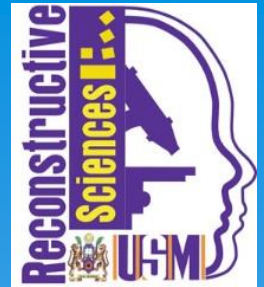




**4<sup>th</sup> Annual Scientific Meeting  
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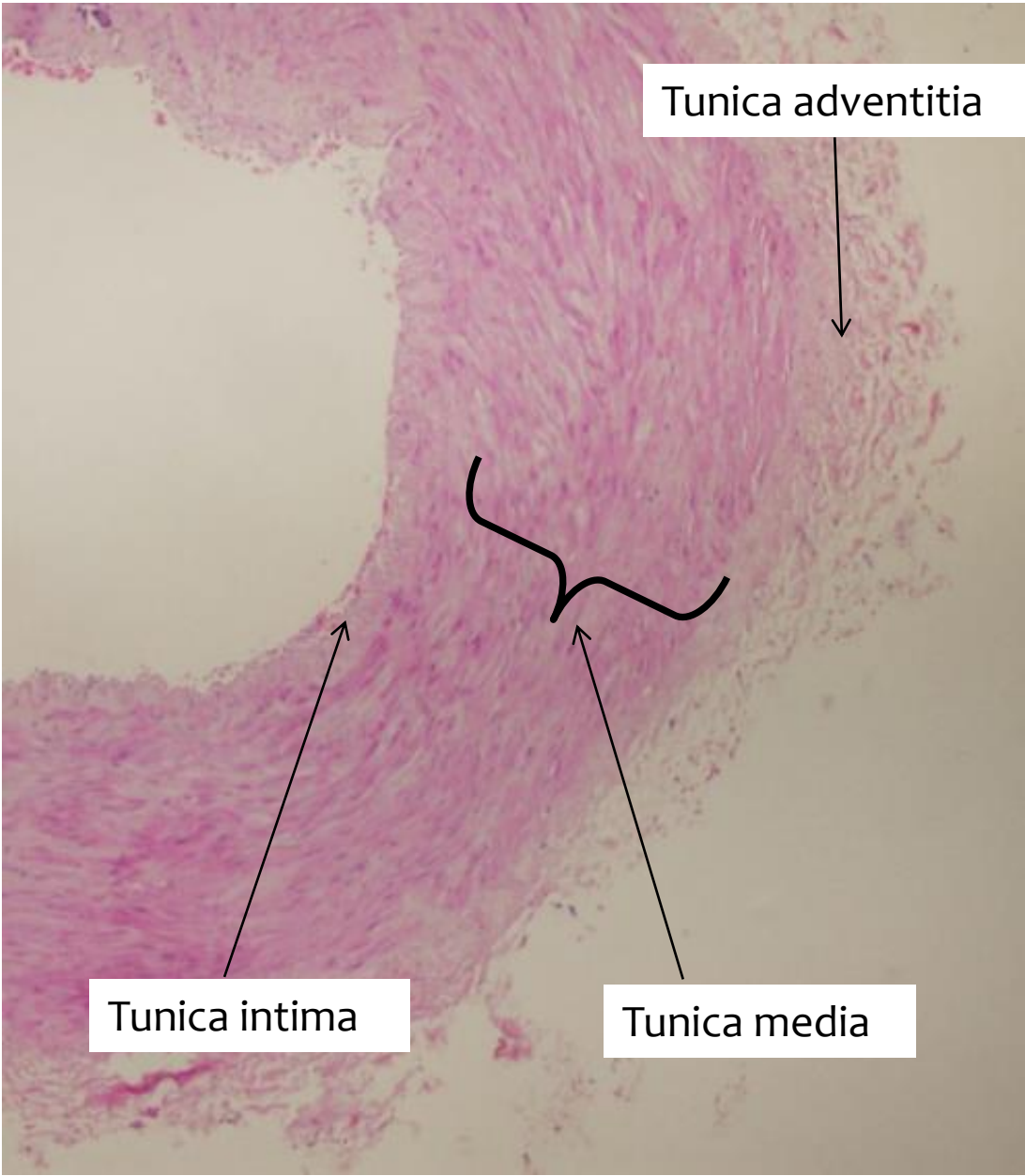
**MICROCALCIFICATION IN TUNICA  
INTIMA AND MEDIA OF THE ARTERY,  
IS IT A THREAT TO ARTERIOVENOUS  
FISTULA SUCCESS?**

