



UNIVERSITY "SS. CIRYL AND METHODIUS"
MEDICAL FACULTY, CLINIC OF NEPHROLOGY
SKOPJE, R. N. MACEDONIA



HELLENIC SOCIETY OF NEPHROLOGY MEETING & SEMINAR

Combined with:

18th BANTAO CONGRESS

October 19-22, 2023

Makedonia Palace Hotel THESSALONIKI, GREECE



PROLONGED DURATION OF VASCULAR ACCESS FOR HEMODIALYSIS

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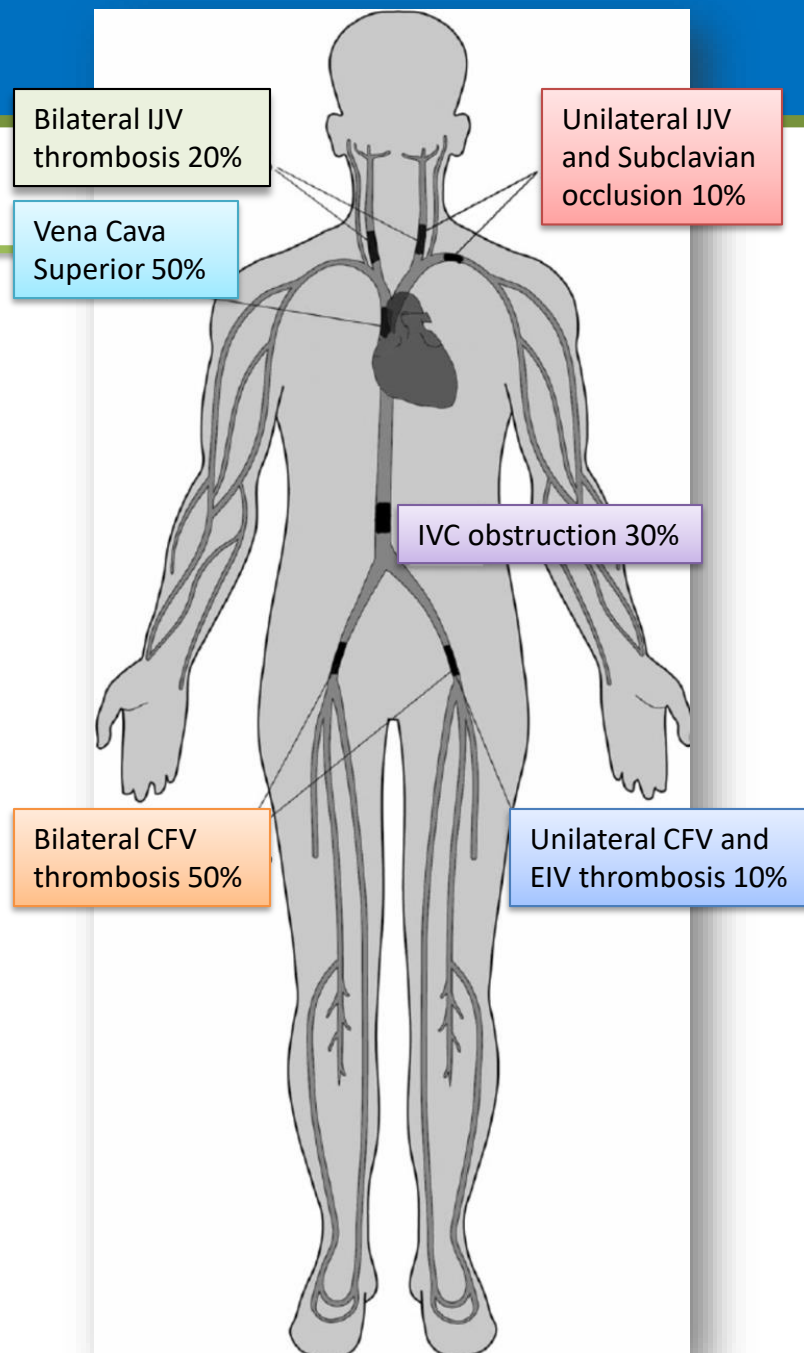
INTRODUCTION

The number of patients with Renal replacement therapy per year for
R. N. MACEDONIA (2002 – 2022)



Vascular access for hemodialysis

- Common site and frequency (%) of venous obstruction in hemodialysis (HD) patients.
- Due to the complications of conventional vascular access (VA) for HD, the great challenge is to solve them by using other VA.
- The creation of VA for patients on HD is a great challenge in vascular surgery regarding chronic renal failure (CRF).
- A permanent VA is the life saving procedure in HD patients.



