

Renal biopsy audit of Double Transplant recipients spanning 40 years

Julia Low

Sydney, St Vincent's Pathology, Sydney



The 48th Annual Scientific Meeting *of the*

Australasian Division of the
International Academy of Pathology

Disclosure of Relevant Financial Relationships

No relevant financial relationships

Audit premise

St Vincent's is celebrating 40 years of heart/lung transplantation.

Over the 40 years, a total of 2640 heart or lung transplants have been performed at St Vincents, Sydney (ANZOD registry)

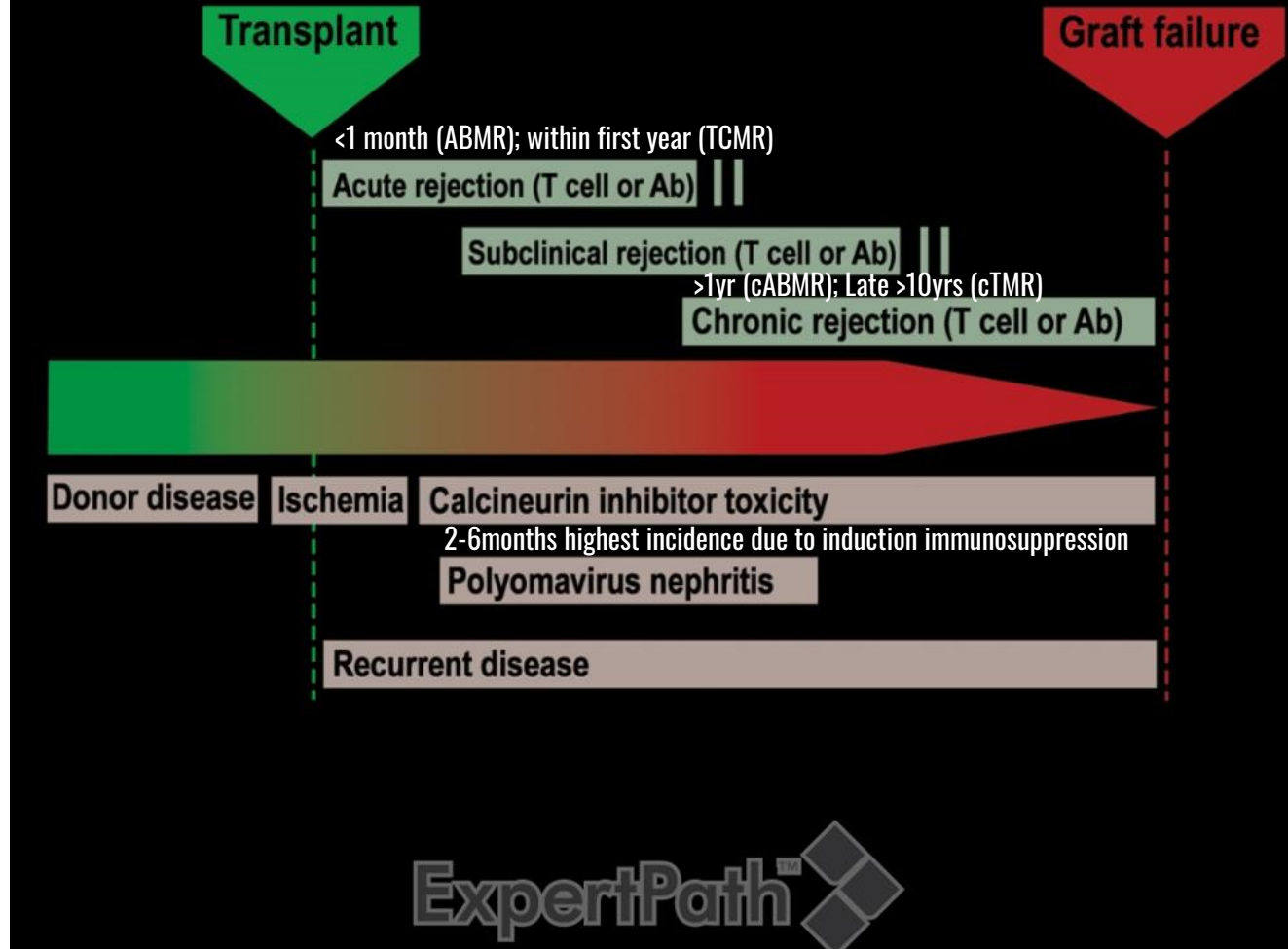
This is an audit of renal pathology biopsies within the population of kidney plus heart or lung transplant recipients over the past 40 years.



