

High Patency Rates And Low Wound Complication Rates Can Be Achieved With No Touch Endoscopic Vein Harvesting

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COI disclosure
The author have no financial conflicts of interest to disclose concerning the presentation.

①Background

The saphenous vein graft (SVG) remains an essential conduit in coronary artery bypass grafting (CABG), offering advantages such as wide availability, sufficient length, and ease of handling. However, traditional harvesting methods are associated with notable disadvantages, including reduced long-term patency and a high incidence of leg wound complications. According to the ESC guidelines, Endoscopic Vein Harvesting (EVH) is recommended to reduce wound complications, while the No-touch technique is advocated to improve long-term graft patency[1-2]. To integrate the benefits of both approaches, we developed a new technique: **No-touch Endoscopic Vein Harvesting (NT-EVH)**, aiming to achieve both high graft patency and reduced wound complication rates[3]. This study was conducted to evaluate the early outcomes of NT-EVH, focusing on **one-year graft patency and wound complication rates**.

1)Samano, Ninos, et al. *The Journal of Thoracic and Cardiovascular Surgery*, vol. 150, no. 4, Oct. 2015, pp. 880–888
2) Neumann, Franz-Josef, et al. *European Heart Journal*, Volume 40, Issue 2, 07 January 2019, Pages 87–165
3) Yoshino, Kunihiko, et al. *Innovations (Phila)*. 2020 Sep/Oct;15(5):475-477

②Methods

- No-Touch Endoscopic Vein Harvesting (NT-EVH)** was performed using our previously published technique (*details are described in "How to Perform NT-EVH"*).
- Patient data were collected retrospectively.

Primary Outcomes

- 1.**1-year graft patency**
- 2.**Wound infection**, defined as any complication requiring surgical intervention or antibiotic therapy

Statistical Analysis

- Categorical variables are presented as counts (percentage), and continuous variables are shown as mean $\pm$ standard deviation or median (interquartile range), as appropriate.
- Comparisons between groups were performed using **Fisher's exact test** for categorical variables and **Student's t-test** or **Wilcoxon rank-sum test** for continuous variables.
- Kaplan-Meier analysis** was used to assess graft patency over time.
- A **p-value < 0.05** was considered statistically significant.
- All analyses were conducted using **EZR**, a graphical interface for R.

③Results

A total of **116 grafts** were harvested from **108 patients** using NT-EVH between August 2018 and November 2024.

Table 1 Patient Characteristics

Variable	Value (n=108)
Age(mean $\pm$ SD)	67 $\pm$ 11
Male(%)	92(85%)
Hypertension(%)	83(77%)
Diabetes Mellitus(%)	71(66%)
HbA1c(mean $\pm$ SD)	6.9 $\pm$ 1
Hemodialysis(%)	24(22%)
LVEF(mean $\pm$ SD%)	48 $\pm$ 6%
Euro score II	2.0 (IQR: 1.1-3.7)
Emergent	16(15%)

Table 2 Operative Demographics

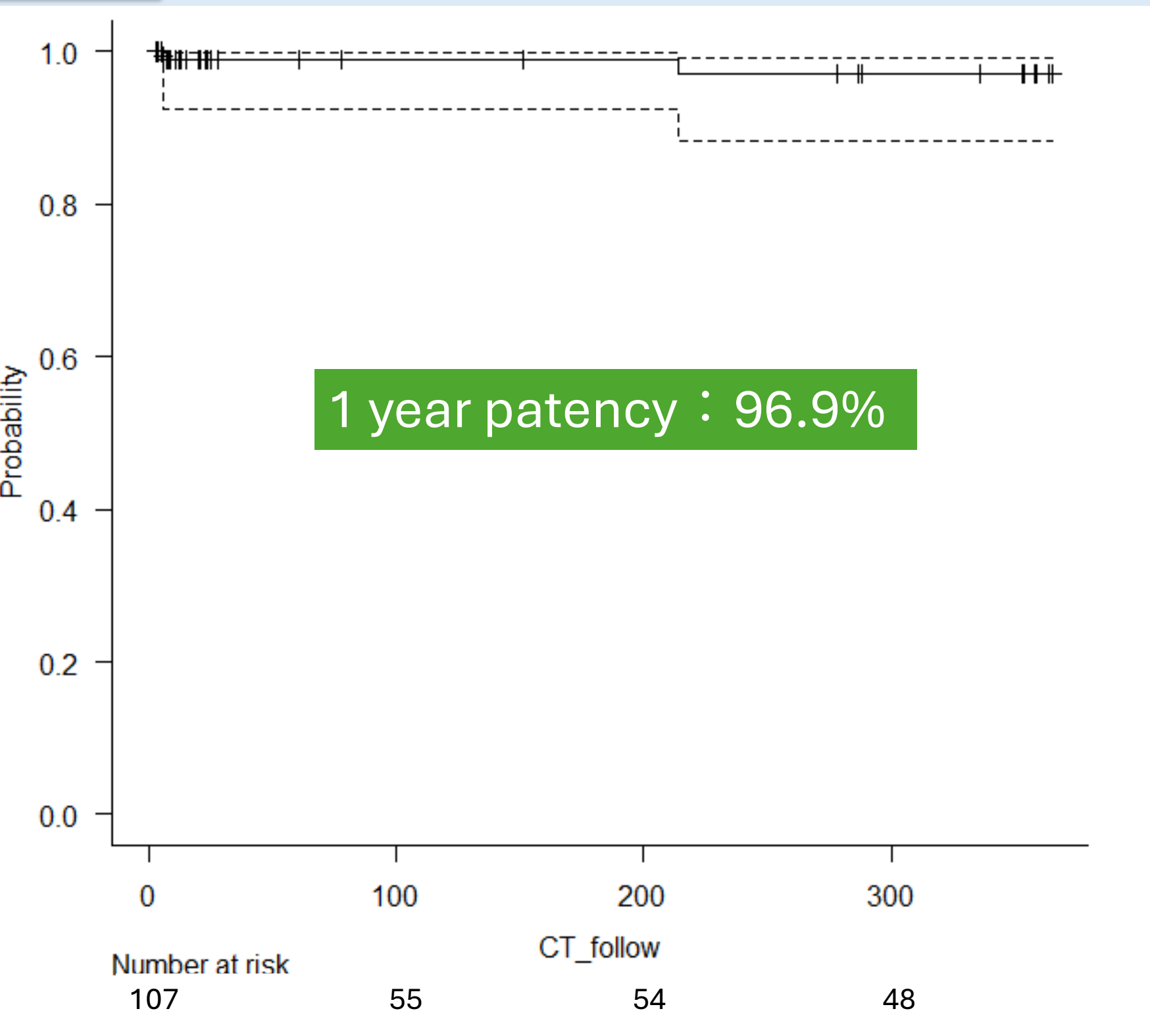
Variable	Value (n=108)
Isolated CABG(%)	97(90%)
Off pump(%)	83(77%)
MICS-CABG(%)	47(44%)
Total anastomoses	3.5 $\pm$ 1.1
BIMA use	78 (72%)
NT-SVG anastomoses	183
RCA	109 (60%)
Diagonal	20 (11%)
LCX	53(29%)

