

DUPLEX ULTRASOUND AND ARTERIOVENOUS GRAFTS: PREOPERATIVE MAPPING AND POSTOPERATIVE SURVEILLANCE

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Background

Hemodialysis vascular access dysfunction is responsible for more than 40% of the hospitalizations among patients with end-stage kidney disease¹. Especially synthetic grafts (AVGs) are associated with an increased rate of morbidity, mortality and cost of health care. Thus, to improve the managing of the vascular access and to avoid the complications related, several protocols have been performed. According to the data reported in the literature the average primary patency rate of a AVG is approximately 10 months². Periodic monitoring of vascular access with duplex ultrasound has been demonstrated to be able to identify early access dysfunction, thus anticipating surgical intervention and improving its long-term survival³.

Purpose

To underlay the application of duplex ultrasound in the surveillance and endovascular treatment of AVGs' complications.

Methods

Data of this study were collected retrospectively from 1997. During fifteen years (185 months) of follow-up, we have placed 171 synthetic grafts in 138 patients at our institution. Nowadays we are following a protocol based on monthly ultrasound monitoring of the AVGs (Fig.1), it even provides, when necessary, a prompt intervention by PTA and mechanical thrombolysis, both ultrasound guided (Fig 2 and 3).

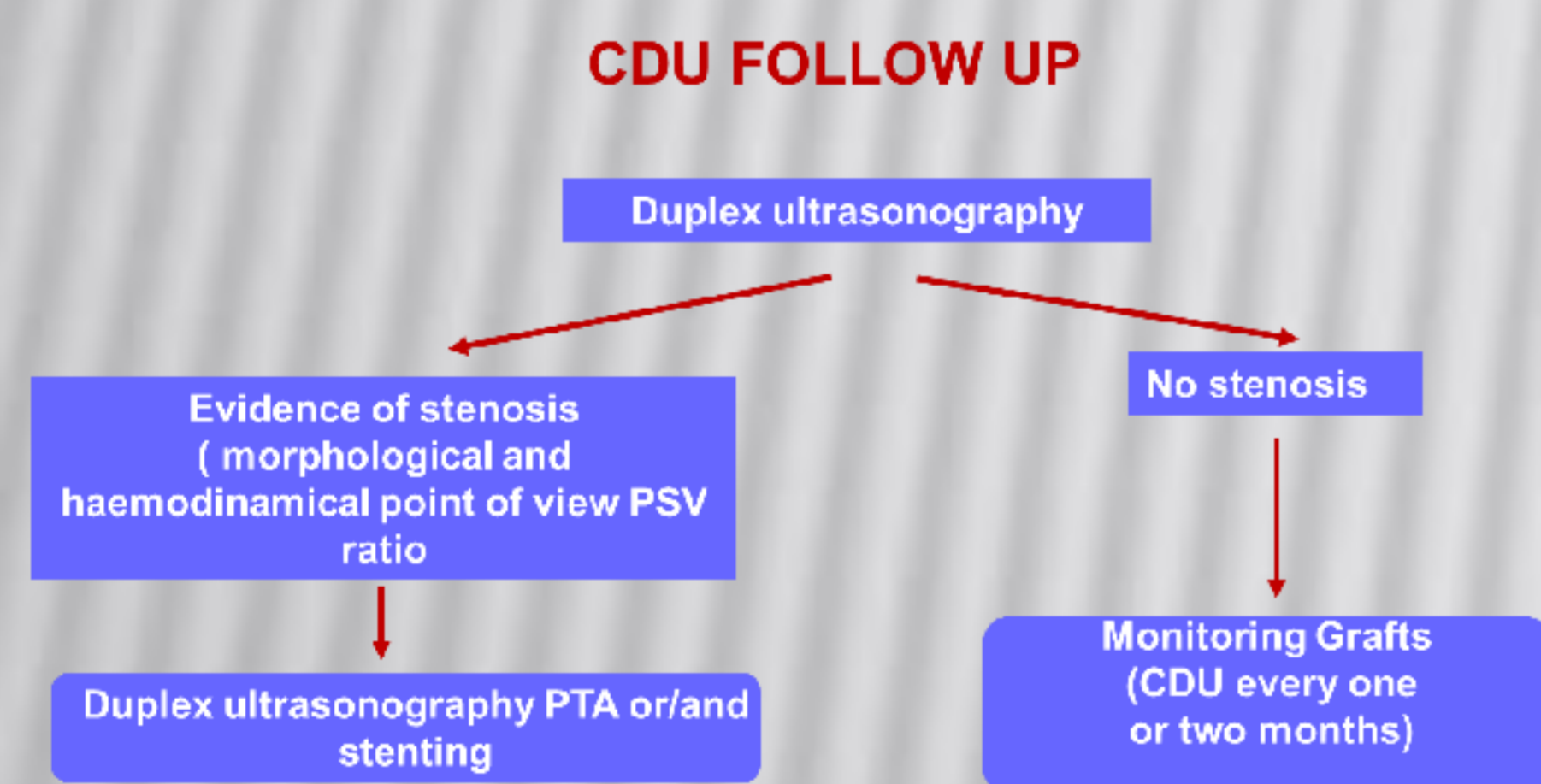


Fig.1 CDU follow up

Results

59% of the grafts were placed in the forearm, 40% in the arm, 1% in the thigh. We used different types of grafts: PTFE (36%), modified PTFE (51%), bovine (12%) and polycarbonate (1%) (see the Table below).