Identifying cohort numbers

- ANZDATA identified 41 sequential kidney or kidney/lung or kidney/heart transplants in 37 patients following heart/lung transplant in Australia.
- ANZDATA identified 27 patients who have had either a concurrent heart/lung and kidney transplant, or sequential kidney transplant on a background of previous heart/lung transplant at St Vincent's hospital Sydney. *(Incomplete data)*
- ANZOD and St Vincent's operation report data base identified another 4 cases of sequential kidney transplants *(after having had a previous lung transplant)*
- Our pathology database captures pathology from 2010 onwards only (Excluding 14 cases)

Time Course of Events in a Renal Allograft

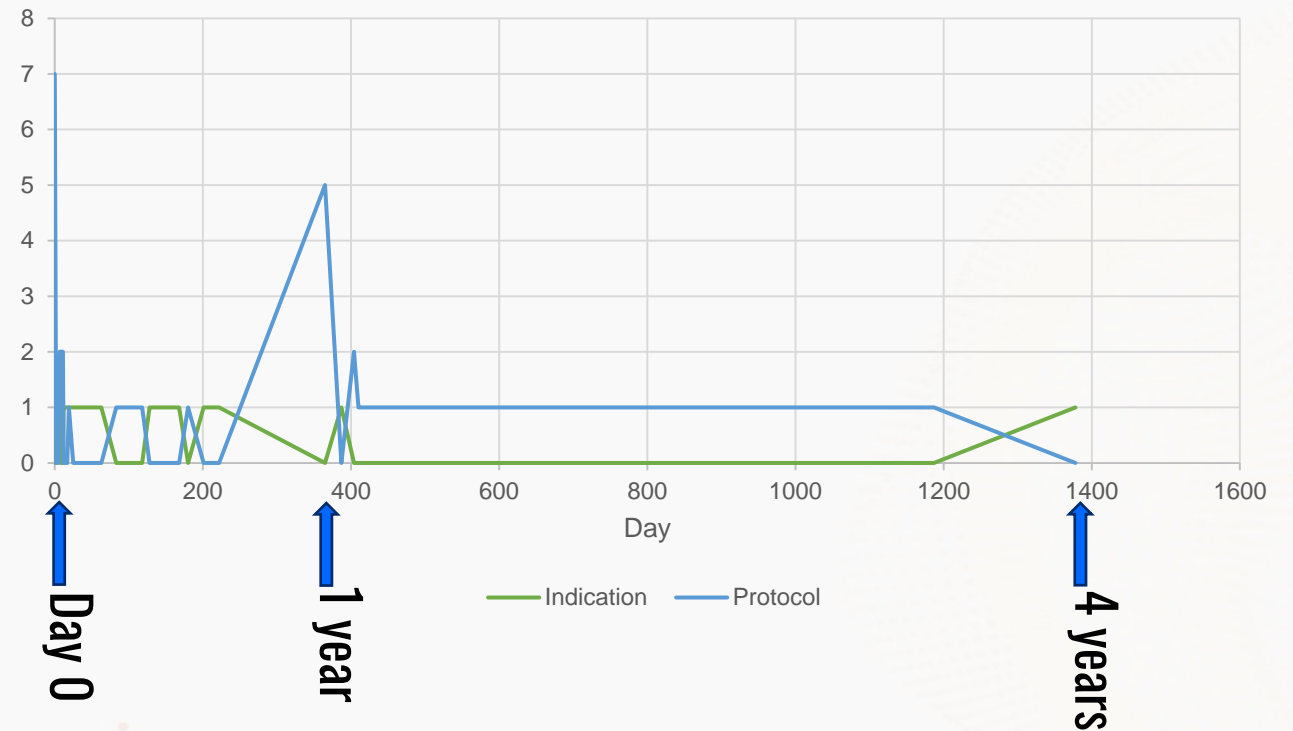


Timeline of major potential diseases in the transplanted kidney begins with donor disease and progresses through rejection (above) and nonrejection categories (below). (Courtesy J. Chapman, MD.)

Demographics and Biopsy statistics

DEMOGRAPHICS		
17 total patients	Combined Heart & Kidney	9
	Kidney Bg Heart tx	3
	Kidney Bg Lung tx	5
Total number of kidney biopsies		61
Average number of kidney biopsies/ patient		3.75
Avg Indication biopsies/patient		1.8
Avg Protocol biopsies /patient		2.06

