

# Percutaneous Arteriovenous Fistula Creation without surgery

Coralie MARIUSSE<sup>1</sup>, Hadia HEBIBI<sup>1</sup>, Alexandre MALLIOS<sup>2</sup>

<sup>1</sup>Fresenius Medical Care – Nephrocare Villejuif Center, <sup>2</sup>Institut Mutualiste Montsouris

## Introduction

The Institut Mutualiste Montsouris (IMM) vascular surgery team has implemented in France and Europe for the first time, an innovative technique developed only two years ago in the United States: the creation of a percutaneous arteriovenous fistula. The patient must have some anatomical criteria to be eligible for the procedure which are evaluated by the vascular surgeon. The fistula is created by ELLYPSIS system without skin incision.

## Objectives

- Anatomy-friendly procedure without incision of the vessels
- Immediate dilatation of the anastomosis: better maturation and faster use
- Simple postoperative follow-up: no scar, no care, and no infection
- Special observation and vigilance by nurses during puncture
- Better appearance (aesthetics): better acceptance of the patient's self-image
- Less complications in the short and medium term: aneurysm, stenosis, black spot, etc.

## Methods

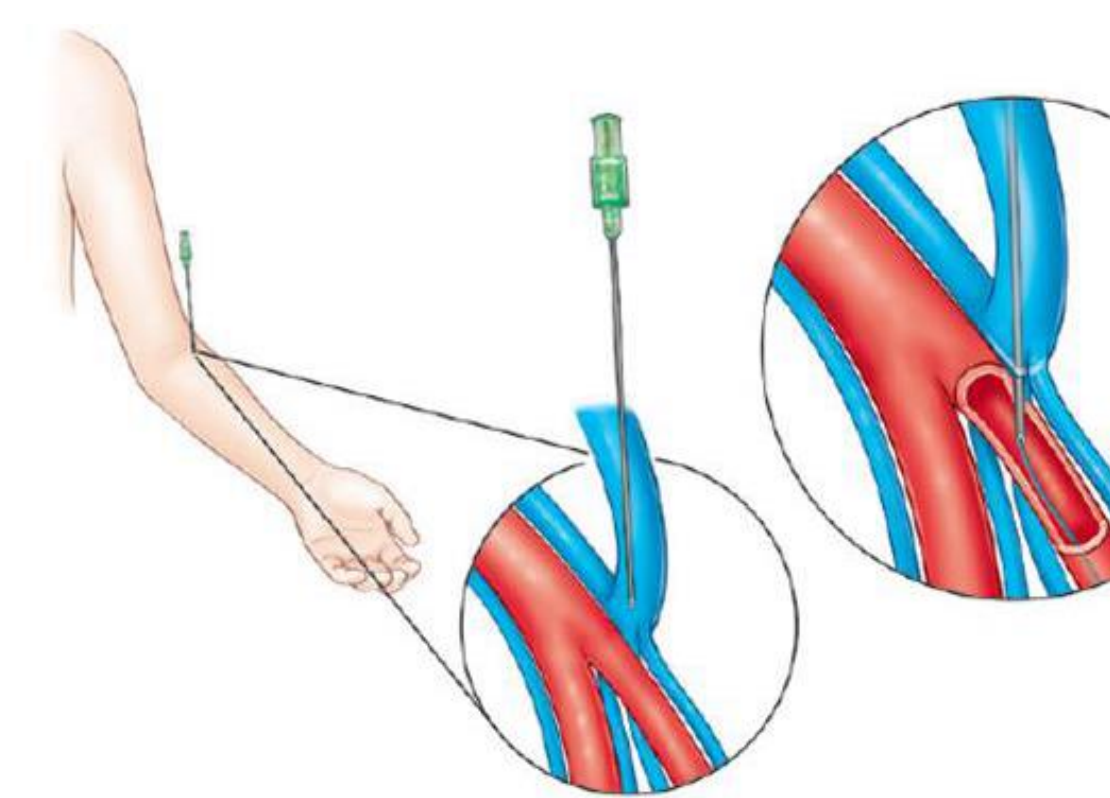
- Percutaneously, guided by ultrasonography, with a device that uses thermofusion (1)
- Better flow with acceleration of ripening and thus early use of the vascular access
- Diagrams and skin markings made by the vascular surgeon to guide the puncture before use
- Closer examination of nurses before puncture

## Results

- 53 percutaneous fistulas created in 9 months in Nephrocare units, including 6 patients requiring dialysis
- Better appearance (esthetics), no scar, no painful procedure after surgery because of complications
- Faster use of fistula to optimise care and avoid the use of a central venous catheter
- The fistula must be cannulated with a tourniquet (garrot) and clampcath and guided by the nephrologist
- No complications like as the high blood flow observed with humeral fistula
- No aneurysms, especially in case of the Button Hole puncture
- No recurrent stenosis or multiple dilatations
- Stimulation of the nurse's curiosity and their vigilance
- Reduced costs for patient hospitalisation and care

