

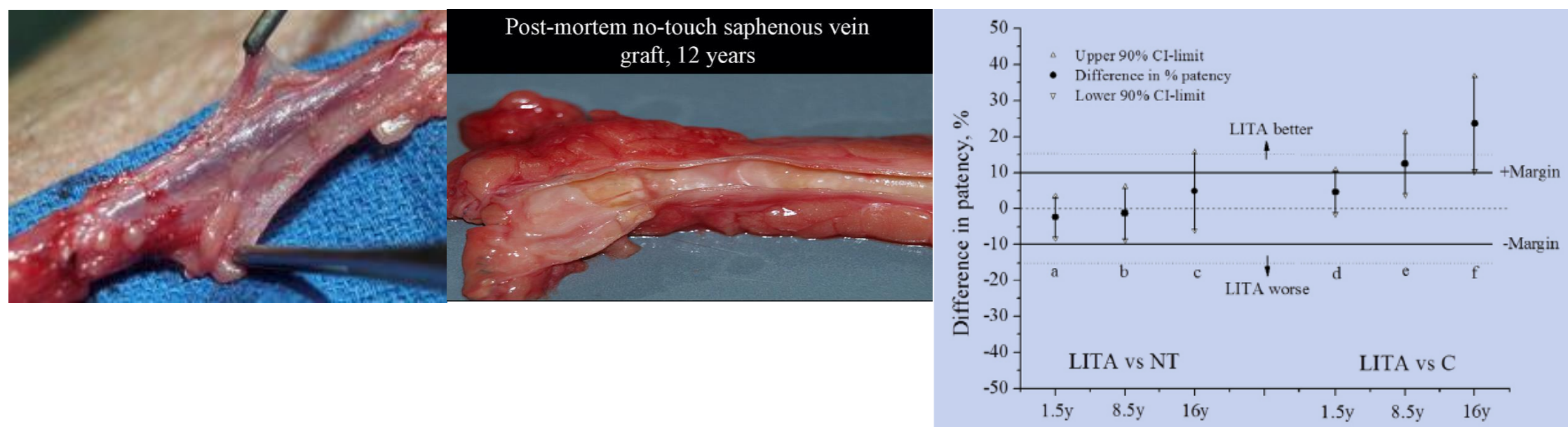
Kunihiko Yoshino¹, Keita Kikuchi¹, Rihito Tamaki², Hiroki Sakai¹, Yoshun Sai¹, Kaito Masuda¹, Joji Ito¹, Kohei Abe²

1. Tokyo Bay Urayasu Ichikawa Medical Center Cardiovascular Surgery
2. St. Luke's International Hospital Cardiovascular Surgery

Back ground

The Saphenous Vein Graft (SVG) remains a vital component in coronary artery bypass grafting. Its advantages include availability, length, ease of harvesting, and handling. However, it's crucial to address the significant drawbacks such as **reduced long-term patency and potential leg wound complications** associated with traditional harvesting methods.

In the ESC guidelines, Endoscopic Vein Harvesting (EVH) is recommended to reduce wound complications, while the No-touch harvesting technique is advocated for enhancing long-term patency.



No-touch SVG have a higher graft patency than conventional SVG.

NT-SVG may have a long-term patency rate comparable to LITA.

Content and image: Samano, Ninos, et al. "The no-touch saphenous vein for coronary artery bypass grafting maintains a patency, after 16 years, comparable to the left internal thoracic artery: A randomized trial." *The Journal of Thoracic and Cardiovascular Surgery*, vol. 150, no. 4, Oct. 2015, pp. 880–888, <https://doi.org/10.1016/j.jtcvs.2015.07.027>.

Advantages of SVG

1. Availability
2. Length
3. Ease of Harvesting
4. Ease of Handling

Disadvantages of SVG

1. Long-term patency
2. Leg wound complication

Endoscopic vein harvesting, if performed by experienced surgeons, should be considered to reduce the incidence of wound complications. 490,493,494,500,554	Ila	A
No-touch vein harvesting should be considered when an open technique is used. 504,507,555,556	Ila	B

Both graft quality and fewer wound complications should be achieved!

