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Case Report

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IgA Vasculitis Secondary to *Enterococcus Faecalis* Cardiac Device Infective Endocarditis; A Case Report, Discussion of the Literature and Protocol for Assessment of Inflammatory Skin Lesions in Emergency Medicine

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Abstract

A 68-year-old Caucasian male presented to the emergency department for administration of IV ceftriaxone post discharge for Enterococcus faecalis Cardiac Device Infective Endocarditis (CDIE). The patient reported a rash on his legs which had been present for many weeks. On examination the rash a revealed non-blanching purpuric rash resembling leukocytoclastic vasculitis. Biopsy and serology performed in our rural emergency department confirmed IgA vasculitis (IgAV). The patient had no systemic features to suggest IgA nephritis, or other systemic disease and the rash resolved with no additional treatment. A discussion of the differential diagnoses in this case highlights the importance of opportunistic biopsy and vasculitis serology in the rural emergency department setting and recommends screening for underlying cancer given the close association of IgAV with malignancy. The importance of emergency department protocols for assessment of skin lesions suggestive of an underlying systemic disease is also discussed.

Keywords: IgA vasculitis, Biopsy, Leukocytoclastic vasculitis, Enterococcus faecalis Cardiac Device Infective Endocarditis

Introduction

IgA vasculitis (IgAV) (formerly known as Henoch-Schönlein Purpura) is an uncommon condition that has traditionally been associated with infection in paediatric populations [1,2]. It is a rare condition in the adult population with varied incidence rates depending on geographic region [2]. In Western Australia incidence is reported at around 1–2 per 100,000 /year [1] whilst some studies provide a global incidence rate of 0.8-5.1 per 100,000, noting more common occurrence in the fifth and sixth decades of life, as well as a male-to-female ratio of 1.5 [3].

True incidence of adult IgAV is likely to be higher than reported values due to missed diagnoses. IgAV most commonly occurs in autumn and winter [2] which might reflect its predominantly infective aetiology [2], however it is also recognised to occur in relation to adverse drug reactions (Yousif) and as part of underlying systemic diseases including malignancy and systemic rheumatic disease. Between 2.5% to 12.8% of adults who present with IgA vasculitis have an underlying malignancy [4]. IgA vasculitis occurs in association with systemic rheumatic diseases such as Rheumatoid Arthritis [5] primary Sjogren Syndrome [6] Systemic Lupus Erythematosis [7] and others.

Cardiac device-related infective endocarditis (CDRIE) is a well-documented clinical phenomenon [8]. IgA vasculitis associated with IE is also well recognised in the literature [9-11]. However, CDRIE associated IgA is not documented in the literature to the best of the authors' knowledge.

This case describes a rare case of CDRIE-associated IgAV, discusses differential diagnoses for non-blanching purpuric rashes in this setting and suggests an approach to assessment of vasculitic rash in the context of the emergency department.

Case Description

A 68-year-old Caucasian male presented to the authors' rural emergency department for 6 weeks of IV antibiotic therapy post *E. faecalis*-CDRIE following discharge from a metropolitan university teaching hospital.

In October of 2022, the patient was admitted to the major tertiary hospital with septic shock where a transthoracic echocardiogram

identified tricuspid valve IE with the leads of the patient's Dual Chamber Implantable Cardiac Defibrillator (ICD) determined to be the source of *E feacalis.* He was treated with intravenous amoxicillin and benzylpenicillin.

6 months prior to that admission the patient had been hospitalised with *E faecalis* bacteraemia and treated with IV benzylpenicillin, however the focus of infection was not discovered during that admission.

During the admission for CDRIE a rash on the patient's lower limbs was noted and a partial vasculitic screen was undertaken, however rheumatology consult was not sought at the time.

The patient was discharged with instructions to present to our rural Emergency Department for daily intravenous ceftriaxone. The patient was initially seen by one of the emergency department's nurse practitioners who noted the rash and sought an opinion from the primary author.

Medications at Presentation to the Rural ED

Ceftriaxone 2g IV 12 hourly for 6 weeks initiated on 10/10/2022
Perindopril 1.25mg nocte
Empagliflozin 10mg nocte
Bisoprolol 2.5mg mane

The patient had no known drug allergies.

Past Medical History

Ischaemic Heart Disease
Polymyalgia Rheumatica
Hypertension
Type 2 Diabetes
Hypercholesterolaemia
Dilated Cardiomyopathy
Chronic Obstructive Airway Disease
Heart Failure with Reduced Ejection Fraction 30-40%
Aortic sclerosis
Hernia mesh repair
Colon adenocarcinoma anterior resection 2005

On Examination

The patient appeared comfortable and well for his age with a normal body habitus weighing approximately 85kg.

The patient was afebrile at the time of presentation with vital signs within normal parameters and was systemically well.

Abnormal examination findings included a non-blanching palpable purpuric rash on the patient's lower limbs extending across the anterior and posterior lower limbs with involvement of the gluteal region. The rash is depicted in Figure 1 and Figure 2.