17 grafts (9.94%) have gone on early failure (within 30 days of the surgery) due to patient or surgical complications. In the remaining 154, the mean primary and secondary patency rates were 21.2 months and 29.8 months respectively. To obtain these results, we performed 607 ultrasound guided PTA (3.54 for each graft). In 59 cases the PTA has been associated with the placement of one or more stents and in 129 cases we used the cutting balloon. Furthermore, with ultrasound guided technique, we carried out 90 thrombolysis. All the procedures were performed in outpatient surgery.

Patients population		
Location of AVGs	Forearm	59%
	Arm	40%
	Thigh	1%
Type of AVGs	Modified PTFE	51%
	PTFE	36%
	Bovine	12%
	Polycarbonate	1%

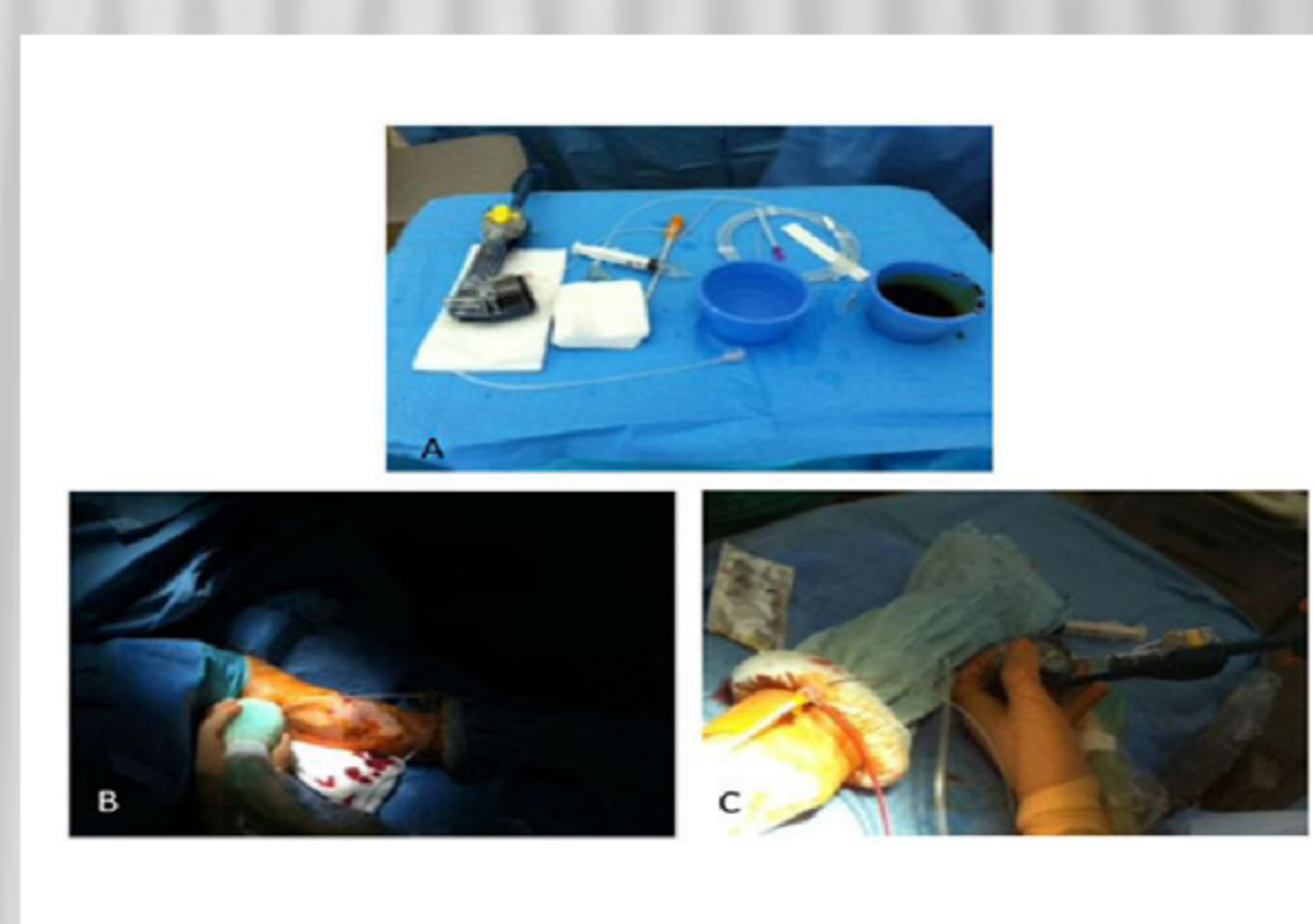
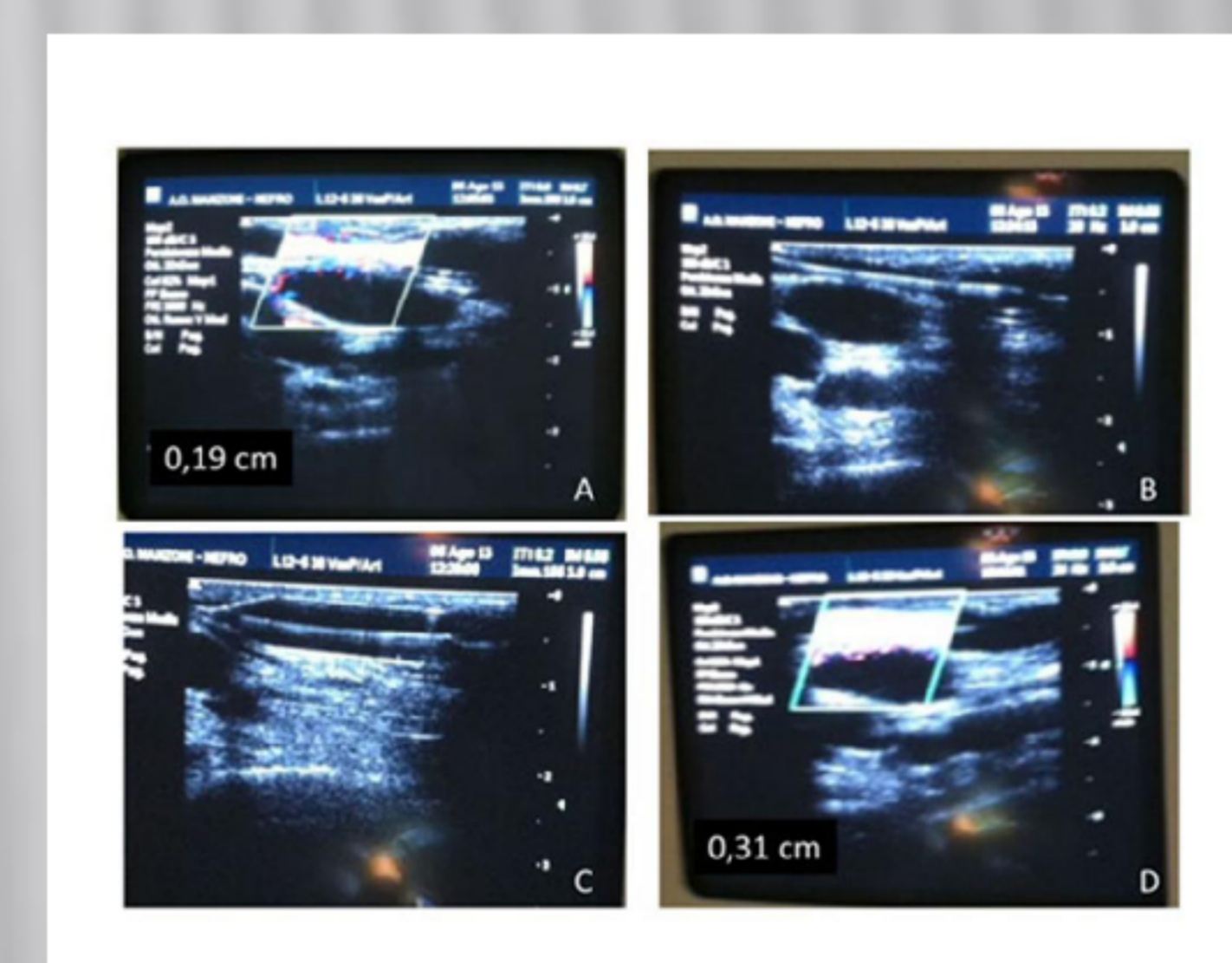


Fig.2-3 PTA performed under ultrasound guidance



Conclusions

The application of the duplex ultrasound in the endovascular surgery and follow up of the AVGs represents a useful and safe policy for the patients and an economical one for the health care system (it doesn't require patients' hospitalization). This study should emphasize the role of duplex ultrasound: preoperative, for the vascular mapping and postoperative, for the surveillance of the AVGs, early diagnosis and prompt treatment of the complications.

References

1. Eggers PW from Presentation at Cincinnati Hemodialysis vascular access Symposium 2004
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3. Bacchini G et al. *Color Doppler ultrasonography percutaneous transluminal angioplasty of vascular access grafts.* J Vasc Access 2007; 8: 81-5

