



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

**KSN** SEOUL, KOREA  
**2026**

The 46th Annual Meeting of the Korean Society of Nephrology



Jun 11 (Thu) – 14 (Sun), 2026

COEX, Seoul, Korea

**Abstract Type : Oral presentation**

**Abstract Submission No.: A-0638**

**Abstract Topic : Interventional Nephrology**

**Title : Patency Outcomes of Bare-Metal Stents and Stent Grafts for Lesions Requiring Stent Placement in Hemodialysis Vascular Access**

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**Objectives :** Hemodialysis vascular access dysfunction caused by stenosis and thrombosis remains a major clinical challenge. Stent placement is often required when angioplasty alone is insufficient. However, clinical outcomes following stent or stent graft placement in real-world patients with advanced dysfunctional hemodialysis vascular access remain incompletely defined.

**Methods :** We conducted a retrospective single-center study of patients who underwent endovascular stent or stent graft placement for dysfunctional hemodialysis vascular access between August 2014 and September 2024. After predefined exclusions, 187 patients were included. The primary outcomes were intervention-free and thrombosis-free survival. Primary lesion patency and secondary patency were also evaluated. Kaplan–Meier analysis with the log-rank test was used, and patency rates at 3, 6, and 12 months were evaluated.

**Results :** A total of 187 patients were included, with 148 receiving bare-metal stents and 39 receiving stent grafts. The 3-, 6-, and 12-month intervention-free survival rates were 35.8%, 18.2%, and 12.2% in the stent group and 48.9%, 27.5%, and 24.4% in the stent graft group (log-rank  $p = 0.11$ ). The 3-, 6-, and 12-month thrombosis-free survival rates were 73.8%, 66.7%, and 55.4% in the stent group and 86.0%, 79.6%, and 69.4% in the stent graft group (log-rank  $p = 0.08$ ). Primary lesion patency was significantly higher in the stent graft group (log-rank  $p = 0.025$ ), with 6- and 12-month rates of 23.9% and 15.5% for bare-metal stents and 33.2% and 30.2% for stent grafts. Secondary patency was also better in the stent graft group (log-rank  $p = 0.023$ ), with 6- and 12-month rates of 74.7% and 67.8%.

**Conclusions :** Even in advanced lesions requiring stent placement after unsuccessful angioplasty, acceptable patency can be achieved. Although intervention-free and thrombosis-free survival showed only a trend favoring stent grafts, primary lesion patency and secondary patency were significantly improved with stent grafts, suggesting potential advantages in maintaining dialysis access function.

Table 1.jpg



Table 1 Baseline Clinical, Access and Lesion characteristics according to stent type

|                                        |                                | Stent      | Stent graft | p Value |
|----------------------------------------|--------------------------------|------------|-------------|---------|
| Age, years                             |                                | 66.8±13.4  | 68.7±12.3   | 0.41    |
| Sex, no. (%)                           | Male                           | 80 (54.1)  | 13 (33.3)   | 0.02    |
|                                        | Female                         | 68 (45.9)  | 26 (66.7)   |         |
| DM, no. (%)                            |                                | 85 (59.9)  | 21 (56.8)   | 0.732   |
| Vascular access no. (%)                | AVF                            | 70 (47.3)  | 19 (48.7)   | 0.87    |
|                                        | AVG                            | 78 (52.7)  | 20 (51.3)   |         |
| Hemodialysis vintage, months           |                                | 65.8±67.6  | 49.3±47.5   | 0.16    |
| Vascular access vintage, months        |                                | 47.6±50.5  | 33.7±31.9   | 0.11    |
| Thrombosis at presentation no. (%)     |                                | 80 (54.1)  | 14 (35.9)   | 0.04    |
| Location of lesion, no. (%)            | Central                        | 60 (40.5)  | 8 (20.5)    | 0.24    |
|                                        | Peripheral                     | 88 (59.5)  | 31 (79.5)   |         |
| Stent/SG diameter, mm                  |                                | 9.3±3.1    | 7.7±1.5     | <0.001  |
| Reason for stent /SG insertion no. (%) | Recurrent lesion               | 21 (14.2)  | 2 (5.1)     | 0.118   |
|                                        | Elastic recoil/ Remnant lesion | 100 (67.6) | 25 (64.1)   |         |
|                                        | Rupture/pseudoaneurysm         | 27 (18.2)  | 12 (30.8)   |         |

Baseline demographic, vascular access, and lesion characteristics of patients who underwent endovascular stent or stent graft placement for dysfunctional hemodialysis vascular access. Continuous variables are presented as mean ± standard deviation and categorical variables as number (%).