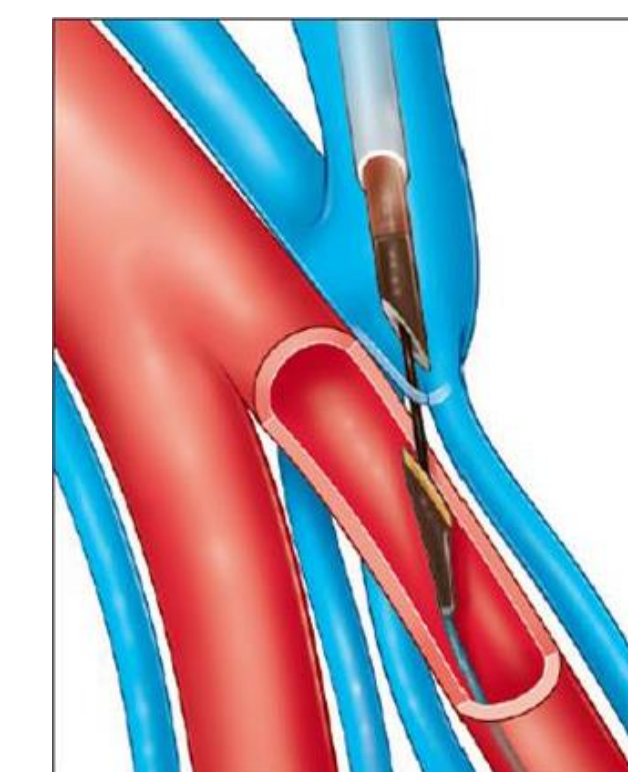
## Conclusion

This new and innovative technique for the creation of percutaneous AVF guarantees a safe and efficient vascular access for haemodialysis, which is faster to use and scar-free. This technique provides a low risk of complications, better preservation of vascular access in short and long term, and high patient satisfaction. Increased motivation of the medical and paramedical teams, because it facilitates the cannulation of arteriovenous fistulas and monitoring.