This appeared to be in keeping with a leukocytoclastic vasculitic rash with an IgA vasculitis distribution (formerly known as Henoch-Schönlein Purpura (HSP)).

The patient reported the rash had been present for 10 weeks.

Two 8mm punch biopsies were taken from the patient's right anterior shin and sent for histology and immunofluorescence.

Figure 1: Non blanching bilateral purpuric rash affecting the patient's anterior and posterior lower legs (photographs reproduced with patient permission).

Serology for a vasculitis screen was repeated, noting a partial screen already undertaken by the infectious diseases team at the tertiary hospital

Figure 2: Biopsy site of the right anterior shin.

The patient did not have any signs of systemic illness at the time of presenting to the ED hence, no further investigations were performed during his course of IV antibiotics.

Results

Complete Blood Count and C Reactive Protein			
Marker	Level	Units	Ref range
Haemoglobin	101	g/L	135-175
White cell count	3.72	x10*9/L	4.0-11.0
Platelet count	184	x10*9/L	150-450
Red Blood Cells	3.4	x10*12/L	4.50 -6.00
Packed cell count	0.31	L/L	0.40-0.50
MCH	30	pg	27-33
MCV	90.6	fL	80-98
CRP	97.1	mg/L	0.0-8.0
Vasculitis Screen			
ANA	Negative		
ENA	Negative		
Lupus anticoagulant	Negative		

Anticardiolipin antibody	Negative		
Beta-2-glycoprotein	Negative		
HBV	Not detected		
HCV	Not detected		
Ds-DNA	Not detected		
Myeloperoxidase antibody	1	IU/mL	<=5
Proteinase 3 antibody	12	IU/mL	<=5
Neutrophil Cytoplasmic Ab screen	Positive		
Neutrophil Cytoplasmic Ab intensity	Weak		
Neutrophil Cytoplasmic Ab pattern	Classical Peri		
Complement C3	0.78	g/L	(0.90-1.8)
Complement C4	0.08	g/L	(0.10-0.4)
Cryoglobulin screen	Negative		
Cryofibrinogen screen	Negative		
Cryoglobulin comment	NAD		
Urea and Electrolytes, Liver function Tests			
Sodium	127	mmol/L	135-145
Potassium	4.7	mmol/L	3.5-5.2
Chloride	99	mmol/L	95-110
Bi carb	18	mmol/L	22-32
Anion gap	15	mmol/L	7-17
Glucose	5.4	mmol/L	3.2-5.5
Urea	7.5	mmol/L	2.7-8.0
Creatinine	138	umol/L	60-110
eGFR	43	mL/min/1.73m2	>=60
Calcium level	1.97	mmol/L	2.10-2.60
Phosphate	0.64	mmol/L	0.75-1.50
Magnesium	0.69	mmol/L	0.7-1.10
Albumin	21	g/L	34-48
Globulin	55	g/L	21-41
Total protein level	76	g/L	60-80
Bilirubin	22	umol/L	2-24
GGT	44	U/L	0-60
ALP	68	U/L	30-110
ALT	8	U/L	0-55
AST	28	U/L	0-45
LDH	282	U/L	120-250
CK	11	U/L	0-250

Table 1: Serology results in early October 2022 at initial development of rash post IE.

Complete Blood Count and C Reactive Protein			
Marker	Level	Units	Ref range
Haemoglobin	120	g/L	135-175
White cell count	6.65	x10*9/L	4.0-11.0
Platelet count	193	x10*9/L	150-450
Red Blood Cells	4.25	x10*12/L	4.50 -6.00
Packed cell count	0.38	L/L	0.40-0.50
MCH	28	pg	27-33
MCV	90.4	fL	80-98
CRP	97.1	mg/L	0.0-8.0
Vasculitis Screen			
ANA	Negative		
ENA	Negative		
Lupus anticoagulant	Negative		
Anticardiolipin antibody	Negative		
Beta-2-glycoprotein	Negative		
Ds-DNA	Not detected		
Myeloperoxidase antibody	1	IU/mL	<=5
Proteinase 3 antibody	12	IU/mL	<=5
Neutrophil Cytoplasmic Ab screen	Negative		
Neutrophil Cytoplasmic Ab intensity	Negative		
Neutrophil Cytoplasmic Ab pattern	Negative		
Complement C3	1.47	g/L	(0.90-1.8)
Complement C4	0.16	g/L	(0.10-0.4)
Cryoglobulin screen	Negative		
Cryofibrinogen screen	Negative		
Cryoglobulin comment	NAD		
Urea and Electrolytes, Liver Function Studies			
Sodium	131	mmol/L	135-145
Potassium	4.8	mmol/L	3.5-5.2
Chloride	103	mmol/L	95-110
Bi carb	24	mmol/L	22-32
Anion gap	14	mmol/L	7-17
Glucose	5.2	mmol/L	3.2-5.5
Urea	7.5	mmol/L	2.7-8.0
Creatinine	91	umol/L	60-110
eGFR	71	mL/min/1.73m2	>=60
Calcium level	2.19	mmol/L	2.10-2.60