Number of Protocol vs Indication biopsies by Day



Biopsy Adequacy

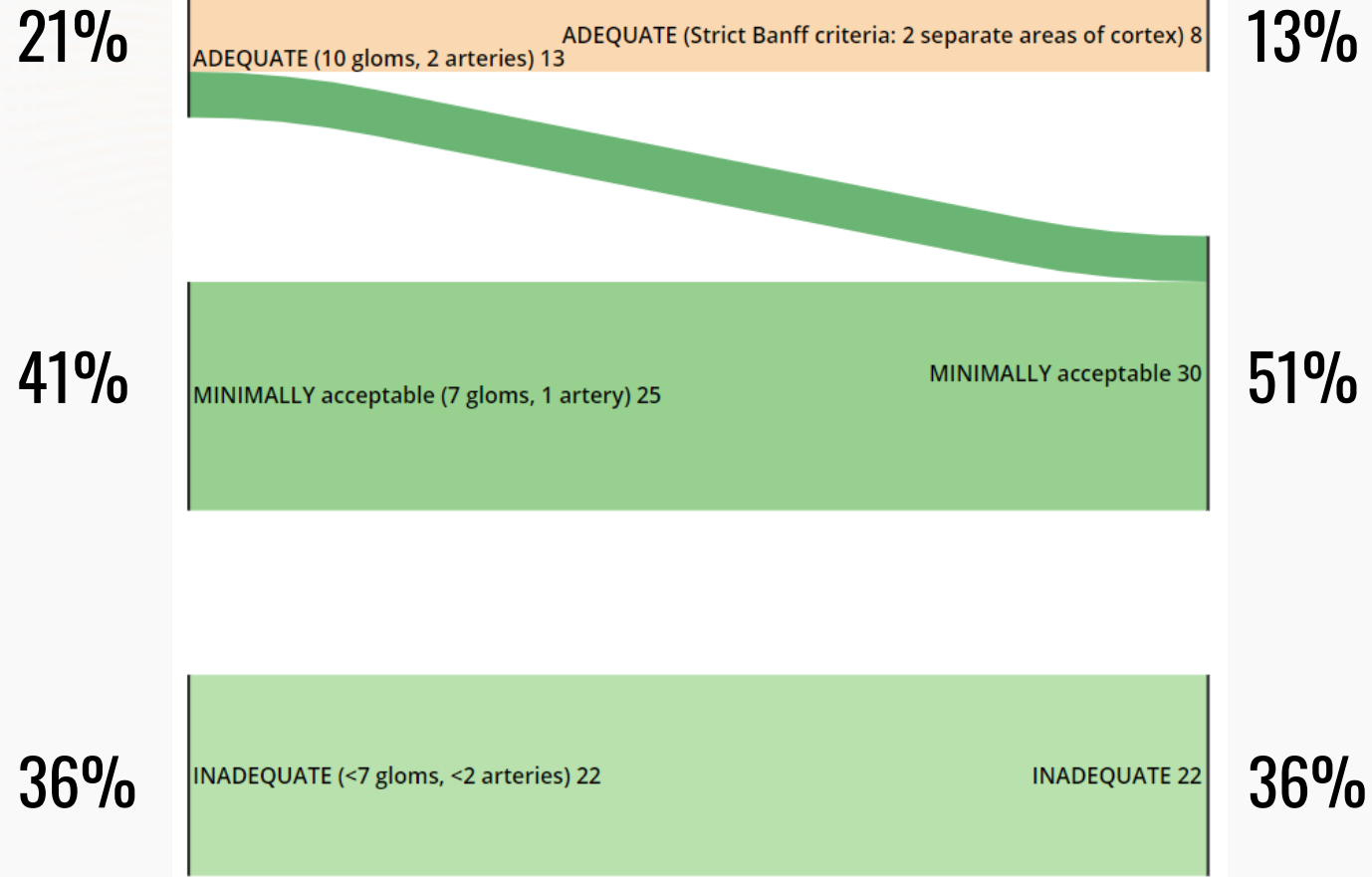
Adequacy of Specimen

Since Banff 1997 a biopsy has been considered adequate if it contains at least 10 or more glomeruli and at least 2 arteries; the threshold for a “minimal sample” is 7 glomeruli and 1 artery.⁵ It is also recommended that at least 2 separate cores containing cortex be obtained or that there be 2 separate areas of cortex in the same core.¹¹ In the recent consensus manuscript on polyomavirus nephropathy for the determination of Banff Score pvl adequacy requires medulla in the biopsy in addition to the two cores.²²