The aim of the study

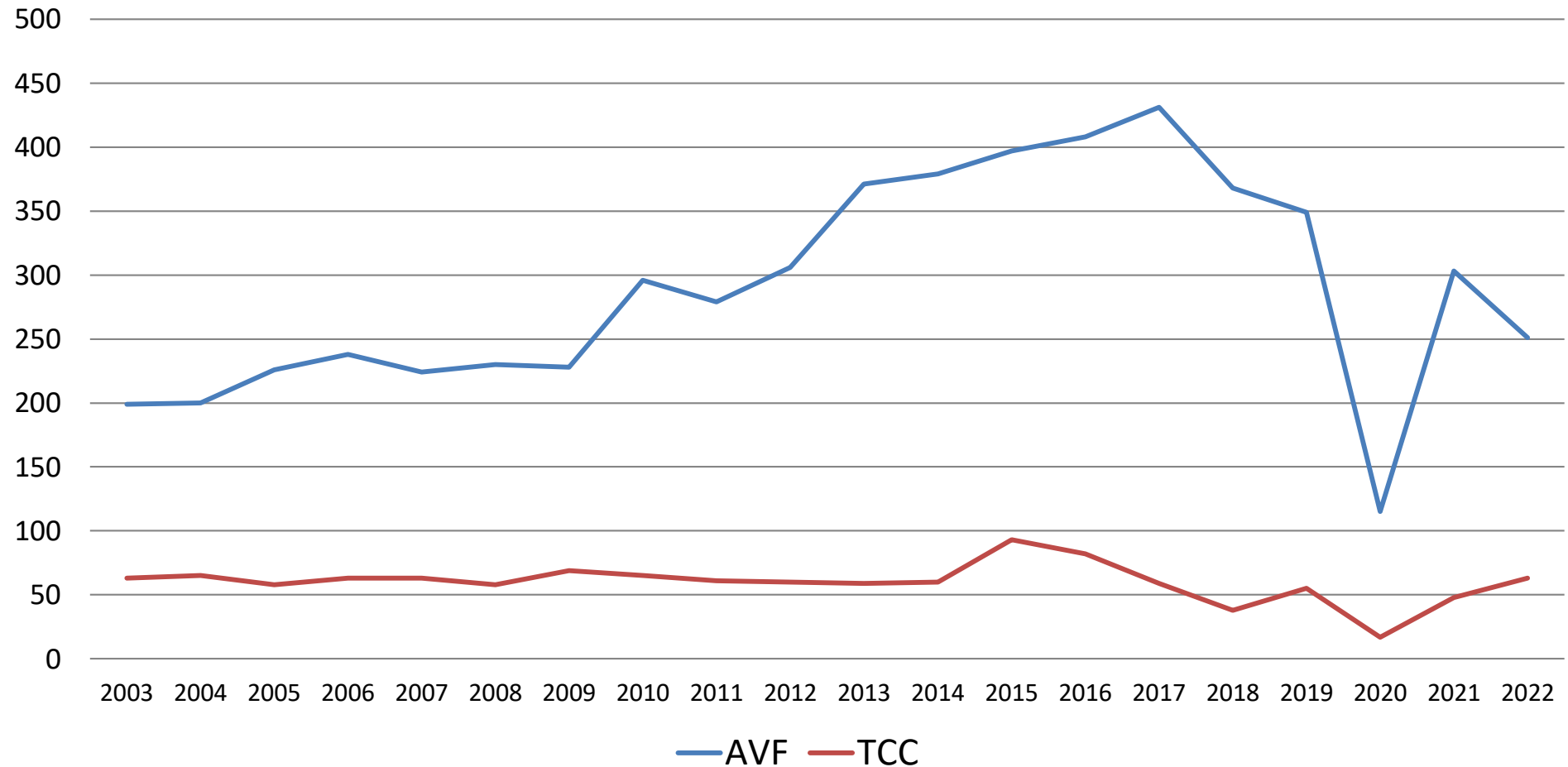
To present our experience in creation of VA modalities for HD as procedures related to prolonged duration with less complications in clinical practice.