Phosphate	1.26	mmol/L	0.75-1.50
Magnesium	0.88	mmol/L	0.7-1.10
Albumin	22	g/L	34-48
Globulin	50	g/L	21-41
Total protein level	72	g/L	60-80
Bilirubin	7	umol/L	2-24
GGT	21	U/L	0-60
ALP	55	U/L	30-110
ALT	9	U/L	0-55
AST	Haemolysed	U/L	0-45
LDH	Haemolysed	U/L	120-250
CK	11	U/L	0-250

Table 2: Serology Results in late October 2022 post 3 weeks of IV antibiotics.

Biopsy Results

Histology and Immunofluorescence revealed a leukocytoclastic vasculitis characterised by dermal haemorrhage, perivascular neutrophilic inflammation with cytoplastic debris and fibrinoid alteration of vessel walls. Eosinophilic infiltrate was noted.

By direct immunofluorescence there was labelling of the small post capillary venules situated in the dermal papillae by C3 (Strong), C1q (Weak Granular) and IgA (weak granular) with no convincing labelling by other immune reactants (Fibrinogen, IgM, IgG). Images are depicted as follows:

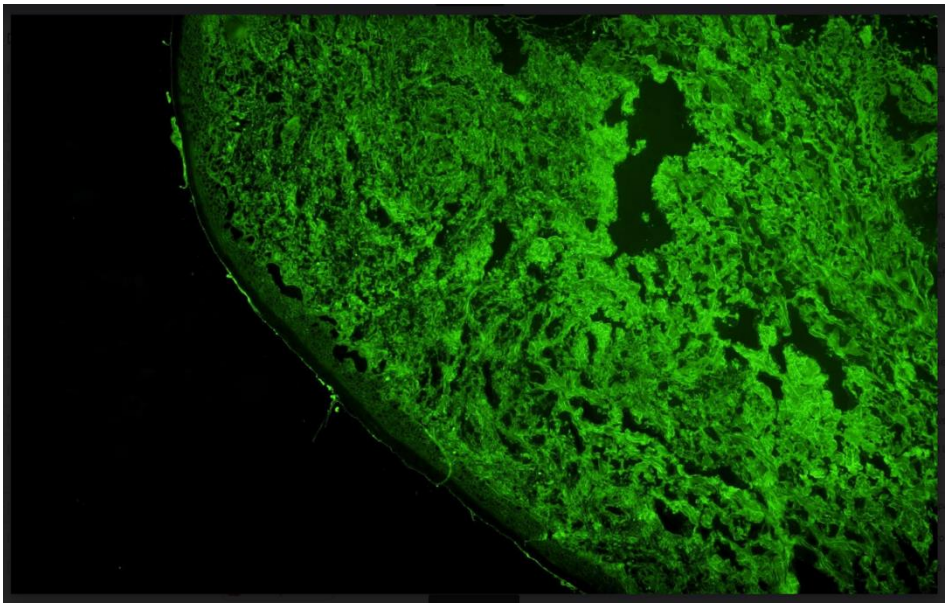
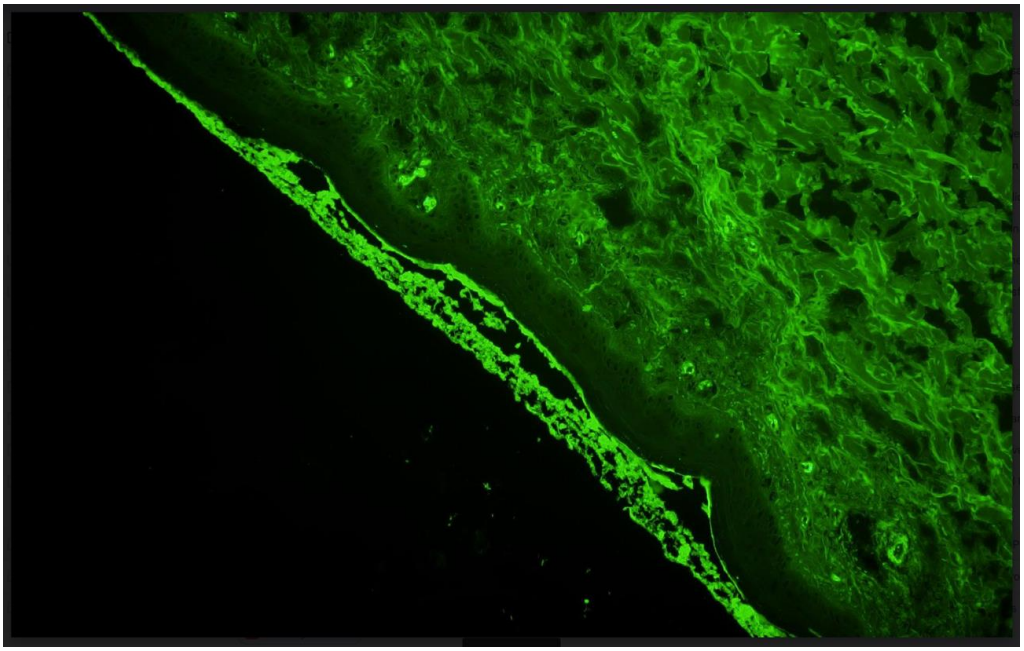


Figure 3: IgA deposition demonstrated on immunofluorescence of skin biopsy.