Artery

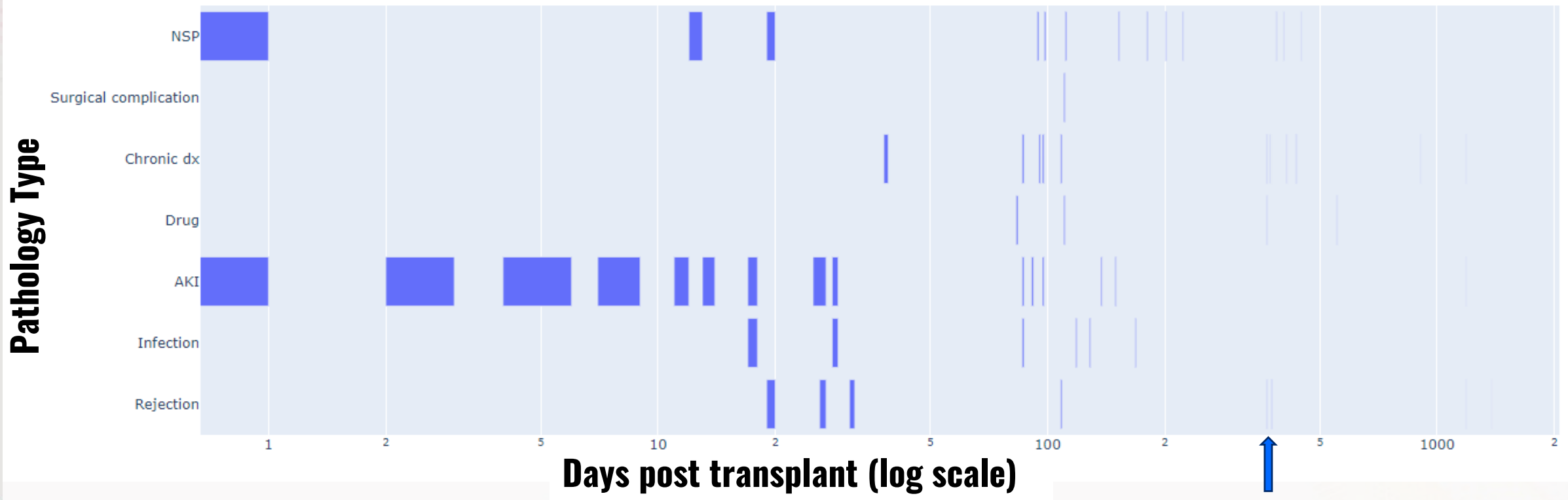
Since Banff 2013⁴ an artery has been defined by “having a continuous media with two or more smooth muscle layers”.¹¹

Biopsy Adequacy: 61 biopsies

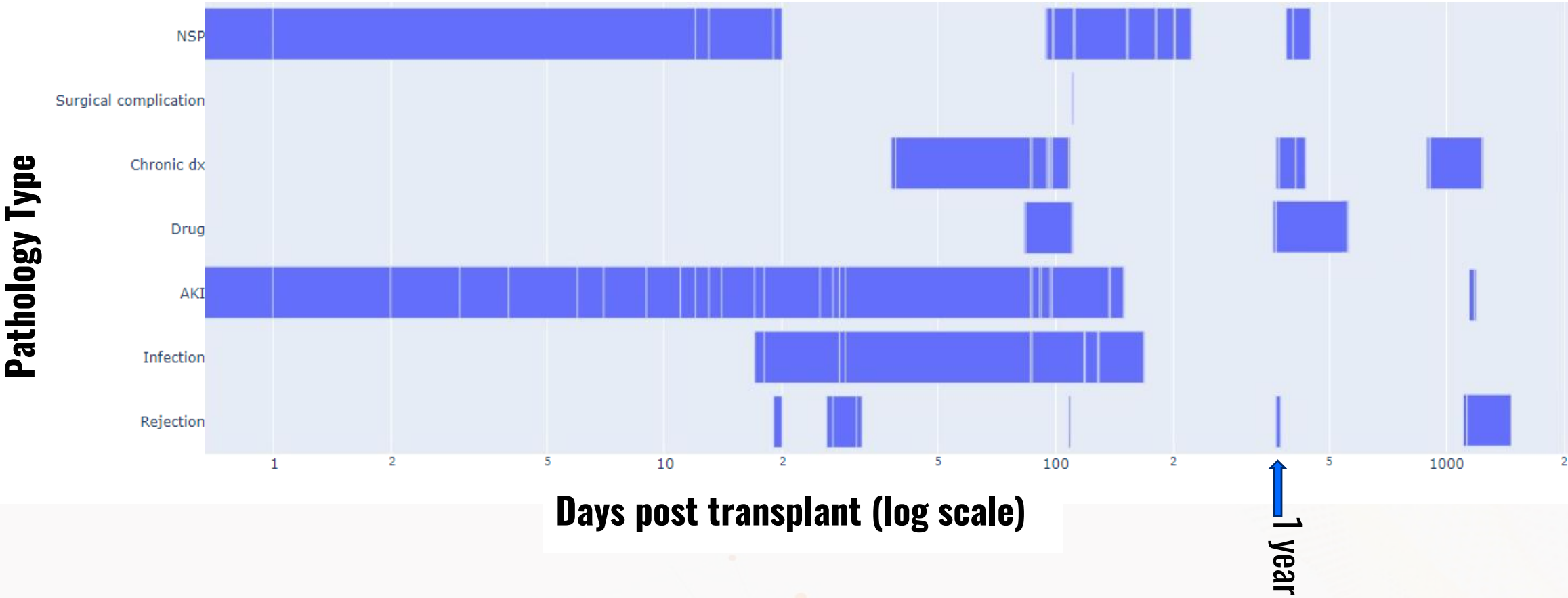


Pathology Findings

PATHOLOGY ON BIOPSY							
Rejection	Infection	AKI	Drug	Donor disease recurrence	Chronic dx	Surgical complication	NSP
8	6	23	5	0	12	1	16



