

Editorial

# Establishment and maintenance of autogenous arteriovenous fistula in hemodialysis patients: A new beacon

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Autogenous arteriovenous fistula (AVF) is a lifeline for maintenance hemodialysis patients. In 2006, the vascular access guidelines issued by the Kidney Disease Outcomes Quality Initiative (KDOQI) introduced the concept of “Fistula first”.<sup>1</sup> In 2019, the same organization updated these vascular access guidelines and proposed the concept of “Patient first”,<sup>2</sup> sparking a wide range of controversy and discussion on whether to abandon the “Fistula first” principle. Given this context, experts from across China mainland conducted a comprehensive and systematic evaluation of the relevant literature, evidence-based medical guidelines, and international guidelines. Given the regional and racial differences with regard to vascular access,<sup>3,4</sup> over 3000 articles were reviewed with an emphasis on studies related to the Asian population. After much deliberation, 132 references were finally included, and an “Expert Consensus on the Establishment and Maintenance of

Autologous Arteriovenous Fistula” (hereinafter referred to as the Consensus) was completed. Recommendations were made based on AVF preoperative assessment and planning, surgical implementation, postoperative intervention, and nursing. A total of 16 guidelines were issued with corresponding evidence statements and a number of research directions were proposed.

Hemodialysis patients with AVF as vascular access have significant advantages with respect to quality of life, complications, and primary and secondary patency rates.<sup>5,6</sup> According to the current characteristics of uremia patients in China, the majority of patients are young and middle-aged. Chronic glomerulonephritis still ranks first among its causes, and the proportion of the population diagnosed with diabetes is lower than in developed countries and regions.<sup>7</sup> A consideration of all the survey results from China, the 2015 vascular access guidelines issued by the Japanese Society for Dialysis Therapy (JSDT),<sup>8</sup> the 2018 vascular access guidelines issued by the European Society for Vascular Surgery (ESVS),<sup>9</sup> and the 2019 KDOQI guidelines resulted in the Consensus that AVF should still be prioritized in hemodialysis patients after appropriate evaluation and planning.

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The inner diameter of the vessel is essential for AVF maturation. However, no uniform opinion exists on the minimum inner diameter of the vessel permissible for the operation. Both the European vascular access guidelines and the KDOQI guidelines indicate that the surgical site should be carefully evaluated or reselected in ESKD patients with a radial artery or cephalic vein inner diameter of less than 2.0 mm. The Japanese vascular access guidelines indicate that the minimum inner diameter of the radial artery should be between 1.5 mm and 2.0 mm, and the minimum inner diameter of the vein (after tourniquet application) should be between 1.6 mm and 2.5 mm; diameters below this range result in lower success rates. Based on the characteristics of the Chinese population and the actual condition of patients, the Consensus recommends that the preoperative inner diameter of the radial artery and cephalic vein (after tourniquet application)  $\geq 2.0$  mm may be considered an indication for surgery; if the preoperative inner diameter of the radial artery and cephalic vein (after tourniquet application) is  $< 2.0$  mm, surgery should be carefully considered; if the preoperative inner diameter of the radial artery and cephalic vein (after tourniquet application) is  $< 1.5$  mm, surgery should be avoided as much as possible or an arteriovenous graft (AVG) operation should be selected instead. It should be noted that the decision of performing the AVF surgery or which method is used should be comprehensively determined based on the patient's general condition and the experience of the surgeon.

The use of AVF in elderly ESKD patients requires adequate preoperative evaluation. The advantages of AVF over a central venous catheter (CVC) and AVG are a source of controversy, and the opinions of some Chinese researchers have changed, especially after the KDOQI guidelines were updated in 2019. The Consensus states that the choice of vascular access should be tailored to the individual. Based on current clinical experience and evidence from the literature, adequate preoperative evaluation is required before performing AVF in elderly patients with chronic renal failure, and it is recommended that the vascular diameter be  $\geq 2.5$  mm. For patients with a vessel inner diameter  $< 2.5$  mm, the factors influencing AVF maturity and patency should be evaluated and considered more carefully, or AVG/CVC should be selected.

There is a lack of uniform criteria for AVF maturation. The 2006 KDOQI guidelines indicate that AVF maturation should meet the “rule of 6s” criteria, namely, vessel inner diameter  $> 6$  mm, internal fistula blood flow  $> 600$  mL/min, and internal fistula vessel depth  $< 6$  mm from the skin surface at a site that is cannulated

easily. The 2019 update to the KDOQI guidelines abandons these criteria, instead recommending that AVF maturation is primarily based on clinical judgment. The Chinese Consensus on vascular access based on the characteristics of the Chinese population sets the standard as vascular inner diameter  $> 5$  mm, internal fistula blood flow  $> 500$  mL/min, internal fistula vessel depth  $< 6$  mm from the skin surface, and requirement for three sessions of dialysis per week.<sup>10</sup> The Japanese guidelines do not make specific recommendations for AVF maturation. The Consensus states that successful puncture after AVF surgery and meeting the needs for hemodialysis based on the nurse's experience and evaluation and necessary examinations can be considered as maturity. The plastic fistula cannulas can be routinely used for AVF puncture, especially for early puncture after AVF maturity. Prostaglandins have beneficial effects on AVF maturation.

The Consensus published in this issue provides a new beacon for the establishment and maintenance of autologous AVF in hemodialysis patients, and review, learning, and discussion are recommended.

### Conflict of interest

none.

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