These findings are most likely representative of an IgA dominant infection-related vasculitis.

Figure 4: C3 deposition demonstrated on immunofluorescence of skin biopsy.

Discussion

Leukocytoclastic vasculitis is one of many vasculitides as defined by the 2012 Revised International Chapel Hill Consensus Conference Nomenclature of Vasculitides (Jenette, et al, 2013). There is a recognised association with infective aetiology [12]. Leukocytoclastic vasculitis in IE can present with IgA deposition on histological examination as well as without IgA deposition. Both types of leukocytoclastic vasculitis are reported in the literature.

When leukocytoclastic vasculitis is associated with IgA and other systemic features it is regarded as IgA Vasculitis (IgAV), previously referred to as Henoch Schonlein Purpura (HSP). HSP is commonly described this way in literature despite the "new" Chapel Hill Nomenclature (Jenette, et al, 2013). IgAV is preceded by infections in 95% of cases [12] (Abdgawad, 2012), However, IgA vasculitis in the context of infection presents in adults in only 10% of cases [11]. There is growing recognition of a genetic association [13].

A range of organisms has been reported in association with IgA vasculitis including, but not limited to:

- *Enterococcus faecalis [14],*
- *Streptococcus gallolyticus [15],*
- *Streptococcus viridans (in over 50% of reported cases) [16],*
- *Streptococcus sanguis [17],*
- *Staphylococcus epidermidis [18],*
- *Methicillin Sensitive Staphylococcus Aureus [19, 20],*
- *Candida parapsilosis [21],*
- *Cardiobacterium hominis [21].*

There are several reports of IgA vasculitis associated with IE in literature, however it is relatively rare and usually involves renal failure and is sometimes fatal [10,14,18,19,22,23].

It is essential to distinguish between infective autoimmune triggers of IgAV and non-infective autoimmune IgAV, as a missed diagnosis could have disastrous patient outcomes [14].

Thongprayoon et al., [24] mention an important point regarding IE-associated IgAV, warning that a negative skin biopsy does not rule out the diagnosis and a renal biopsy is key to making the diagnosis.

The mechanism by which infective organisms trigger IgA vasculitis is thought to be largely due to aberrant IgA response. Activation of the complement cascade via infection leads to circulating immune complexes and micro-emboli on vascular endothelium, activation of neutrophils resulting in characteristic vascular findings on biopsy of peri vascular inflammation, cytoclastic debris, fibrinoid necrosis and often extravasated red blood vessels [11, 14, 25] (Sugino, et al, 2021).

The pathogenesis in IE can be conceptualised broadly in Figure 5.

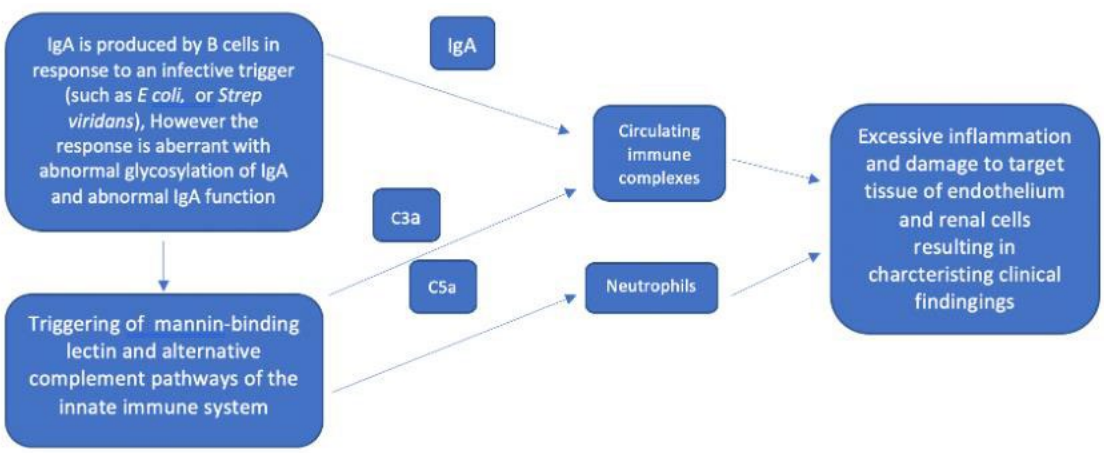


Figure 5: Broad Overview of the role of Complement Activation and IgA in Infective Endocarditis Resulting in IgAV.