Ann Thorac Cardiovasc Surg 2023; 29: 163–167

European Heart Journal, Volume 40, Issue 2, 07 January 2019, Pages 87–165

Table 3 Leg Infection

	NT	CON
Incidence of Infection, n (%)		
30-days: N = 232	27 (23.3)	11 (9.5)



The SUPERIOR SVG trial reported that **leg infections occurred in 23%** of patients in the NT SVG group.

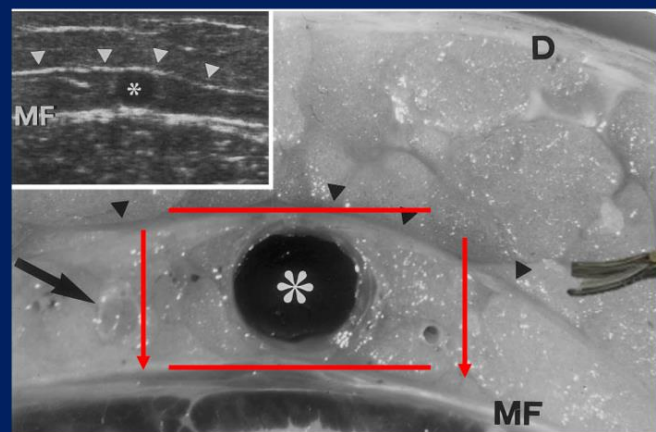
Siddiqi, M. S. Chronic Wound Care Management and Research, (2016). 147-156.
Deb et al. *Journal of Cardiothoracic Surgery* (2019) 14:85

Our technique

Our NT-EVH technique is meticulously designed to **preserve the histological features of the saphenous vein**, ensuring the integrity of the intimal layer and maintaining the vasa vasorum. By avoiding direct contact and minimizing trauma during extraction, we uphold the structural and functional viability of the vein. We have demonstrated that no-touch EVH effectively preserves these critical histological features, including **intimal folding and patent vasa vasorum**.