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# INTRODUCTION

- \* CKD patients are associated with microcalcification of the artery
- \* Tunica intima microcalcification may lead to ischaemia-related occlusion
- \* Tunica media microcalcification (Monckeberg's sclerosis) may lead to vessel stiffness
- \* Success or failure of the fistula is related to:
  - \* Patient's factor
  - \* Surgeon's factor



Tunica adventitia

Tunica intima

Tunica media

## **Objectives:**

- \* Success rate in a single center
- \* To determine whether microcalcification in the tunica intima and / or media is associated with failure of the arteriovenous fistula
- \* To identify factors related to non-maturing arteriovenous fistula

## **Hypothesis**

- \* Microcalcification in tunica intima and media is associated with arteriovenous fistula failure

# METHOD

- \* Observational prospective cohort study
- \* Duration: 1<sup>st</sup> January 2016 -31<sup>st</sup> December 2016
- \* Centre: Hospital Universiti Sains Malaysia
- \* 138 participants was included in the study based on the inclusion and exclusion criteria as below:

## **Inclusion criteria:**

- \* Patient age 18 years old and above
- \* CKD stage IV-V
- \* Ultrasonographical vein diameter of > 2 mm and arterial diameter of > 2 mm

## **Exclusion criteria:**

- \* Prosthetic arteriovenous graft creation

Preoperative clinical assessment by a single surgeon



Specimen of 3-5mm diameter, circular shaped arterial wall (obtained from arteriotomy)



Arterial wall is being assessed by a single pathologist who is blinded to the clinical data