MATERIAL AND METHODS

A NUMBER OF CASES OF VA FOR HD 2003 - 2022

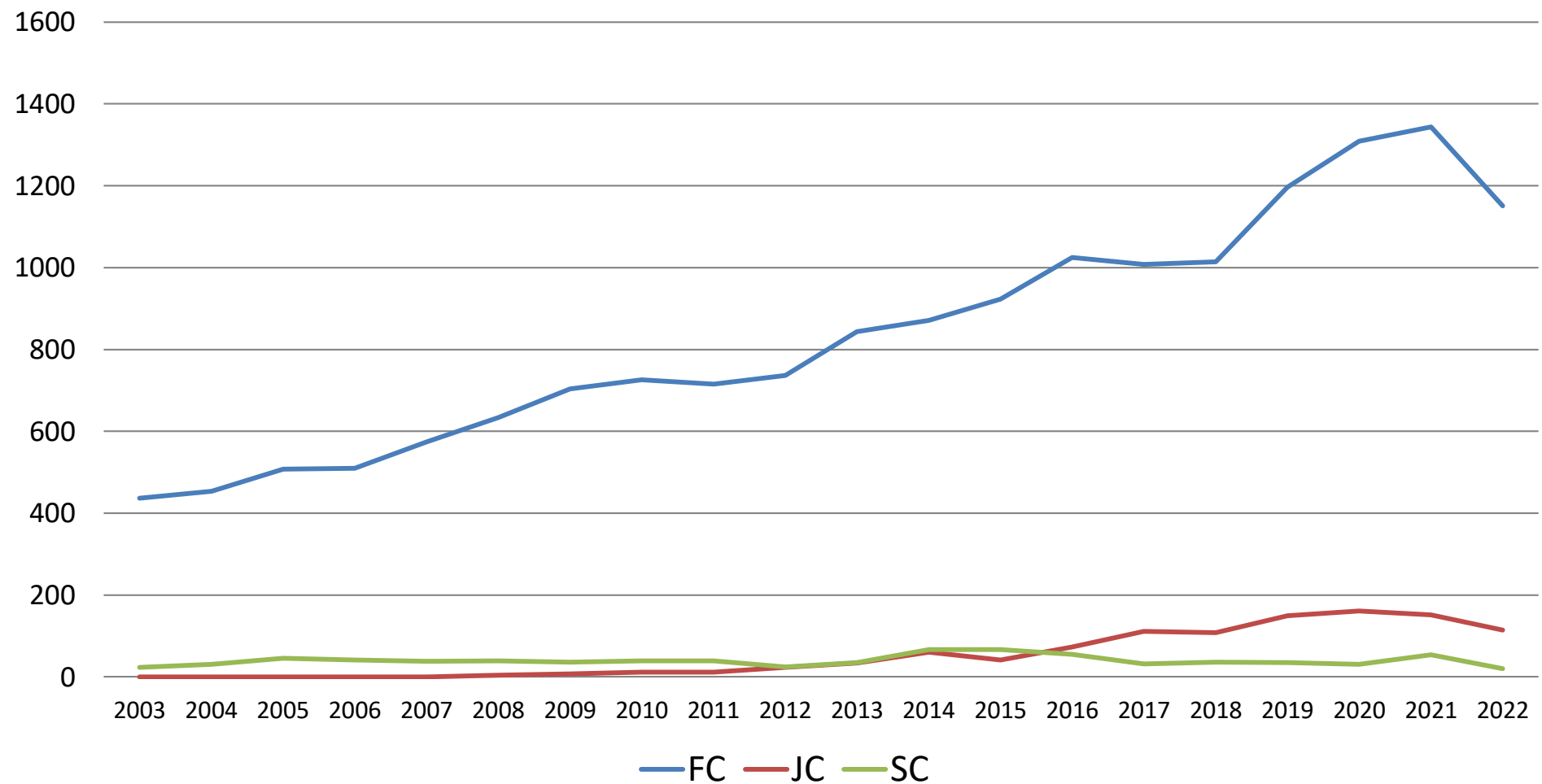
VA	Number of cases
Permanent VA	
AVF	5798 (83%)
TCC	1199 (17%)
Temporary VA	
FC	16682
JC	787
SC	1066
TOTAL	25532

Permanent VA for HD at our Clinic (2003-2022)



AVF – arteriovenous fistula; TCC – tunneled central catheters;

Temporary VA for HD at our Clinic (2003-2022)