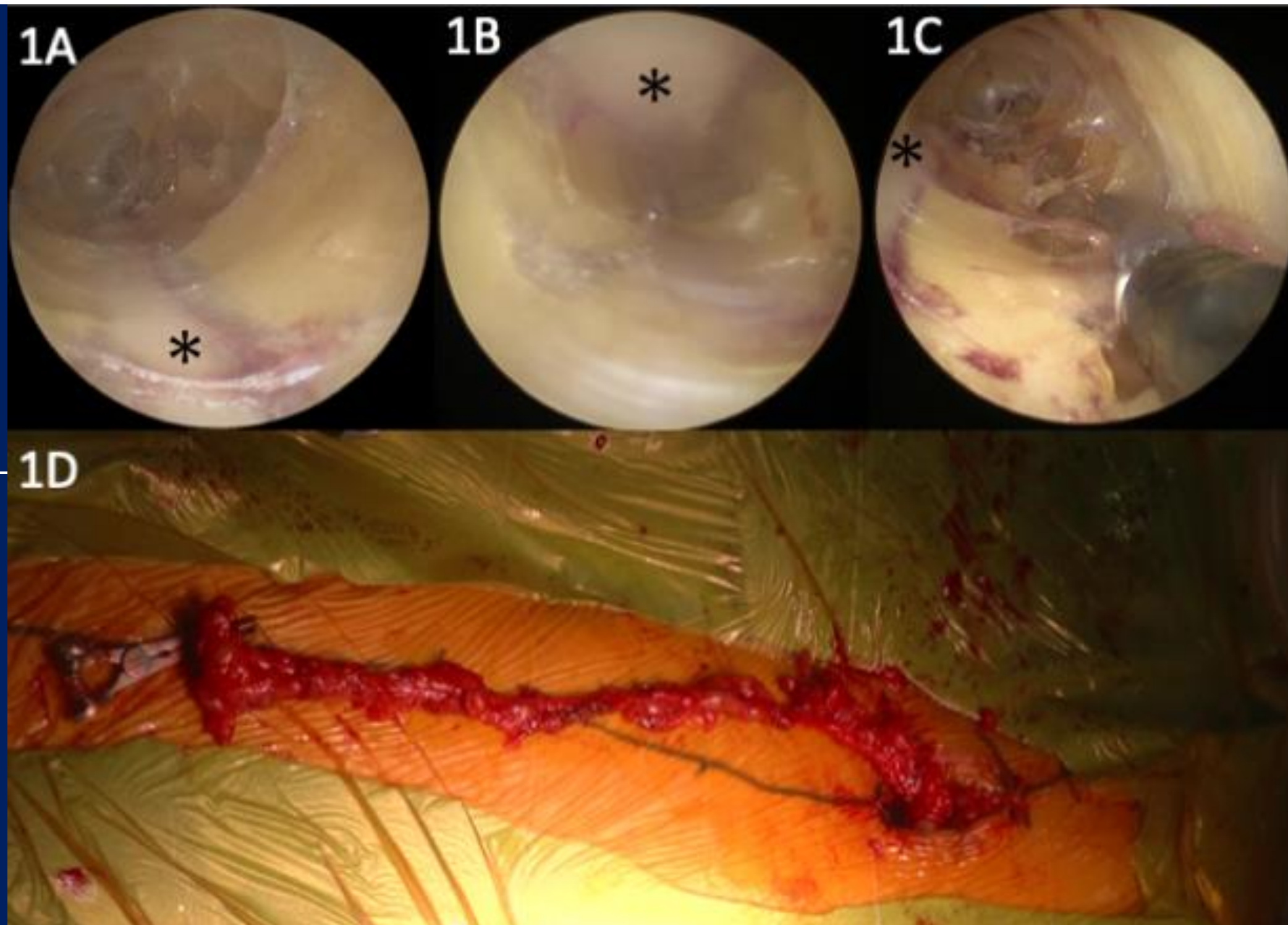
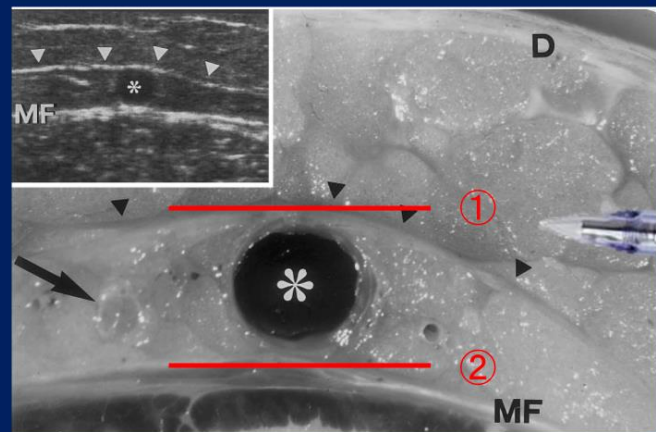
How to perform NT-EVH

- NT-EVH is performed using Vasoview Hempro 2.
- Visualize the location of SVG under connective tissue.



How to perform NT-EVH

- NT-EVH is performed using Vasoview Hempro 2.
- Visualize the location of SVG under connective tissue.