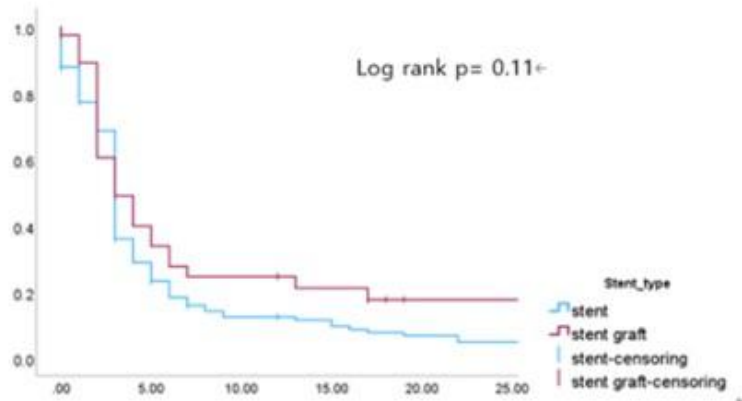
Abbreviations: AVF = arteriovenous fistula; AVG = arteriovenous graft; DM = diabetes mellitus; SG = stent graft.

Table 1.jpg



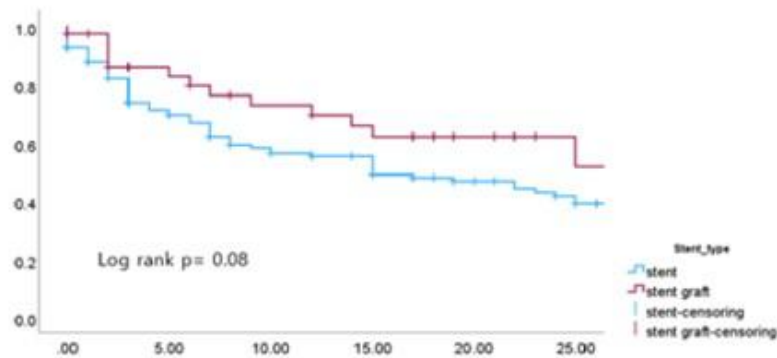
Figure 1. Kaplan–Meier curves for intervention-free and thrombosis-free survival after stent placement in hemodialysis vascular access.

Kaplan–Meier curves for intervention-free survival after stent placement in hemodialysis vascular access.



| Patency <sup>a,1</sup> | Stent(BMS) <sup>a,2</sup> | Stent graft <sup>a,3</sup> |
|------------------------|---------------------------|----------------------------|
| 3mo <sup>a,1</sup>     | 35.8% <sup>a,2</sup>      | 48.9% <sup>a,3</sup>       |
| 6mo <sup>a,1</sup>     | 18.2% <sup>a,2</sup>      | 27.5% <sup>a,3</sup>       |
| 12mo <sup>a,1</sup>    | 12.2% <sup>a,2</sup>      | 24.4% <sup>a,3</sup>       |

Kaplan–Meier curves for thrombosis-free survival after stent placement in hemodialysis vascular access.<sup>a,4</sup>



| Patency <sup>a,1</sup> | Stent(BMS) <sup>a,2</sup> | Stent graft <sup>a,3</sup> |
|------------------------|---------------------------|----------------------------|
| 3mo <sup>a,1</sup>     | 73.8% <sup>a,2</sup>      | 86.0% <sup>a,3</sup>       |
| 6mo <sup>a,1</sup>     | 66.7% <sup>a,2</sup>      | 79.6% <sup>a,3</sup>       |
| 12mo <sup>a,1</sup>    | 55.4% <sup>a,2</sup>      | 69.4% <sup>a,3</sup>       |