Patients with subacute IE have been noted to have significantly increased levels of agglutinating and complement fixing bactericidal antibodies and many extra-cardiac manifestations of the disease result from circulating immune complexes [26].

ANCA positivity in association with IE is well recognised and found in up to 30% of cases [26]. This can lead to a misdiagnosis of an ANCA-associated vasculitis.

This patient demonstrated a weakly positive Neutrophil Cytoplasmic Ab screen with a classical pericytoplasmic pattern and a positive Proteinase 3 antibody at 12 umol/L.

Leukocytoclastic vasculitis in IE can be caused by mixed cryoglobulinemia [27-29].

Based on case reports IE-associated leukocytoclastic vasculitis [12], the authors propose this can be considered as different entities as depicted in Figure 5. These conditions represent differential diagnoses for a patient with IE who presents with palpable purpura of the lower limbs.

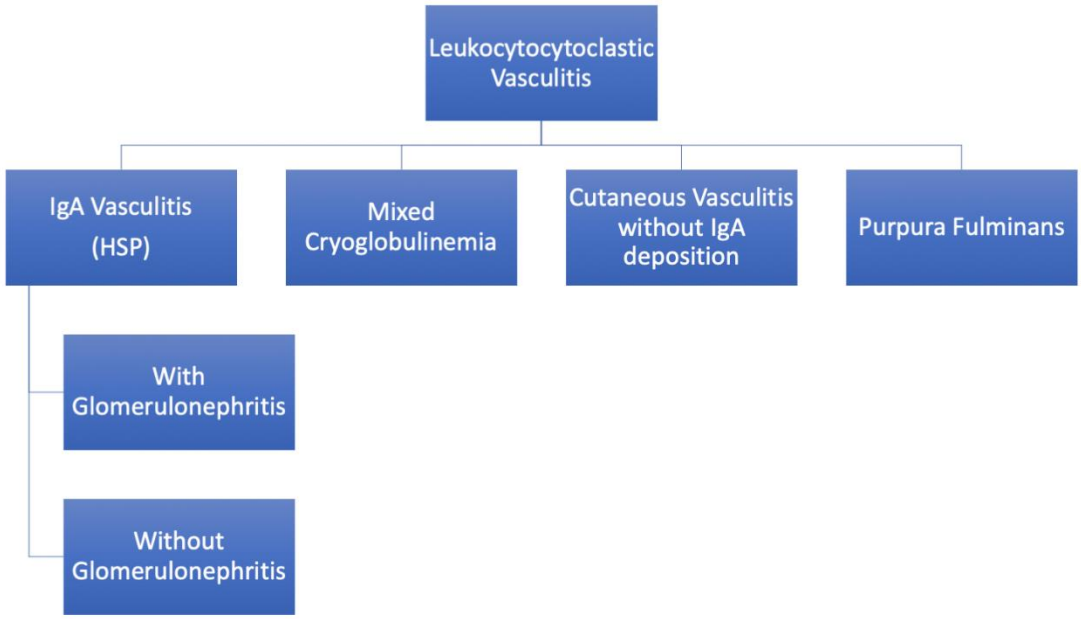


Figure 6: Classification of IE-Associated Vasculitides.

There is debate in the literature about whether IgA glomerulonephritis represents a separate entity to IgAV, or whether this is a continuum of the same spectrum of disease [30]. Given these disorders have identical findings on biopsy [31], the authors are of the opinion both conditions represent a spectrum of IgAV.

Certain literature distinguishes IgA vasculitis in IE from the separate entity of IE-associated purpura and glomerulonephritis [32], however this is a matter for debate due to the rareness of conditions and overlapping, clinical, histological and serological features. This forms part of the larger debate of whether IgAV is a

separate entity to IgA glomerulonephritis.

One literature review by Ai et al. [32] discussed IE patients presenting with purpura and glomerulonephritis distinguishing these patients from those with IE and IgA vasculitis, stating patients with purpura and glomerulonephritis on renal biopsy were found to have predominantly C3 dominant deposition, however 40% of these cases also have IgA deposition. This highlights the complexity of vasculitic lesions in IE and the diagnostic dilemmas presented, raising the question of whether they are truly separate entities, or a spectrum of the same condition.

Differential Diagnoses

The main differential diagnoses for this case are:

- Purpura Fulminans
- Thrombocytopaenic purpura
- Systemic Lupus Erythematosus (SLE)
- Mixed cryoglobulinemic vasculitis
- Urticarial vasculitis
- Ecythema Gangrenosum

E Faecalis is reported to be capable of producing purpura fulminans (PF) also known as purpura gangrenosa [33-35]. PF can present with a leukocytoclastic vasculitis and C3 deposition mimicking IgAV [36]. PF usually progresses rapidly and can lead to disseminated intravascular coagulopathy (DIC) with a high mortality rate [37]. It is sometimes associated with inherited bleeding diastheses such as protein C, protein s or antithrombin III deficiency [38]. The purpuric lesions usually develop rapidly to skin necrosis. PF is not usually associated with IgA deposition making it an unlikely diagnosis in this case, although there is a case report by Tassavor, Tassavor and Awadhi [39] describing a case of Linear IgA bullous disease (LABD) developing to purpura fulminans as the result of an adverse drug reaction.