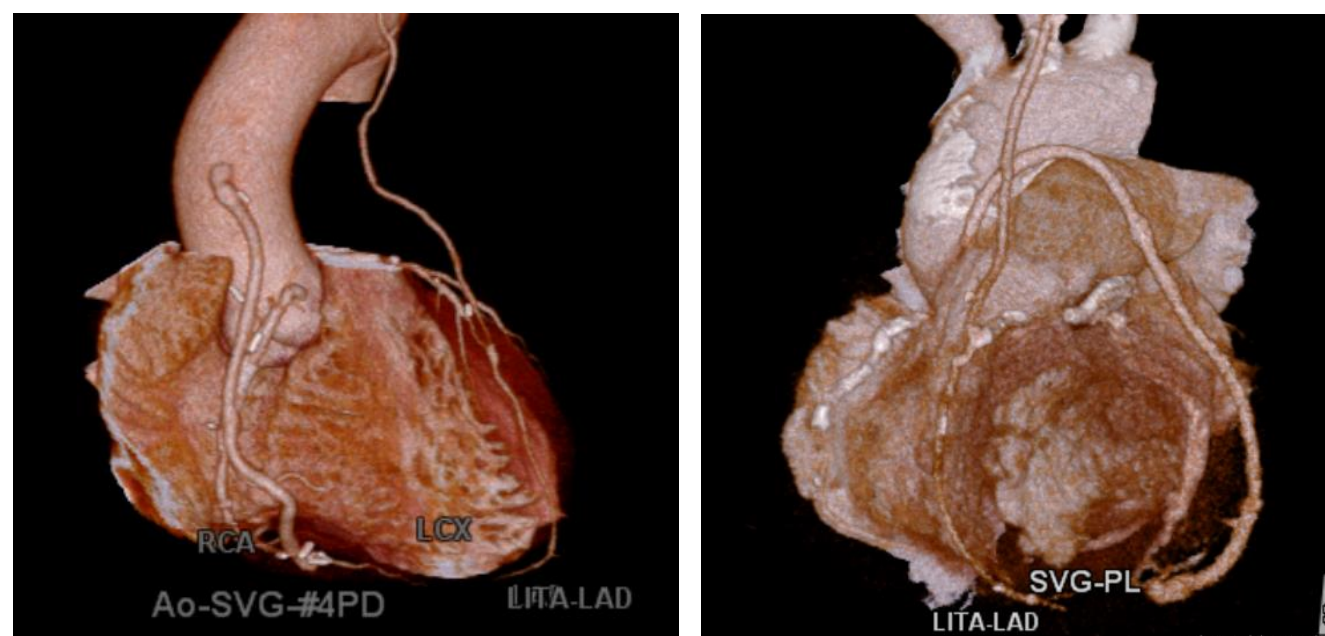
A **131 anastomosis** of 77 cases was performed using the NT-EVH technique. The average patient age was 68 years, and 68% had diabetes. We included 11 emergency cases. In our procedures, 14 were concomitant surgeries, 75% were off-pump, and 36% used minimally invasive techniques. The average operation time was 322 minutes, and harvesting took about 61 minutes. There was only one incident of graft injury, which required converting to open harvesting.

Early Patency / Wound Complication

The **early patency rate was 98%**, and the CT images showed good, smooth saphenous vein grafts. We encountered just **one wound complication**, which we will discuss further.

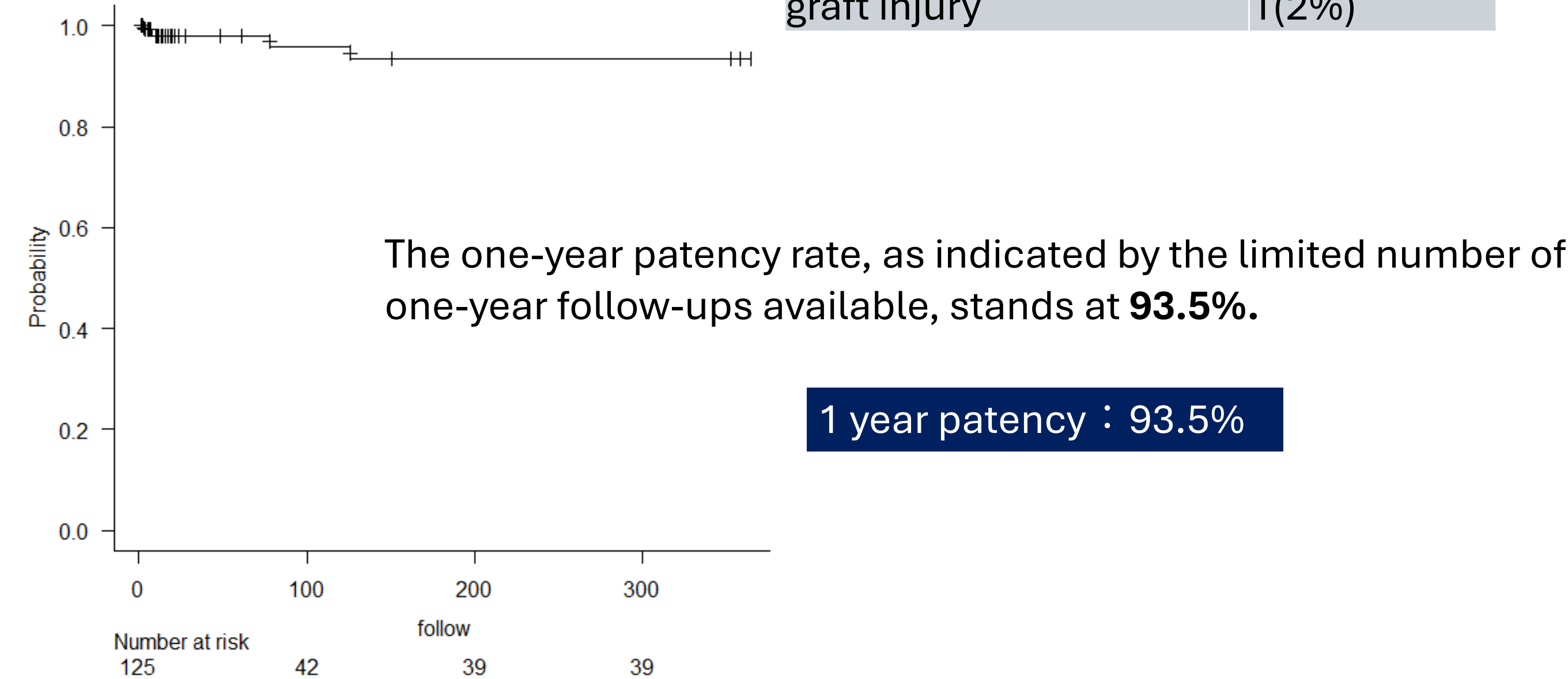
Early patency : 115/118 (98%)

