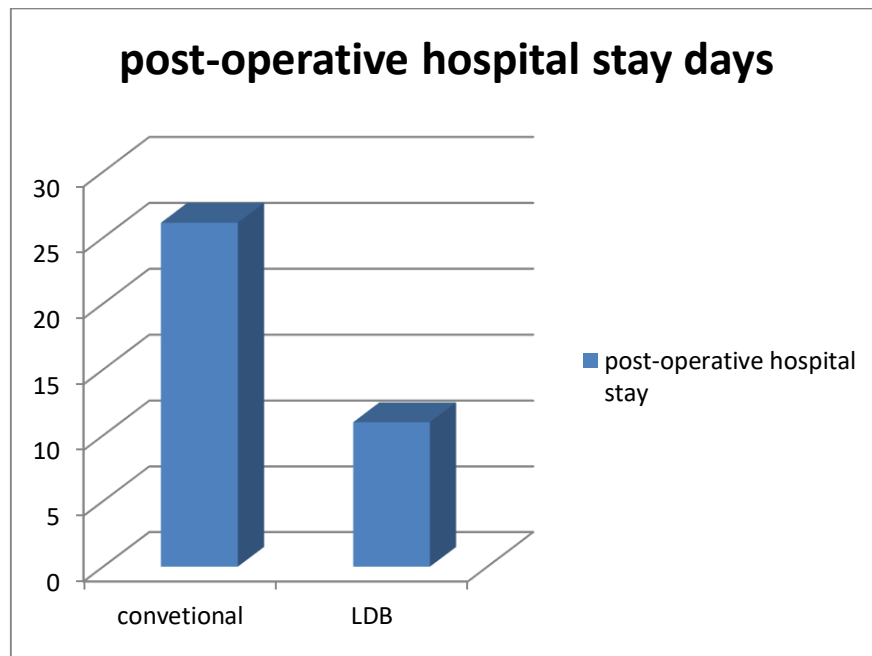


CHART 1. Relation between technique of harvesting and post-operative hospital stay.

3.2 Costs

Lens assisted bridging technique after duplex mapping didn't cost the patients anymore costs as the used lens was already present as rigid bronchoscope lens which is autoclavable and reusable. Also right angled retractor was reusable and autoclavable so didn't cost the patient anything.

4. Discussion

4.1 Intraoperative findings

During the harvesting operation we have examined all veins for type vein wall and its integrity, also we assessed number of injuries per vein segment, and we also studied the mechanical effects of traction on vein wall. Noticed that wrong skin incision and vein wall integrity were improved by duplex mapping which was described by Alan Soo, et al. in previous study which inspired me to use duplex in bridging technique [6].

4.2 Postoperative findings

During this we noticed that the larger the skin tunnel, the lower skin harvesting side effects will occur [7]. Also it was found lower skin traction and sepsis complications [8]. Moreover this method saved money and most of patients were happy with it [9]. Finally, it's important to mention that this technique had the same harvesting time as traditional technique [10].

Regarding cost effectiveness, showed that lens assisted bridging technique needs only few extra costs with a reusable tool or even can be done with no extra tool more than ordinary surgical tools. So this method is cost effective and doesn't load patients more debates.

A study by Ursalan A. Khan in 2009 showed that further advantages for SBT include a reduction in cost and side effects associated with postoperative pain medications [9].

A study by Omer Aziz in 2006 showed in comparing minimally invasive and conventional techniques, that the cost of re-admission for wound complications (mainly leg wound infection) has also been estimated and overloaded conventional technique patients [11].

All previous studies showed same results as ours that interrupted vein harvesting is a cost effective technique even more than endoscopic vein harvesting. Regarding Length of post-operative hospital stay: Showed that (LDB) vein harvesting patients had less post-operative hospital stay days in relation to conventional technique this due to shorter wound length and lower incidence of skin flap formation, so less pain and wound complications besides that lower rate of infection cause less post-operative need for hospital admission and antibiotic given. Period of postoperative hospital stay appears to be relatively long, but it is our center preference due to relatively higher rate of graft occlusion and death during early post-operative period and poor postoperative rehabilitation program.

A study by Sheraz R. Markar in 2010 showed that there was no significant difference in total length of hospital stay between the two groups. The average hospital stay in the open group was 7.95 days. The average hospital stay in the minimally invasive group was 7.69 days [12].

A study by Muhamed Musharaf in 2013 also showed that mean hospital stay was prolonged in OVH group (13 ± 12.5 days) as compare to IVH group (10.5 ± 9.0 days) [10]. So above studies showed same outcome as our study.

5. Conclusion

To summarize, usage of combined ultrasound and skin retractor with lens to explore vein during harvesting can save money and time with reduction of wound morbidity.

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