Pathology categories by Day post transplant



Pathology Findings: Rejection

REJECTION	
Borderline TCMR	4*
TCMR	1
Acute ABMR	1
Chronic ABMR	2*
Borderline ABMR	1
* one case with both	

Points:

Borderline TCMR- All four cases didn't have a follow up biopsy

Banff 2017- 2022 contentious i score

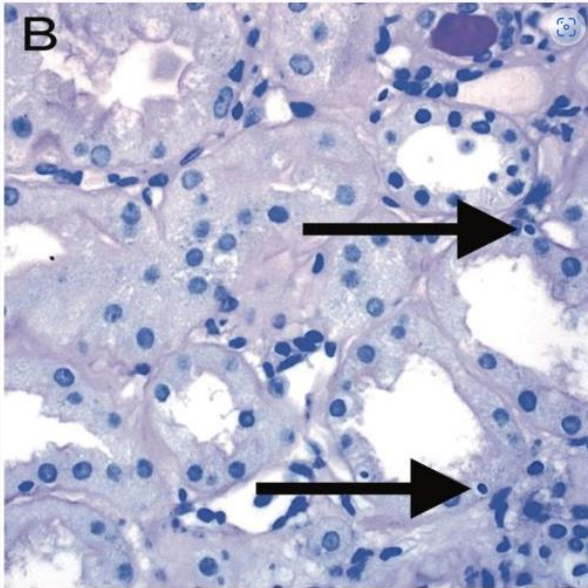
Current Banff Category 3: Suspicious (Borderline) For Acute TCMR Foci of Banff Lesion Score $t > 0$ AND Banff Lesions Score $i = 1$ OR Foci of Banff Lesion Score t_1 AND Banff Lesion Score $i \geq 2$

Borderline ABMR: No such Banff category

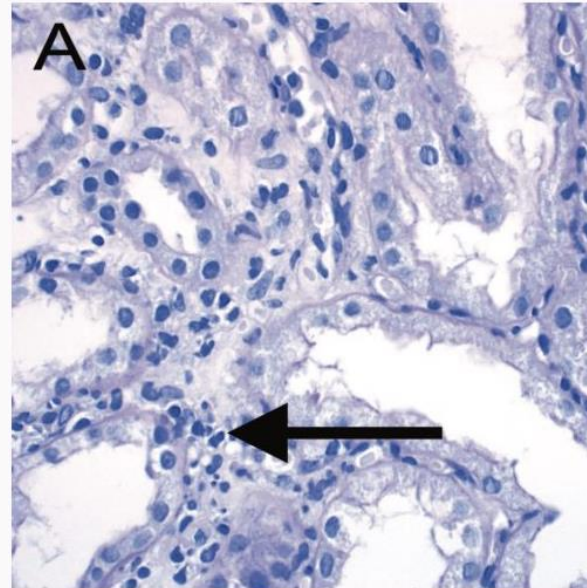
Category 3: Suspicious (Borderline) For Acute TCMR Foci of Banff Lesion Score $t > 0$ AND Banff Lesions Score $i = 1$ OR Foci of Banff Lesion Score t_1 AND Banff Lesion Score $i \geq 2$

Borderline TCMR

t1 Tubulitis (1-4 monocytes/tubule)



i1 Interstitial inflammation (10-25%)



**Current Banff Category 3:
Suspicious (Borderline) For Acute
TCMR**

Foci of Banff Lesion Score $t > 0 + i = 1$
OR

Foci of Banff Lesion Score $t1 + i \geq 2$

[In 2005- $t1i0$

In 2019- $t \geq 1 + i \geq 1$]

commentary

**The meaning of borderline
rejection in kidney
transplantation**

Brian J. Nankivell¹

Kidney International (2020) **98**, 278–280; <https://doi.org/10.1016/j.kint.2020.04.052>



Borderline ABMR

ATI and C4d3

“C4d staining with ATI” included in a subgroup within ABMR:

- ATI
- C4d \geq 2 (IF) or \geq 0(IHC)
- No MVI

Probable ABMR

If DSA present and early transplant

ABO incompatibility

Accommodation

No ABMR

DSA negative in conventional transplants

> [Am J Transplant. 2024 Mar;24\(3\):350-361. doi: 10.1016/j.ajt.2023.10.031. Epub 2023 Nov 4.](#)

The Banff 2022 Kidney Meeting Work Plan: Data-driven refinement of the Banff Classification for renal allografts