FC – femoral catheter; JC- jugular catheter; SC – subclavian catheter

Type of used catheter regarding different issues, insertion and removal

Issues	Types	Insertion	Removal
Lumen numbers	Single Dual	<ul style="list-style-type: none"> • Seldinger technique 	<ul style="list-style-type: none"> • AVF maturation
Lasting period	Temporary Permament	<ul style="list-style-type: none"> • strict aseptic condition 	<ul style="list-style-type: none"> • infection (CRB – catheter related bacteriemia:
Ruth location	Femoral Sublavian Jugular	<ul style="list-style-type: none"> • in local anasthesia • 2% chlor-hexidine • occlusive dressing 	<ul style="list-style-type: none"> • fever >38,5 °C, leucocytosis, >CRP, identical micro-organism type in blood and on catheter tip)
Used material	Polyurethan Silicon		
Catheter lenght	15cm 20cm 24cm		<ul style="list-style-type: none"> • inadequate blood flow

Conventional AVF protocol

AVF protocol characteristics	
Anastomosis type	Latero-terminal (5-6cm)
Anastomosis location	Wrist (between radial artery and cephalic vein)
Time of anastomosis creation	IV – V stage of renal insufficiency
Required pre-condition	No cannulation of veins prior AVF creation
Required check	Doppler mapping of blood vessels
Recommended action	Hand muscle exercise
Surgery protocol	Use of loupes, A/V dilatation, vein preparation <3cm

RESULTS and DISCUSSION

TYPES OF VA MODALITIES FOR HD RELATED TO DURATION 2003 - 2022

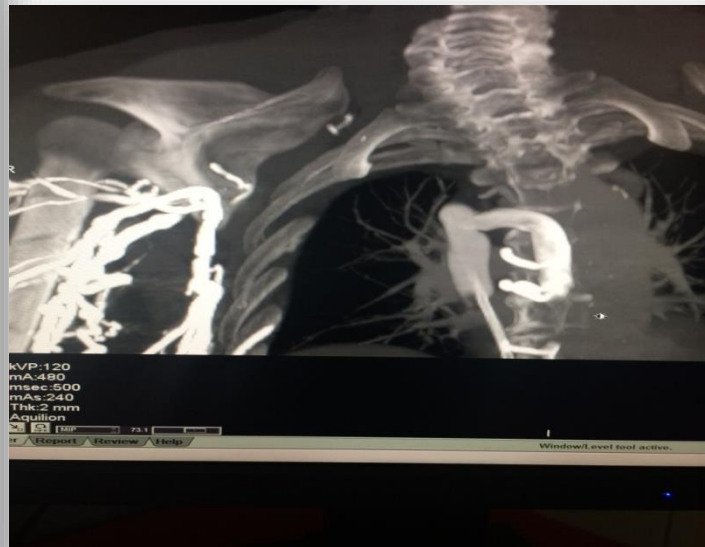
VA modalities	Number of cases	F	M	Duration
Femoral artery cannulation	15	10	5	< 3 weeks
Necless AV graft	1	1	0	< 1 month
Sapheno-femoral AV graft	2	2	0	< 1 year
V. Azygos cannulation	3	3	0	< 3 years
Translumbar cannulation of VCI	3	3	0	< 3 years
Bypass from BCV to RA – graft &Thesio II	1	1	0	< 4 years
Aneurysmorrhaphy	30	19	11	< 5 years

Indications for VA for HD in our patients

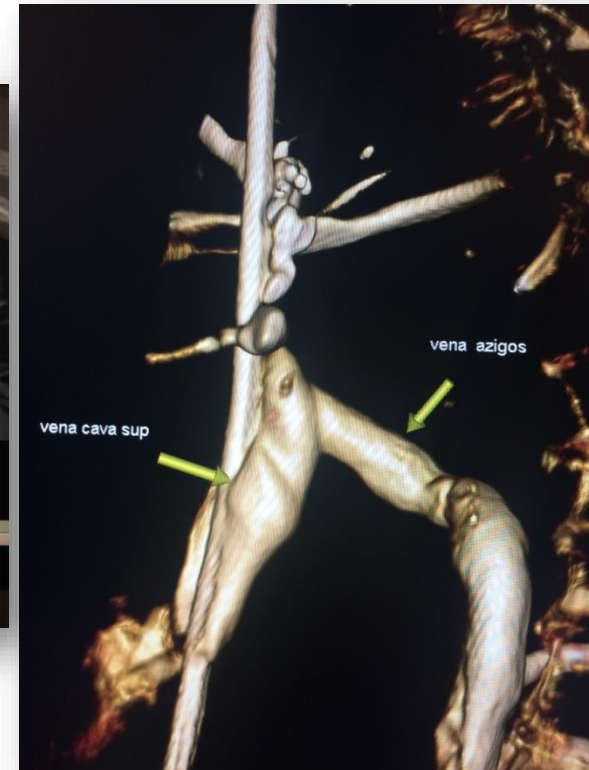
Bilateral stenosis on
v. femoralis and
v. iliaca interna