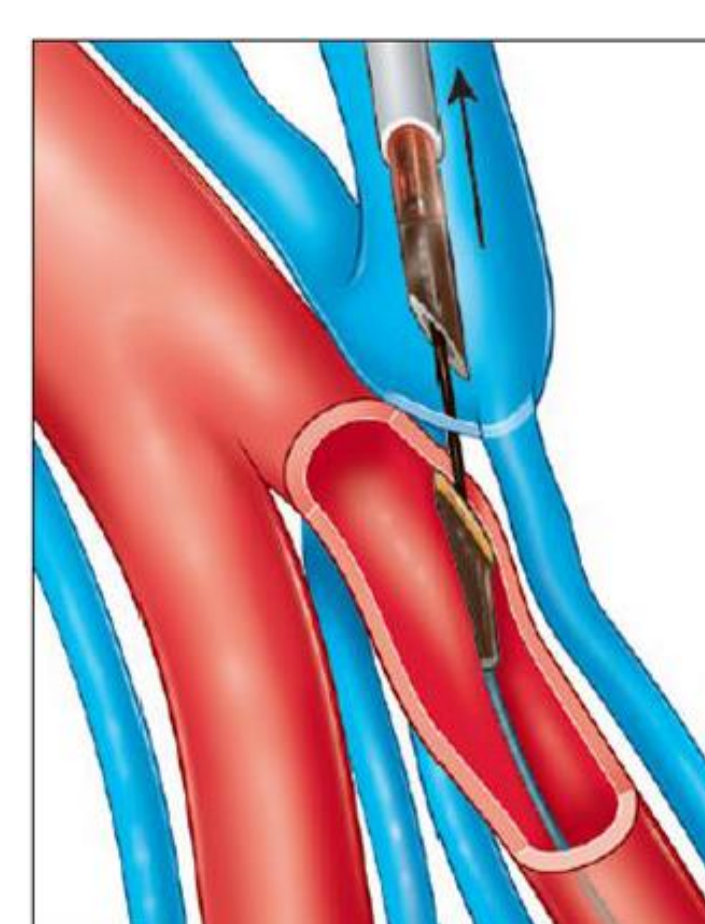


1. Under ultrasound guidance, a micro-puncture needle is used to access the deep communicating vein.

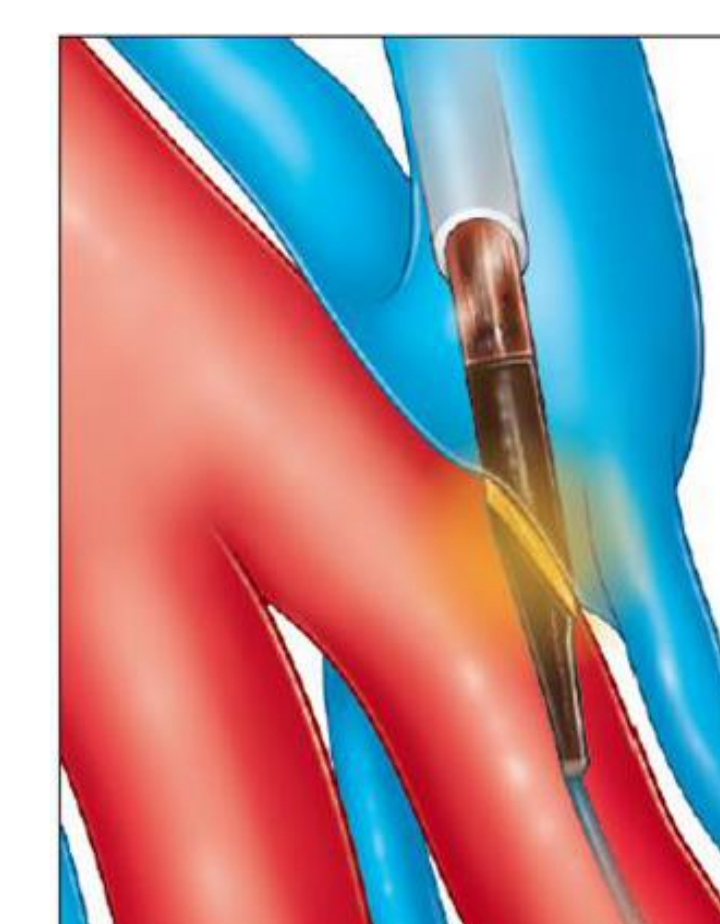
2. The needle is advanced into the radial artery (RA) allowing the placement of a guidewire into the artery. The needle is removed and an access sheath is advanced into the RA (not shown).



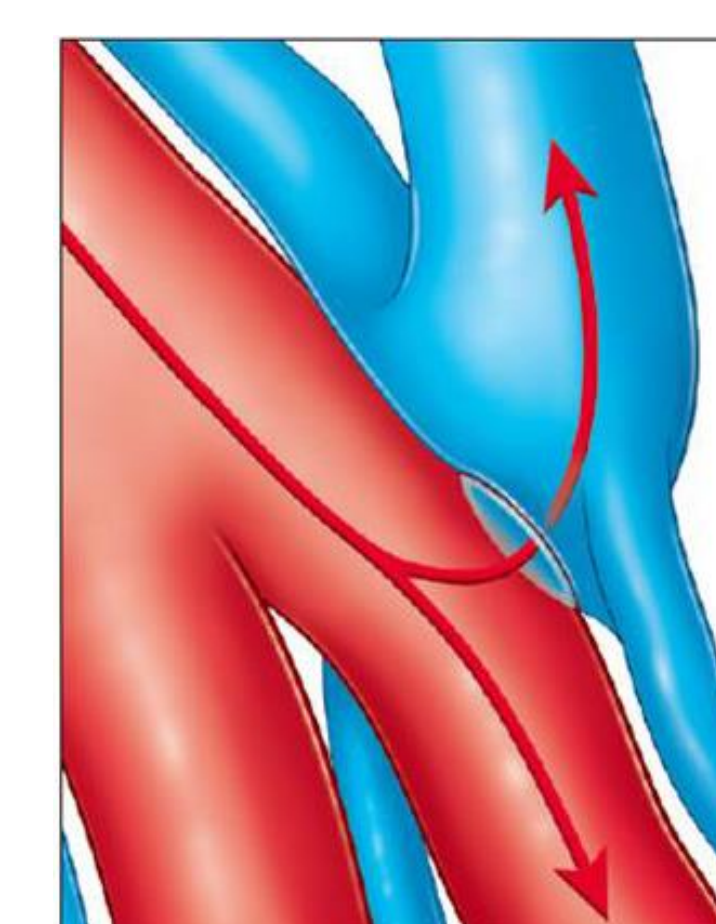
3. The Ellipsis catheter is advanced over-the-wire until the catheter tip is positioned within the RA.



4. Light tension is applied to the catheter to ensure the tip is seated against the arterial wall.



5. The catheter is closed and activated, creating a fused and permanent anastomosis. No implants required including suture.