Candice Roufosse¹, Maarten Naesens², Mark Haas³, Carmen Lefaucheur⁴, Roslyn B Mannon⁵, Marjan Afrouzian⁶, Nada Alachkar⁷, Olivier Aubert⁸, Serena M Bagnasco⁹, Ibrahim Batal¹⁰, Chris O C Bellamy¹¹, Veronique Brochez¹², Klemens Budd¹³, Marjan Glebova Van Gansbeke¹⁴

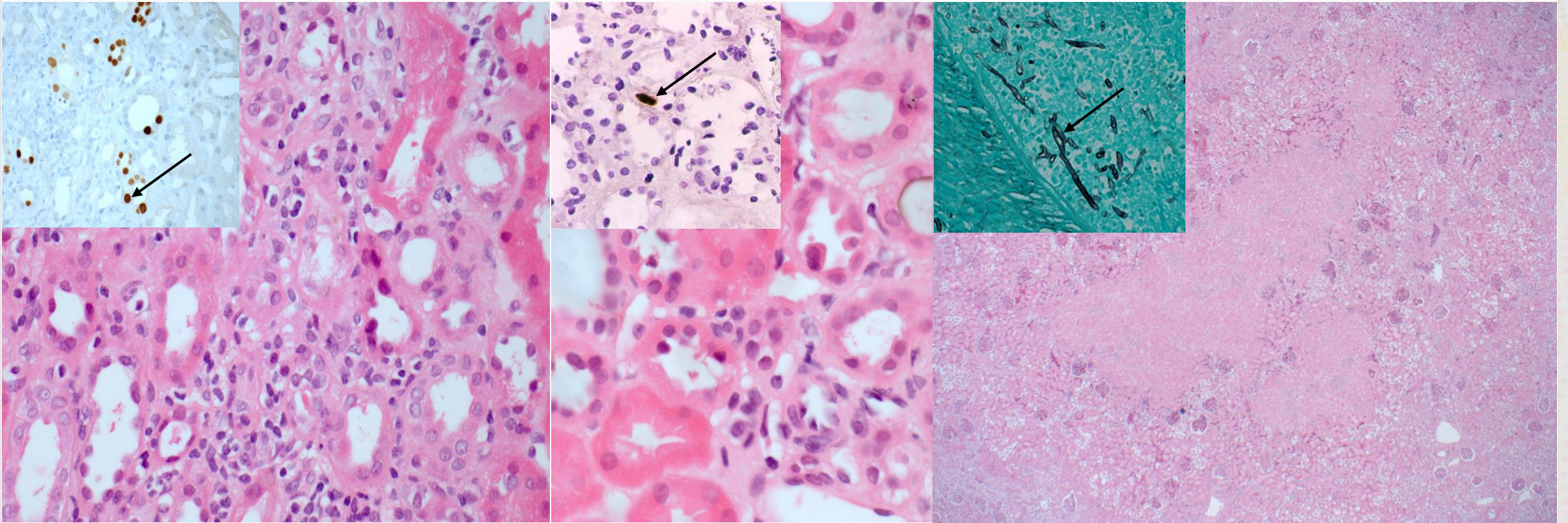
Pathology Findings: Infection

INFECTION		
Disseminated fungal infection	1	
BKV	3	
CMV	1	
Unknown	1	

Points

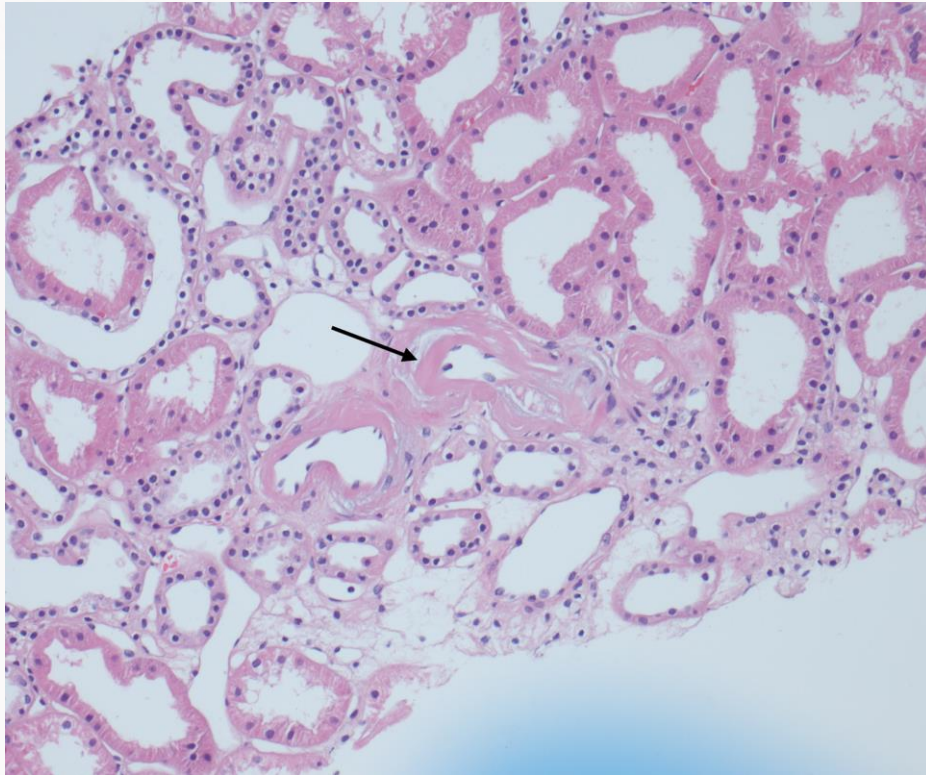
- Disseminated fungal infection- Aspergillus fumigatus on autopsy culture and bronchoscopy prior.
- PyVAN, preceded by urine and serology
- CMV – uncertain
- Acute pyelonephritis- Urine MSC with E.coli and Candida