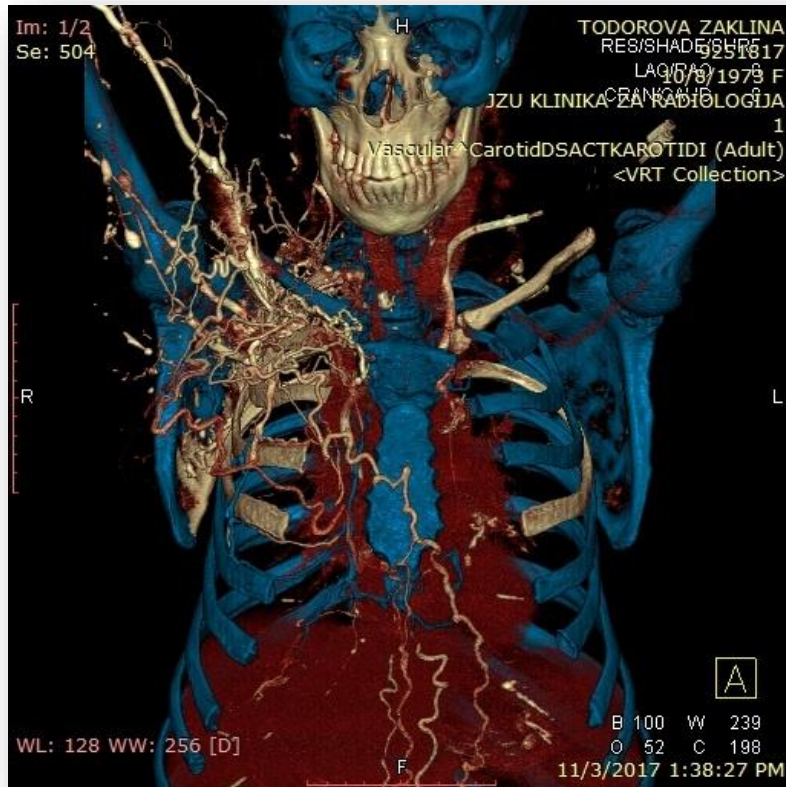
Tortuous intercostal veins
and v. azygos (enlargement)



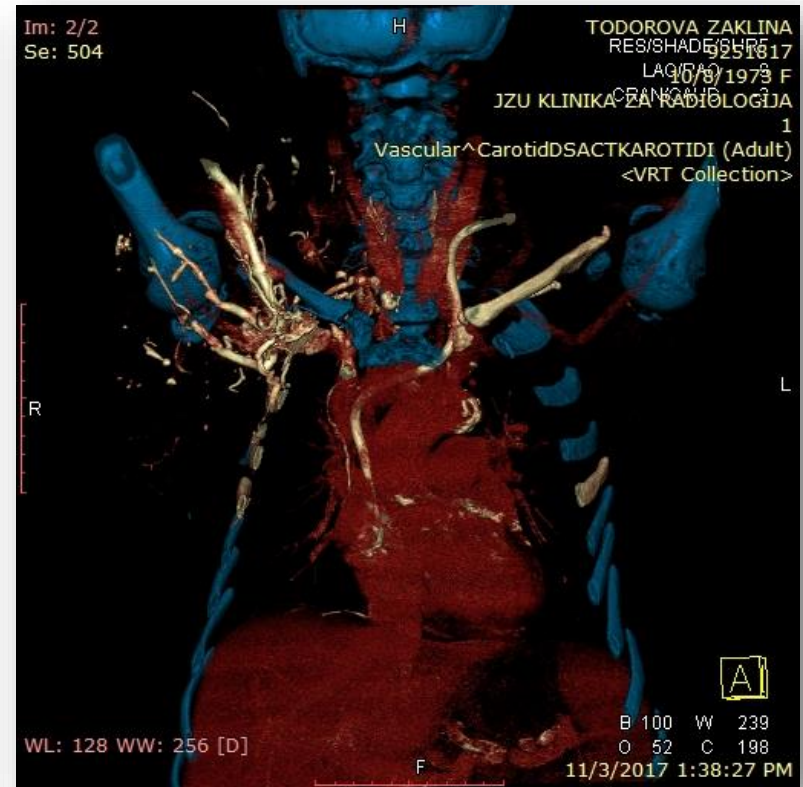
Stenosis of v. cava
superior and thrombotic
mass at right atrium