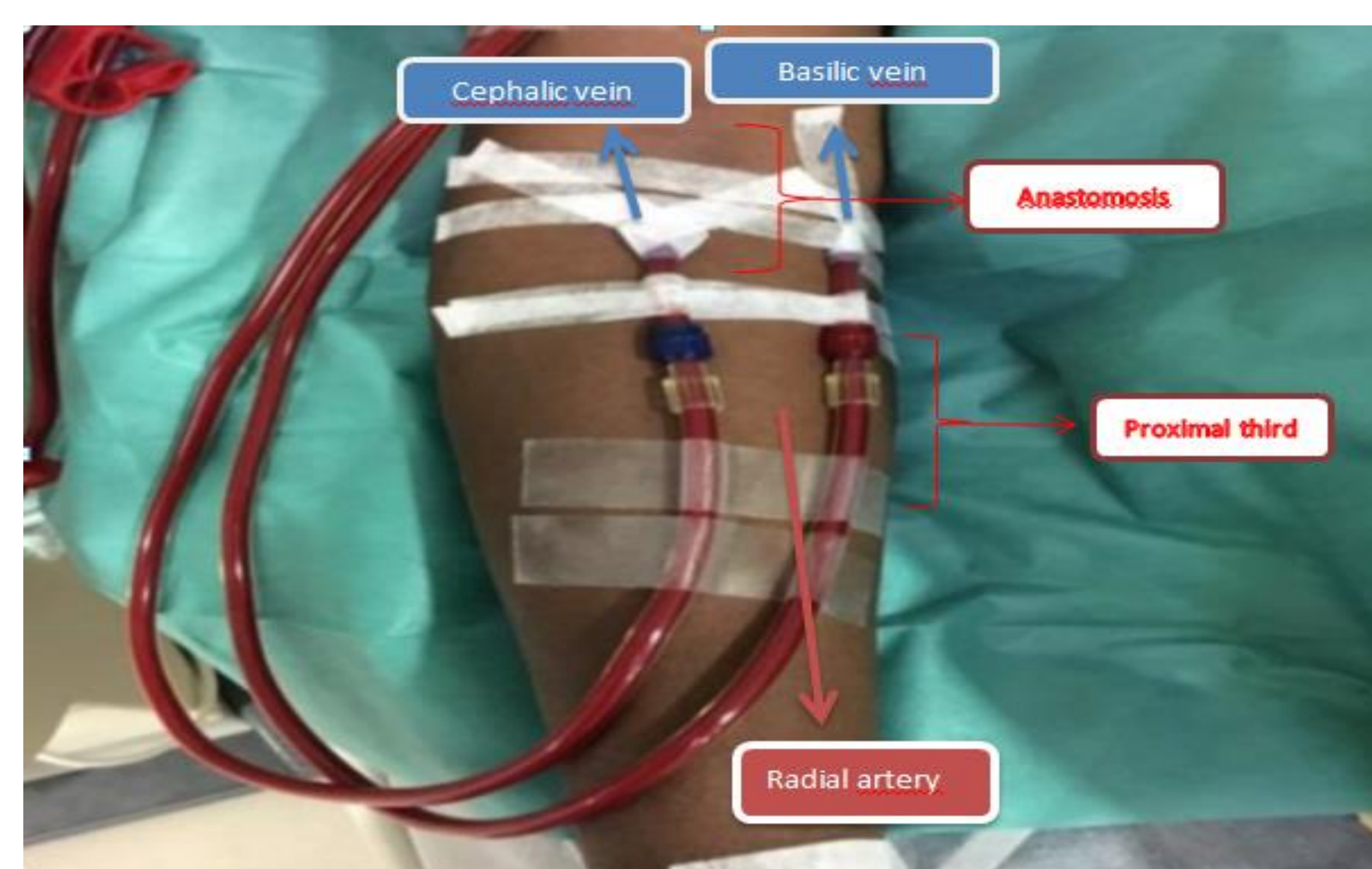


6. Catheter is removed resulting in AVF flow.

## Illustration of the thermofusion technique

	Classic AVF	Percutaneous AVF
1.Skin	Scar of visual anastomosis	No scar
2.Anatomy	All types of proximal and distal fistulas	Proximal radiocephalic
3.Post-surgery flow	Variable, small or normal flow	Immediate, about 800 ml-1L
4.Use	4 to 5 weeks post surgery	Possible from J5
5.Post operative	Scar dressing, sometimes necessary superficialization of proximal AVFs	No dressing after surgery, no cutaneous opening
6.Puncture	Random on the same path, risk of blood recirculation	Puncture of 2 veins that have independent drainage without blood recirculation
7.Cost	Surgery, dressing care and traitement of complications	Cost of material

## Comparative table



Use of percutaneous AVF during a dialysis session