Wound complication 1/77(1%)



Results

Background	(n=77)	Operative demographics	(n=77)
Age	68 ± 12	Concomitant	14(18%)
Male(%)	65(84%)	off pump	58(75%)
BMI	26 ± 5	MICS-CABG	28(36%)
Hypertension	60(78%)	total target	3.6 ± 1
Dislipidemia	46(60%)	SVG target	131
Diabetes	52(68%)	RCA	77
HbA1c	7 ± 1	LCX	37
Hemodialysis	18(23%)	Dx	16
Preop EF	47 ± 14%	Op time	322 ± 84分
Emergency	11(14%)	SVG Harvesting Time	61 ± 21分
		graft injury	1(2%)



1 year patency : 93.5%

Discussion

① What should be accomplished with NT-SVG?

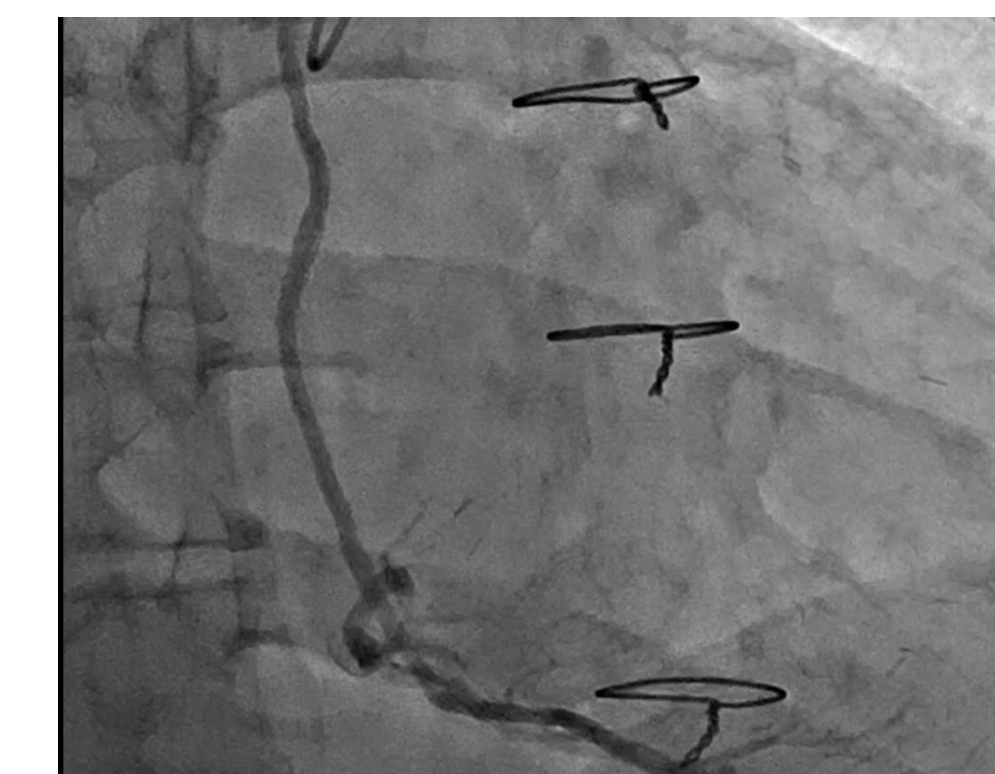
We occasionally encounter SVGs that remain well open for long periods of time. Even if the SVG was taken by conventional methods.