Indications for cannulation of IJV and SCV

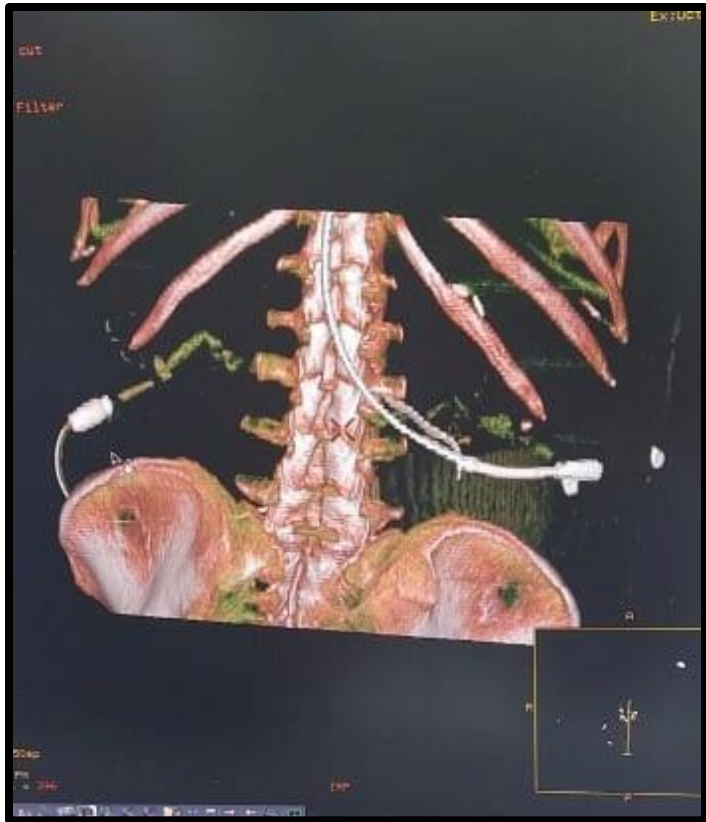


Collateral circulation due to stenosis of v. subclavia



Thrombotic masses in right atrium

Translumbal cannulation of VCI

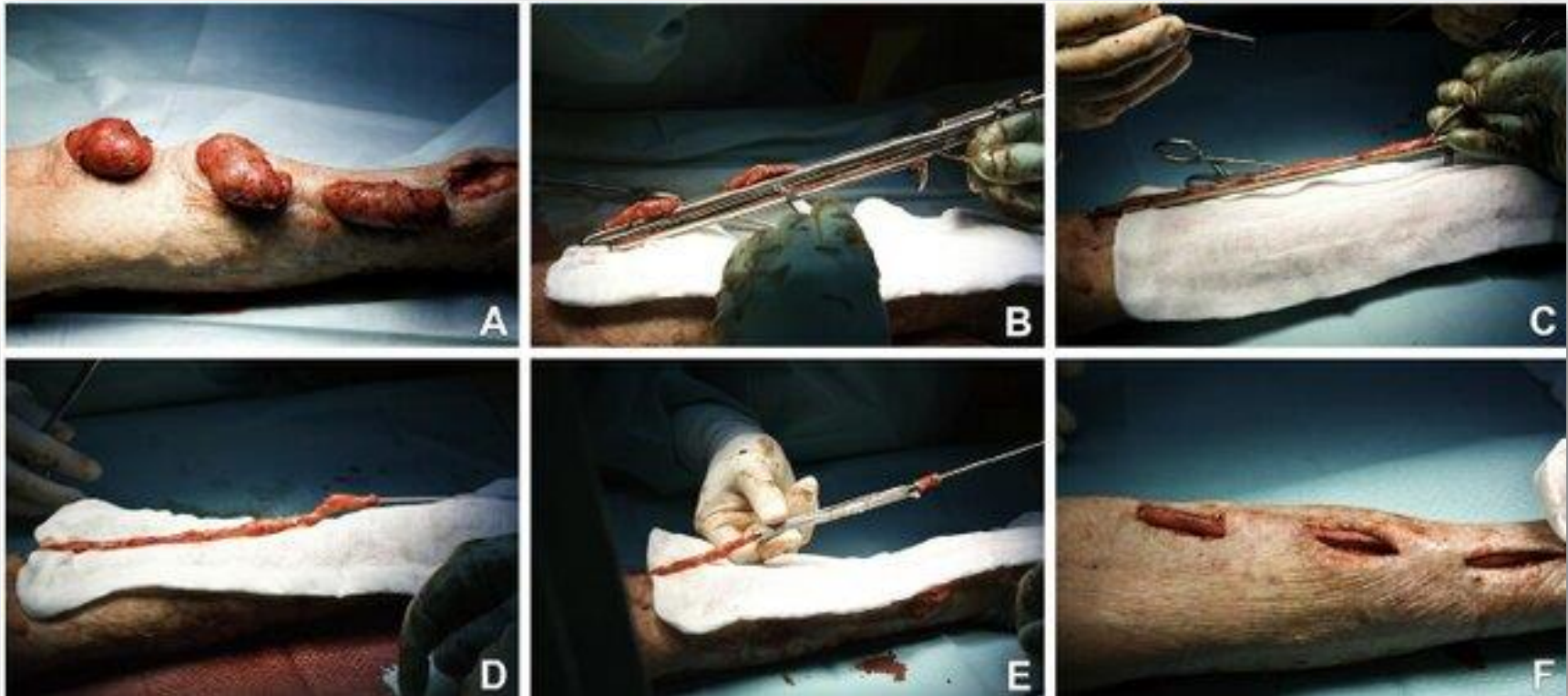


Placement of permanent translumbar catheter in VCI



Performing HD through translumbar catheter

Reinforced aneurysmorrhaphy technique



- (A) Venous arm of the fistula mobilised up to the non-dilated part of the vein;
- (B) Resection of aneurysms using BalRok clamp;
- (C) Vein wall remaining after aneurysm resection sewn with a continuous running suture;
- (D) Repaired vein after aneurysmorrhaphy;
- (E) Implantation of external mesh prosthesis;
- (F) Repaired vein tunnelled subcutaneously and reanastomosis.

AVF characteristics and surgical indications

Variable	<i>n</i> (%)
Type of AVF	
Forearm	
Radial-cephalic fistula	39 (63)
Ulnar-cephalic fistula	1 (2)
Upper arm	
Brachial-cephalic fistula	15 (24)
Brachial-basilic fistula	7 (11)
AVF characteristics	Mean ± SD (range)
Number of aneurysms	2.33 ± 0.57 (1.00–3.00)
Maximum aneurysm diameter (mm)	34.47 ± 7.33 (20.00–55.00)