There are paediatric case reports of IgA vasculitis developing into haemorrhagic bullous lesions (Ramelli et al., 2017) which closely resemble PF, but there is no literature to suggest that IgAV is cable of developing into PF and these 2 conditions represent distinct pathological entities, however, are difficult to distinguish without skin biopsy. Given that PF does not present with IgA deposition and usually follows a rapid course it is an unlikely diagnosis in this case.

Thrombocytopaenic purpura (TP) can resemble leukocytoclastic vasculitis, however the patient's platelets remained within normal range throughout the course of the disease process, ruling out TP.

Occasionally, ecythema gangrenosum (EG), a necrotising vasculitis, can mimic leukocytoclastic vasculitis. It is most commonly associated with Pseudomonas aeruginosa bacteremia and has been reported in association with the presence of other comorbid infections in immunocompromised hosts [40]. It has been reported in cases of Staphlococcus aureus [40,41] and methicillin-resistant Staphylococcus epidermidis [42]. There are case reports of EG ocurring in association with *Enterococcus fecalis* [43,44]. However, in this case the biopsy findings do not support this diagnosis, making it unlikely.

The patient denied experiencing any of the symptoms commonly associated with IgAV including the following:

- Adominal pain and vomiting (present in 35-85% of cases) [45]
- Oligo symmetrical arthritis (present in 60-84% of cases) [45]
- Lower limb pitting oedema (present in 20-50%) [45]
- Scrotal oedema (present in 2-35%) [45]
- Gastrointestinal bleeding (present in 30% of cases) (Sugino et al, 2021)

Immunofluorescent weak C1q vascular deposition is commonly associated with complement activation and low compliment states, particularly systemic lupus erythematosus (SLE), or hypocomplementemic urticarial vasculitis [46]. Clq vascular deposition is not commonly reported in IgAV. However, the negative ANA, Ds-DNA and ENA, SLE is ruled out.

Hypocomplementemic urticarial vasculitis is uncommonly associated with IgA deposition [47], however it is less a much less likely diagnosis since the temporality of the palpable purpura relate to the IE in this case.

The patient did develop low complement of C3 0.78g/L and C4 0.08 g/Lrespectively. Chan et al. [25] describe a case of hypocomplementemic atypical IgA vasculitis mentioning that 15% of patients with IgAV develop hypocomplementemia. Figure 6 most likely explains how the complement cascade and IgA are the predominant pathways in the pathophysiology of this entity.

The patient was noted to have a normocytic anaemia with a haemoglobin of 101 g/L and MCV of 98 fL. The patient's serology was negative for coagulopathy and thrombocytopenia [48].

The patient's renal function improved over the 6 weeks he received IV antibiotics in our rural emergency department.

Renal involvement occurs within 3 months of development of purpura in 55% of cases [25]. Close monitoring of renal function is warranted in these patients. Rarely, IgAV is fatal [49] due to GI haemorrhage, or infection secondary to aggressive immunotherapy treatment of severe cases [5]. In a patient whose IgAV is triggered by a chronic infection renal involvement becomes a significant challenge when immunosuppression is required.

This type of complex case presents several challenges for rural emergency departments where rheumatology services are lacking. Biopsies are not routinely performed in emergency department workups, However rural Australia is currently experiencing a crisis of General Practitioner shortages in Primary Care with long waiting times. Referral to rheumatology services at the nearest tertiary centre is a 5-hour journey by road with potentially long waiting times. In patients who present with lesions suspicious of vasculitis it therefore becomes the Emergency Department's responsibility

to initiate investigations that would normally be performed in an outpatient setting. Is it possibly unreasonable to expect a patient to wait for outpatient follow up in these circumstances and potentially dangerous in cases of suspected vasculitides.

There are no formal protocols for investigation of inflammatory skin lesions in emergency department contexts as far as the authors are aware and there is limited literature in general on inflammatory dermatology lesions in emergency medicine in general [50].

Dermatology presentations including rashes are a common reason for patients to seek attention in emergency departments with reports varying from 3.9% to 8% of all cases [51-53]. However, there is a lack of data on what percentage of these presentations involve rashes.

One retrospective study at regional Australian hospital reported non-specific rashes constituted 23.6% of all dermatology cases presenting to ED [54] whilst another study at a major metropolitan hospital reported non-infectious inflammatory skin conditions represented 21% of all dermatology ED presentations [55] and a Dutch study of 2222 dermatology consults identified 4.8% were dermatitis not otherwise specified [56]. A Spanish study of 3084 patient identified urticaria (7.6%), contact dermatitis (6.1%), and drug-induced reactions (4.6%) [57].