PyVAN, CMV, Aspergillous

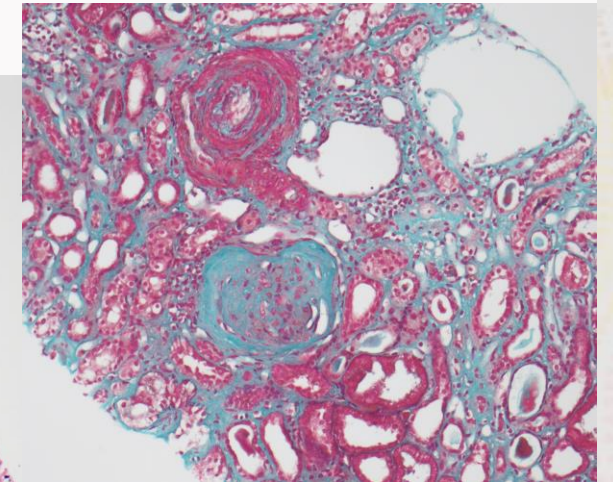
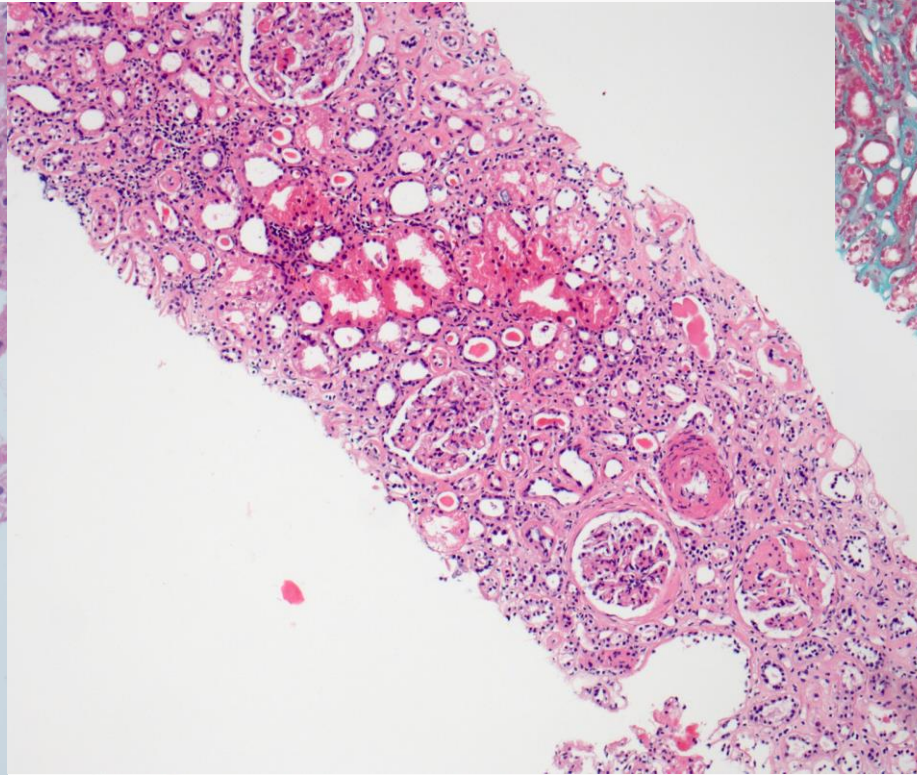


Pathology Findings: Chronic change

CNI Toxicity – Vascular change



IFTA- End stage kidney



Pathology findings: Malignancy

Cutaneous SCC/BCC

Specimen:

1. R temple
2. L temple
3. L post shoulder
4. R post neck superior
5. R post neck inferior
6. Upper mid back superior
7. Upper mid back inferior

Clinical Information:

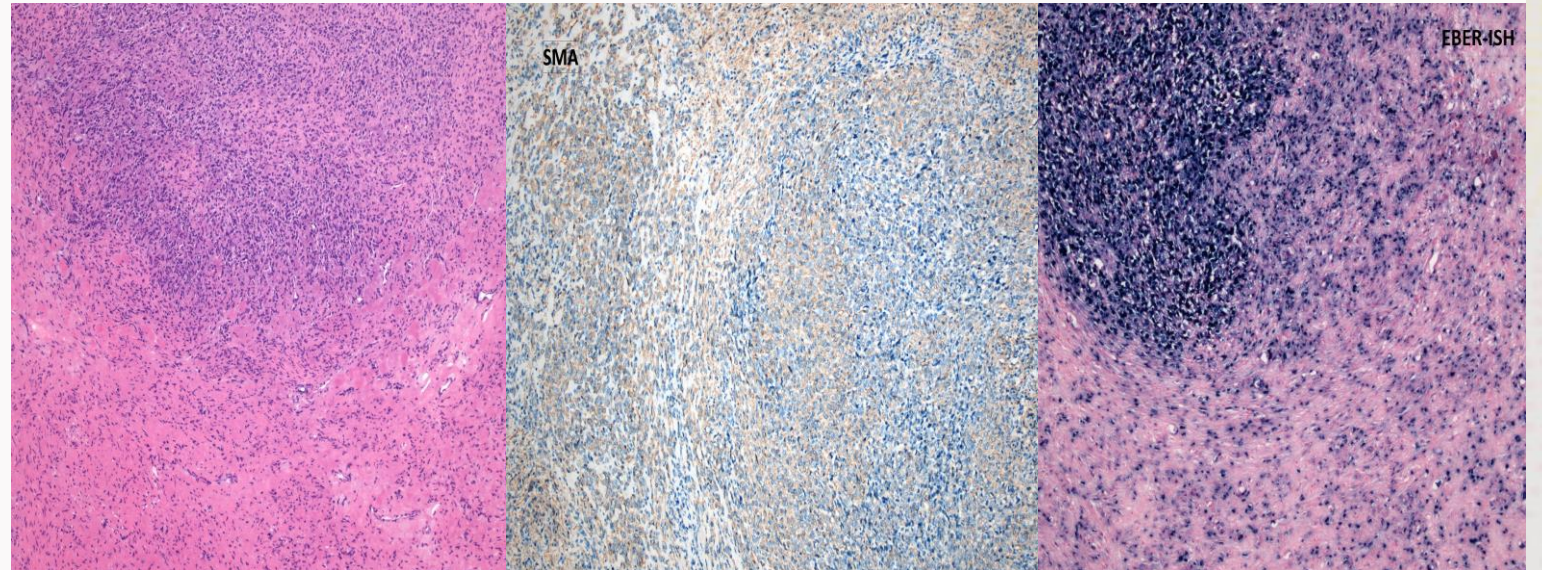
1. ?BCC
2. ?BCC
3. ?BCC
4. ?BCC
5. ?BCC
6. BCC
7. Excision ?pig BCC

DIAGNOSTIC SUMMARY:

1. R temple: **BASAL CELL CARCINOMA.**
2. L temple: **ACTINIC KERATOSIS.**
3. L post shoulder: **BASAL CELL CARCINOMA.**
4. R post neck: **BOWEN DISEASE (SQUAMOUS CELL CARCINOMA IN SITU).**
5. R post neck inferior: **BOWEN DISEASE (SQUAMOUS CELL CARCINOMA IN SITU).**
6. Upper mid back superior: **BASAL CELL CARCINOMA.**
7. Punch excision, upper mid back inferior: **BASAL CELL CARCINOMA, margins clear.**

1. Lesion root of penis
2. Lesion right scrotum
3. Right ear lobule
4. Root of helix lesion
5. Right upper back cyst
6. Right upper ear posterior
7. Right ear canal suture deepest
8. Right parietal scalp
9. Right conchal fossa suture superior
10. Triangular fossa right pinna
11. Right pinna
12. Right parietal scalp suture superior
13. Right temporal parietal lesion
14. Parietal occipital lesion inferior
15. Anterior temporal/parietal
16. Shave upper forehead right
17. Parietal occipital lesion. Superior.

EBV SMT



Thank you

ANZDATA registry– Dr Chris Davies

Renal physicians – Dr's Jacob Sevastos, James Tang and Namrata Khanal

Renal registrar - Dr Peter Lee

Renal transplant coordinator - Gillian Aitken

Heart transplant coordinator - Dexter Cornelius

Renal pathology colleagues (past and present) – Dr's Steve Rainer, Jenny Turner, Nirmala Kumaradevan, Vanathi Sivasubramaniam, Tao Yang, Svetlana Cherapanoff

Renal pathology club -> Julia.low@svha.org.au

Thank you