Stained with Von Kossa staining



Follow up of fistula at 6 weeks –  
Maturation of fistula is being assessed



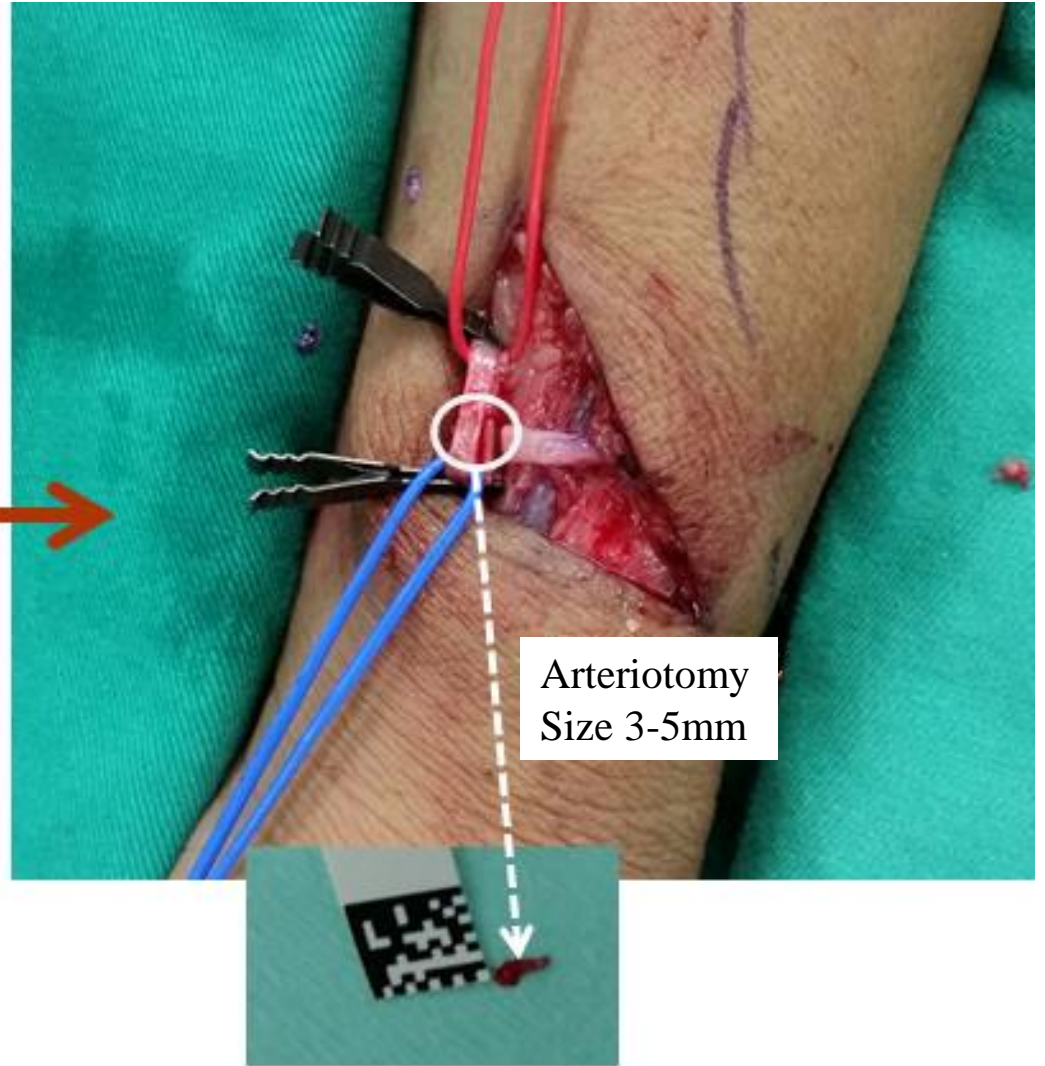
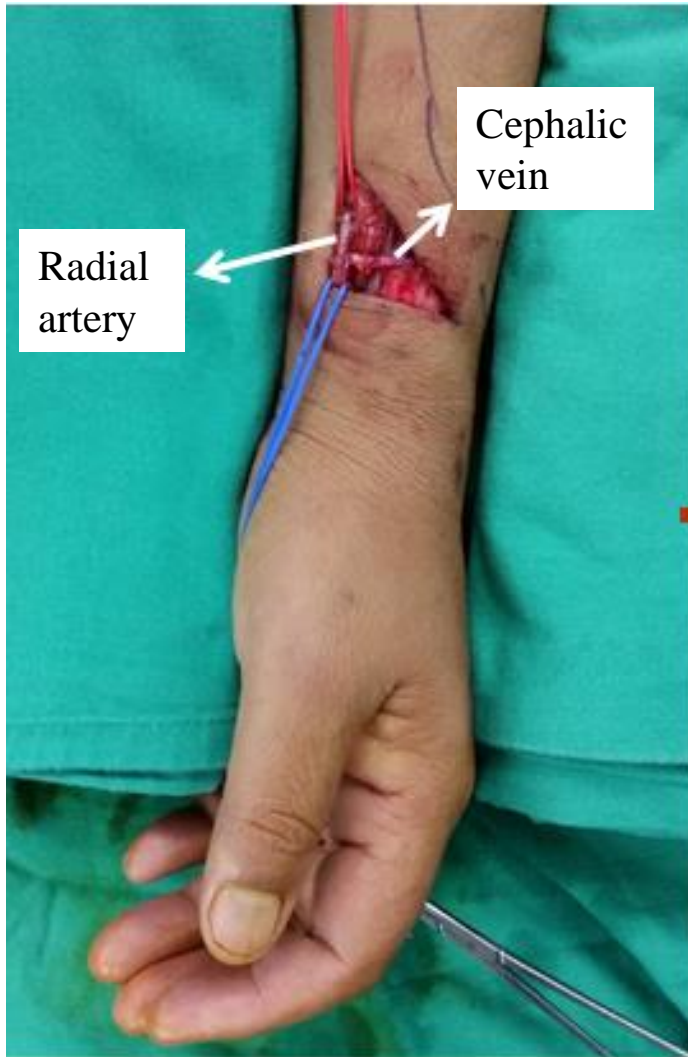
Matured fistula



Failed fistula

- **Maturation: rule of 6's** (National Kidney Foundation, 2006)
  - 6 mm diameter margins
  - 6 mm or less in depth
  - 6 cm straight segment for cannulation
  - 600 ml/min blood flow
  - Fistula to be assessed by post operative 6 weeks for maturation

\* Statistical analysis was performed using Pearson chi square.  $P < 0.05$  was considered statistically significant





# RESULTS

	Number	Percentage (%)
<hr/>		
<b>AVF creation</b>		
Matured	110	79.7%
Failed	28	20.3%
<b>Tunica intima microcalcification</b>		
Present	42	30.4%
Absent	96	69.6%
<b>Tunica media microcalcification</b>		
Present	17	12.3%
Absent	121	87.7%