The CAG shows good patency of SVG(conventional) ~4PD 14 years after CABG.

These SVGs are considered "living grafts".

Here are some elements that improve the "survivability" of SVG.

These **are not "all or none,"** but are thought to influence each other little by little. We believe that achieving as many of these factors as possible in EVH is important to improve the long-term viability.

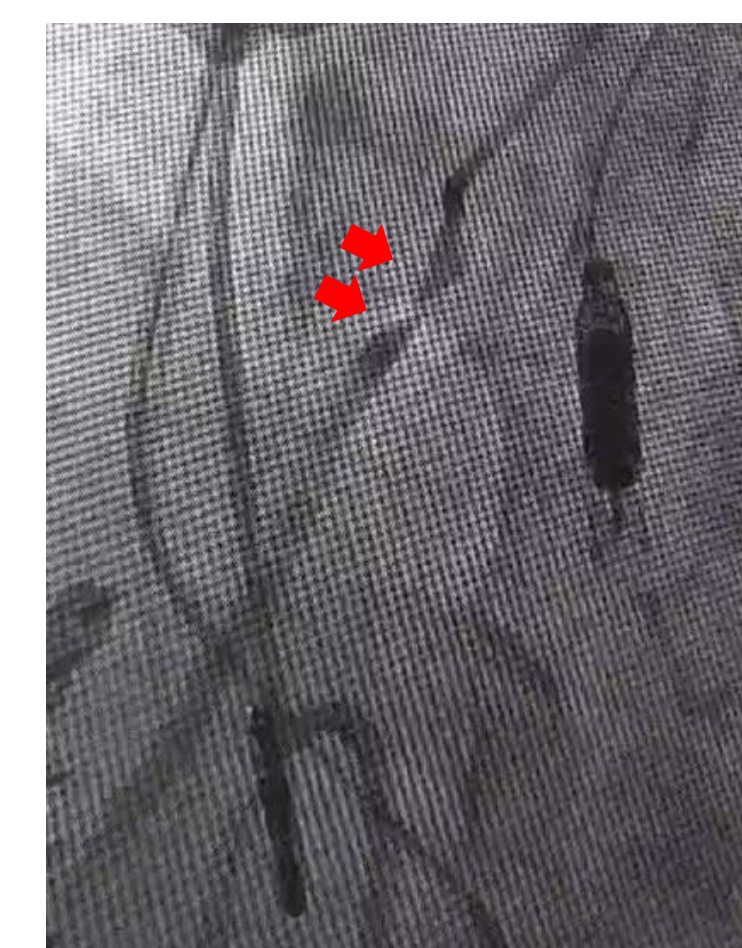


- Preserved intimal folding
- Patent vasa vasorum
- Preserved PVAT

② What to watch out for in NT-EVH

• Prevention of graft torsion
It is difficult to recognize the **SVG torsion hidden in the adipose tissue**. We use arterial pressure to sufficiently extend and **mark the SVG**.

• No injury to deep fascia.
The **deep fascia should be preserved** to avoid bleeding and infection. Our only case of infection involved an SVG traveling under the deep fascia.



Conclusion

The No-touch Endoscopic Vein Harvesting (NT-EVH) technique shows improving graft patency and reducing wound complications. Our data demonstrate a high early patency rate of 98% and a one-year patency rate of 93.5%, with minimal wound complications (1%). This technique, therefore, represents a significant advancement in coronary artery bypass grafting, potentially enhancing long-term patient outcomes.

Disclosure

The authors declare no conflicts of interest (COI) in relation to this study.