Table 3 Early Outcomes

Variable	
Leg wound infection	3 (2.7%)
Early patency	105/107 (98%)

Postoperative CT angiography was conducted in 99 patients (92%), assessing 107 grafts. The early patency rate of NT-SVGs was 98% (105/107)[Table 3].

Fig. 2



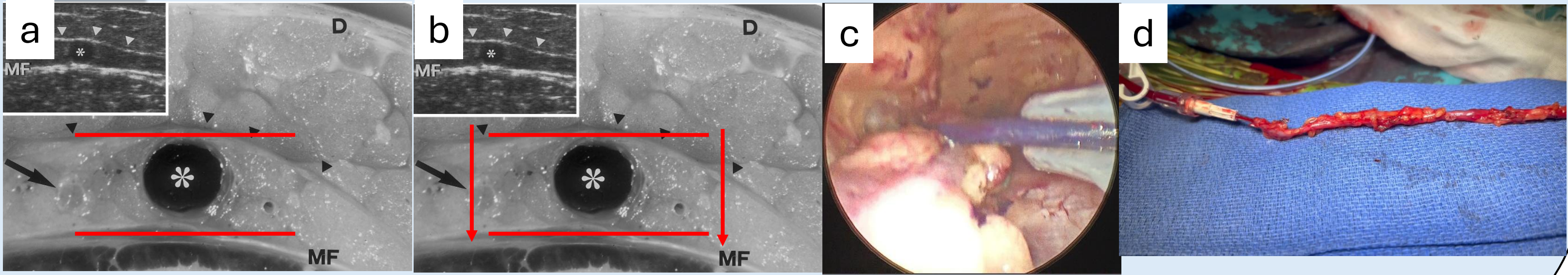
The reasons for not undergoing CT angiography : CKD (6 cases), death (4 cases), allergy (1 case), refusal (1 case), and follow-up at other hospitals (7 cases).

How to perform NT-EVH

Vasoview Hemopro 2® is used for NT-EVH

1. Anterior and posterior surface of SVG are harvested preserving perivascular connective tissue using Vasoview dissector [Fig.1a].
2. Lateral surface are dissected with Vasoview harvester with preserving perivascular adipose tissue [Fig. 1b].
3. Marking on anterior surface of SVGs are performed for the prevention of twisting of SVGs [Fig. 1c].
4. SVGs are expanded with arterial pressure for the preparation before anastomosis [Fig.1d].

Fig. 1



④Discussion

In the current study, NT-EVH demonstrated excellent one-year graft patency. Our previous research showed that saphenous veins harvested via NT-EVH preserved key histological features—such as intact perivascular adipose tissue, intimal folding, and patent vasa vasorum—similar to those of open NT-SVG [3, Fig. 3]. To maintain these characteristics, it is essential to harvest the vein as a **"living graft."** Additionally, preventing twisting and thrombus formation is critical for avoiding early graft failure. To address this, we routinely mark the vein endoscopically and delay transection until after full heparinization.

We did observe three cases of leg wound complications. In each of these, the **deep fascia was injured** during harvesting. This highlights the importance of **preserving the deep fascia** to minimize the risk of bleeding and infection

Fig. 3