## Demographic data

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<b>Mean age</b>	57.09 $\pm$ 11.71	
<b>Gender</b>		
Male	74	53.6%
Female	64	46.4%
<b>Ethnics</b>		
Malay	135	97.8%
Chinese	3	2.2%
Indian	0	0%
<b>Medical illness</b>		
Diabetes mellitus	99	71.7%
Hypertension	132	95.7%
Coronary heart disease	29	21%
Others	29	21%
<b>Chronic kidney disease</b>		
Stage 4	26	18.8%
Stage 5	112	81.2%
<b>Type of dialysis before surgery</b>		
Peritoneal dialysis	17	12.3%
<u>Hemodialysis</u>	95	68.8%
None	26	18.8%

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**Arteriovenous fistula maturation**

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**Matured AVF**  
**N(%)****Failed AVF**  
**N(%)****Chi-square**  
**(df)*****P*-value**

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**Tunica intima  
calcification**

Present

35 (83.3)

7 (16.7)

0.49 (1)

0.484

Absent

75 (78.1)

21 (21.9)

**Tunica media  
calcification**

Present

16 (94.5)

1 (5.9)

2.48 (1)

0.115

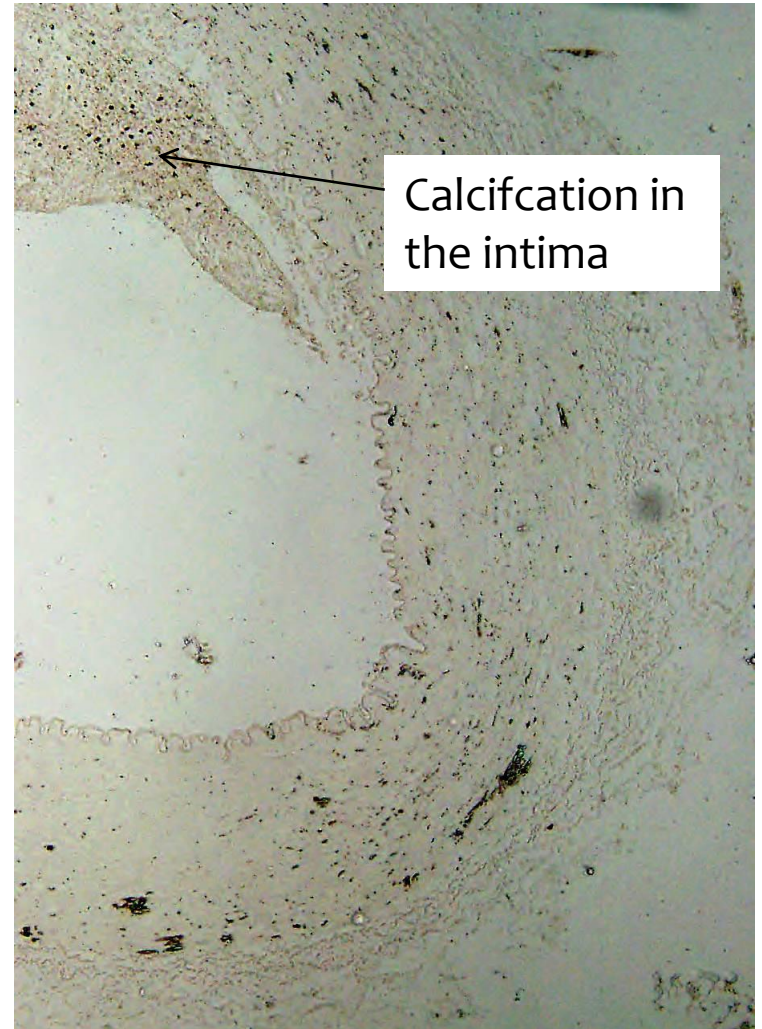
Absent

94 (77.7)

27 (22.3)

Analysed using Pearson chi-square (SPSS version 22)

# Von Kossa staining



# DISCUSSION

- \* Calcification in the tunica intima and media is not statistically significant in affecting maturation of the fistula.
- \* Possible association with other patient factors
- \* Surgical skill, careful patient selection, and preoperative evaluation of vascular anatomy contribute to success of AVF maturation

## Limitations

- \* Vascular samples obtained might be too small to be representative of entire artery
- \* Non-randomised study
- \* Population is heterogenous with different fistula site creation and multiple co-morbid

# CONCLUSION

- \* Microcalcification in the tunica intima and media of the artery does not affect the maturation of the AVF

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**THANK YOU**