AVF survival (y)	9.03 ± 6.07 (2.00–29.00)
Indication	<i>n</i> (%)
High-flow AVF	24 (39)
Pain overlaying skin	15 (24)
Progressive enlargement	12 (19)
Bleeding	5 (8)
Steal syndrome	3.0 (4.5)
Stenosis	2 (3)
Thrombosis	1.0 (1.5)

Postoperative complications after aneurysmorrhaphy

COMPLICATIONS	NUMBER OF PATIENTS	% OF PATIENTS
Bleeding	3	10
Hematoma	2	6.66
Infection	1	3.33
Dermal necrosis	1	3.33
Temporary catheterization for HD	4	13.3

CONCLUSION

- ❑ Due to the complications after conventional used access for HD, we have performed: a. femoralis, v. azygos, sapheno-femoral AVFs, translumbar cannulation of VCI, bypass from VBC to RA with graft, Thesio-catheter insertion, and aneurysmorrhaphy.
- ❑ Aneurysmorrhaphy may be an effective method for treating aneurysmal AVF, showing excellent long term patency, no aneurysmal recurrence, and a minimal infection rate. It appears to be suitable for high flow AVF.
- ❑ The used modalities succeeded to prolong VA duration and improve HD patients' longevity and quality of life, thus they may be used as last life saving procedures in CRF.



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THANK YOU FOR YOUR ATTENTION!