Whilst the vast majority of rashes represent benign conditions that are easily treated, there are some rashes that are stigmata of systemic conditions that might be overlooked in emergency department presentations resulting in delayed diagnosis and poor patient outcomes [58]. Only 2% of dermatologic presentations to ED are regarded as truly emergent [59].

However, this is an important topic for emergency medicine clinicians working in contexts without dermatology and other specialist services. A lack of knowledge and understanding of the relationship between rashes, systemic disease and which rashes represent possible emergent conditions and how these should be investigated represents a challenge for clinicians working in rural and remote emergency medicine.

Below is a table demonstrating several serious conditions that present with a variety of rashes that should not be missed.

Systemic Condition	**Associated Rash**
Infections such as Meningococcal septicaemia, Scarlet fever, toxic shock syndrome, necrotising fasciitis, measles, viral illnesses and other infective organisms	Petechial and purpuric rashes, viral exanthemous rashes, herpetic lesions, black eschar that sloughs, blisters, oedema, open wounds and many others
Anaphylaxis	Urticarial lesions, diffuse erythema
Urticarial Vasculitis	Urticarial lesions consisting of annular welts
Malignancy	Leukocytoclastic vasculitis presenting with palpable purpura and petechial rashes, Heliotropic rash and Gottren's papules, erythoderma,
Autoimmune conditions such as Sjogren's Syndrome, SLE, Rheumatoid Arthritis, ANCA positive vasculitides, Polyarteritis Nodosum, Behcet's Disease, Thrombotic Thrombocytopenic Purpura, Inflammatory Bowel Disease	Leukocytoclastic vasculitis presenting with palpable purpura, malar rash, petechiae
Kawasaki disease	Erythema multiforme, desquamation
Dermatomyositis	Heliotropic Rash and Gottren's papules
Adverse Cutaneous Drug Reactions	Wide range of rashes including palpable purpura, scaly plaque-like lesions, lichenoid rashes and many others
Erythema Multiforme	Red patches and targetoid lesions
Steven Johnson Syndrome, Toxic Epidermal Necrolysis, Erythema Multiforme Major	Annular plaques, Diffuse erythema, macules, fluid filled blisters spread with lateral pressure (Nikolsky's sign), desquamation of epidermis, hair and nail shedding
Bleeeding diastheses	Petechial rashes and echymoses
Pupura Fulminans/Disseminated Intravascular Coagulation	Purpuric lesions, haemorrhagic necrosis

Table 3: Examples of Systemic Conditions Associated with Rashes Not to Miss in the Emergency Department.

A possible approach to inflammatory skin lesions with a suspected systemic aetiology in emergency departments where dermatology services are not directly available is provided in Figure 7. This is based on how the primary author manages inflammatory skin lesions and literature from Duong and Suresh [60-63].

Punch biopsies play a critical role in the diagnosis of unusual rashes, however are not routinely performed in emergency

departments. This is for several reasons.

Emergency departments located in large metropolitan areas have access to a wider range of services and can refer patients to other services such as primary care where they can receive biopsies, appropriate serology, dermatology and other medical specialty review in a timely manner. In such contexts the need to perform a biopsy in the ED is reduced, or eliminated.

Secondly, the majority of tests including biopsy and autoimmune serology take several days to become available requiring follow up by emergency department clinicians, which is something that is usually done by general practitioners, or specialist teams. Many emergency department clinicians are reluctant to take on additional responsibility of following up an outpatient once they have been discharged from the ED.

Thirdly there are additional departmental costs for ordering specialty serology, pathology and imaging tests that can be performed elsewhere.

