

Microsurgical approach for arteriovenous fistula creation in pediatric patients undergoing hemodialysis

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Introduction:

Arteriovenous fistulas lower costs, infection rates, need for surgical intervention, and lower risk of mortality when compared to catheter or graft access for hemodialysis in patients with end-stage [kidney disease](#). However, the evidence regarding vascular access for hemodialysis in the pediatric population is limited. Diameters of the vessels in children are typically less than 2.5mm; therefore, microsurgical techniques with a microscope and microsurgical instruments are necessary for vascular access in children. Most of the cases documented in the literature are from Europe, none from Latin America. Herein, we present a series of patients with [hemodialysis](#) who underwent arteriovenous fistulas creation using microsurgery.

Materials and methods:

We perform a retrospective analysis of data collected prospectively between September and December 2021. Patients included were children in whom an arteriovenous fistula was created using microsurgical techniques. Data on demographics, preoperative ultrasound, dimensions of the terminolateral [anastomosis](#), type of fistula, and maturation characteristics (assessed by ultrasound at 6 weeks postoperatively) were recorded.

Results:

Five children, aged 13 to 17 years, all of them with stage 5 chronic kidney disease, were included. The patients' weight was <40 kg, the vessels measured between 1.5-2.5 mm. Three radio-cephalic fistulas and 2 braquiocefalics fistulas were performed. One fistula developed stenosis. The other 4 fistulas achieved maturation on the sixth week after surgery showing good flow (mean = 725 ml/min), adequate anastomosis diameters (6.5 mm), and a satisfactory distance between the fistula and the skin (3.5 mm). All measurements were done using Doppler ultrasonography. The mean follow-up was 6 months. There were no infections or hospitalizations as a result of the microsurgical procedure.

Conclusions:

Microsurgery, as a technique, is a resourceful alternative for creating arteriovenous fistulas with good results in both children and adults. The arteriovenous fistulas created with microsurgery met nearly all of the criteria for a good chronic hemodialysis access, including long-term patency, low complication rates, and preservation of the desirable vascular morphologic characteristics.

Alternative dialysis techniques (such as external shunts and vascular grafts) are difficult to implement in young patients and are linked with higher complication rates.

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