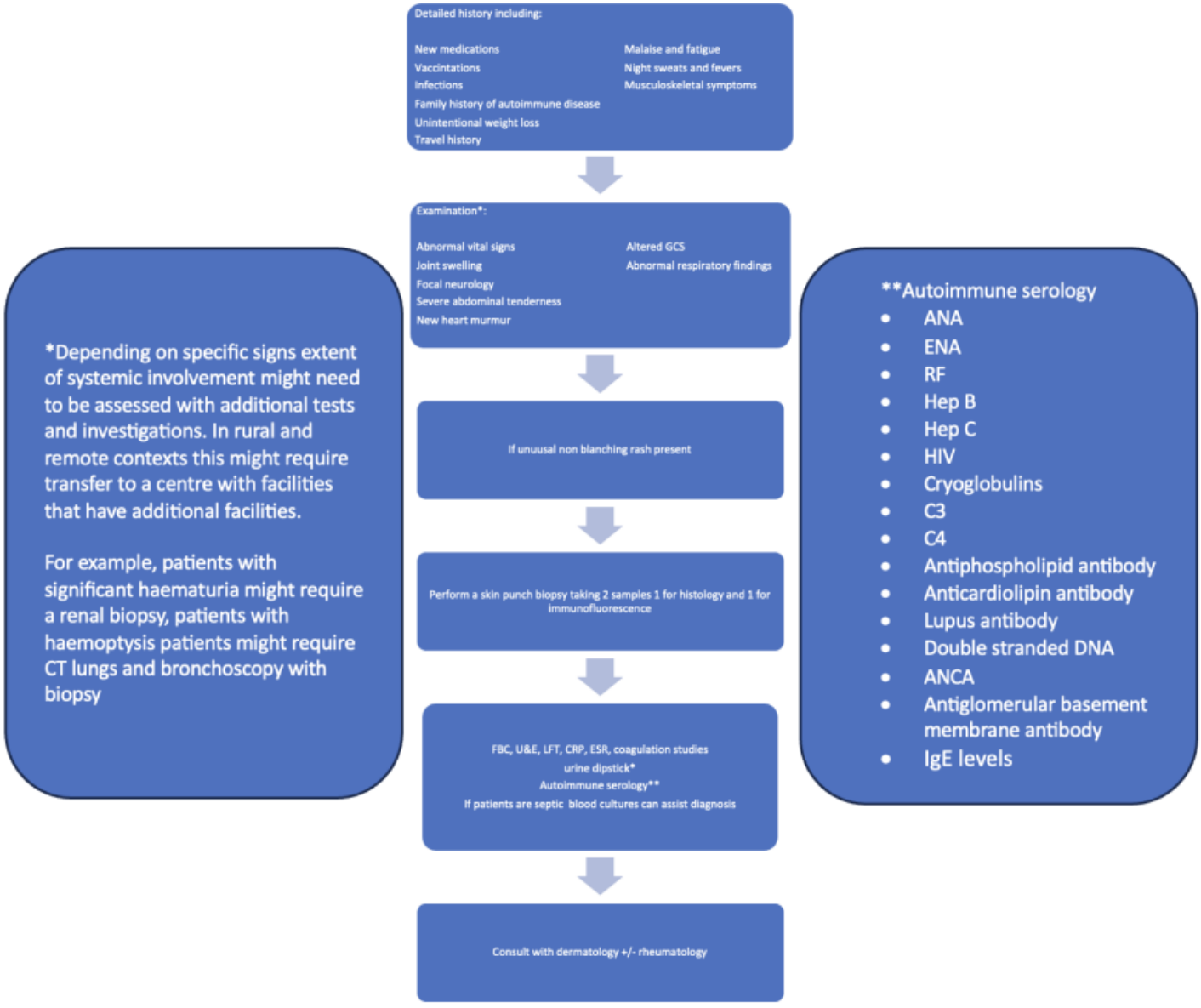


Figure 7: Protocol for Management of Rashes with Suspected Systemic Aetiology in Emergency Medicine.

Table 4 Key Learning Points
• The key differentials for a leukocytoclastic vasculitis in the context of IE are purpura fulminans, thrombocytopenic purpura, systemic lupus erythematosus, mixed cryoglobulinemia, urticarial vasculitis and ecythyma gangrenosum • Rarely IE can cause leukocytoclastic vasculitis that can reveal IgAV, or cryoglobulinemia • The clinical suspicion of IgAV should be high in any patient who presents with palpable non blanching purpura in the setting of IE • In patients who develop acute renal failure in IE, a negative skin biopsy does not rule out the diagnosis of IgAV and a renal biopsy is essential to making the diagnosis • 15% of patients with IgAV can have low complement and this does not rule out the diagnosis • Renal failure develops in 55% of cases within 3 months of the development of purpura therefore close monitoring of renal function is required • 30% of patients with IE can present with ANCA positivity • *Enterococcus faecalis* is associated with gastrointestinal malignancy and patients should be appropriately screened • In rural settings, emergency departments play an important role in diagnosis where GP shortages mean ED departments are the only places skin biopsies might be performed • The development of local protocols for management of inflammatory rashes when suspecting an underlying systemic condition should be encouraged and the authors propose such a protocol in Figure 7 • Punch biopsies should be performed in rural and remote emergency settings when there are no dermatology, or rheumatology services available, especially if there is a delay in patient ability to access these through a GP service. • Many unusual rashes including the vasculitides and unusual lesions are associated with underlying occult malignancies and patients should be screened for these

Conclusion

IgAV has been reported in the literature in association with a range of infective organisms in the setting of infective endocarditis, but there are few case reports in the literature in association with *E Faecalis*. IgAV is not documented in association with CDRIE. This case is interesting in a rural emergency department setting and highlights the importance of rheumatology knowledge in emergency medicine contexts.

The main clinical features that should raise the suspicion for vasculitis in IE and CDRIE are a non-blanching palpable purpuric rash with, or without acute renal failure. Skin biopsy and a vasculitis screen are essential components of the diagnostic workup and should be performed in patients presenting with these findings.

Emergency departments where dermatology and rheumatology services are not readily available should develop protocols for assessment of sashes and inflammatory skin lesions where a suspected systemic condition might be suspected.

Better education of healthcare professionals working in emergency medicine can help to identify cases of IgAV where opportunistic biopsy in rural settings can assist with diagnosis and prevent delayed patient care.

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