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Granulomatosis with Polyangiitis (GPA) with a Severe Diffuse Alveolar Haemorrhage (DAH)- A Case Report

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BACKGROUND

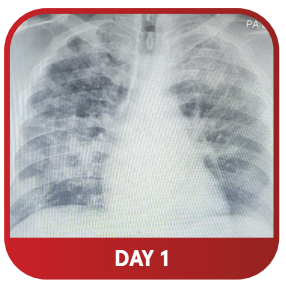
- Granulomatosis with Polyangiitis (GPA) is a rare Anti-Neutrophil Cytoplasmic Antibody (ANCA) mediated, medium to small vessel, necrotising vasculitis.
- Its annual incidence from a literature review ranges from 0.21 to 1.44 per 100 000 people in Europe (1).
- Diffuse alveolar haemorrhage (DAH) remains a rare, life-threatening manifestation of GPA, with a high mortality rate.
- DAH is characterised by the presence of haemoptysis, anaemia, diffuse pulmonary infiltrates on imaging, and a hypoxemic respiratory failure.

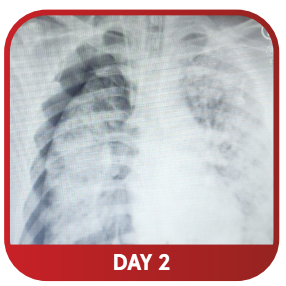
CASE PRESENTATION

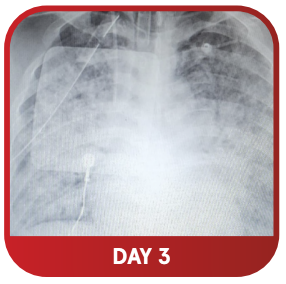
- A 45-year-old Malaysian Muslim presented with a fever, multiple recurrent mouth ulcers, odynophagia, dysphonia, maxillofacial sinus fullness and a paroxysmal nocturnal dyspnoea for a week.
- Further history taking also yielded a 2-month history of intermittent epistaxis and small volume haemoptysis.
- He was recently treated for infected nasal polyps and was scheduled for an elective Functional Endoscopic Sinus Surgery (FESS) by a Consultant ENT Surgeon in the upcoming week.
- On arrival, he was tachycardic at 120b/m with an oxygen saturation of 95% under room air. He soon deteriorated rapidly and required CPAP support with an admission to the Intensive Care Unit.
- His CRP and procalcitonin levels were elevated at 217mg/L and 4 ng/ml respectively. His haemoglobin level was low at 10.1 g/dL.
- Urinalysis yielded blood 2+ and protein 1+, but with a normal serum urea and creatinine level.
- His chest X ray demonstrated multiple bilateral interstitial opacities and was therefore treated for a pneumonia in sepsis. However, his clinical parameters worsened rapidly over the next few days despite being on Meropenem and Doxycycline.
- A CT thorax was not performed as he desaturated in the radiology department and required emergency endotracheal intubation. The intubation process yielded fresh blood gushing out from the upper airway which supported the occurrence of a diffuse alveolar haemorrhage.
- Repeat CXR also yielded new right pneumothorax, requiring chest tube drainage.
- His c-ANCA, namely the anti-Proteinase 3 (PR3) antibodies, returned positive at 93 IU/ml (reference range< 2IU/ML) on day 3 of admission.
- His p-ANCA, anti- glomerular basement membrane antibodies, ANA, anti-dsDNA, anti- ENA, C3 and C4 were negative. His cryoglobulin studies, Hep B, Hep C and HIV screening were negative.
- Intravenous Methylprednisolone and Cyclophosphamide was then promptly initiated. However, he deteriorated with an oliguric acute kidney injury and metabolic acidosis.
- Plasmapheresis could not be initiated due to a refractory cardiogenic shock with ventricular tachycardia. Unfortunately, the patient deceased on day 4 of admission.

INVESTIGATIONS

	Reference Range	18/10/2022 (Baseline)	29/01/2025	30/01/2025	31/01/2025 (Post Transfusion)
Hb	13-18 g/dL	14.3	10.1	9.3	11.7
Haematocrit	41-53%	45	32	29	38
WCC	4.3-10.5 x10^3/µL	7	7.9	8.7	17.1
Platelet	150-450 x10^3/µL	291	244	186	67
Urea	2.0-6.8 mmol/L	2.6	9.8	14.1	17.7
Creatinine	99-104 µmol/L	79	100	116	142
CRP	<5 mg/L			217	218.7
ESR	0-15 mm/hr			23	2
Procalcitonin(PCT)	<0.10 ng/ml			4	2.4
Lactate	0.5-2.2 mmol/L		2.3		
INR	0.8-1.2	0.9	1.47	1.60	2.44
Troponin T	<0.014 ng/ml		0.107		

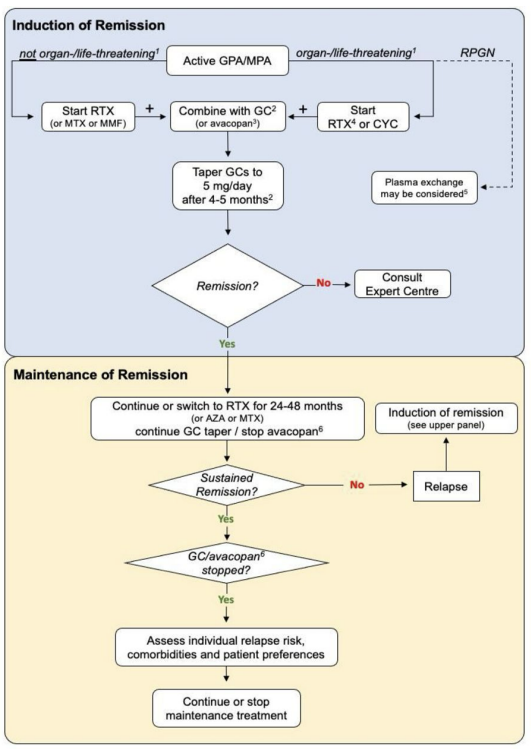






2022 ACR/EULAR Diagnostic Criteria Score for GPA: 10

EULAR 2022 Treatment Algorithm Recommendation for GPA (2):



DISCUSSION

- Patients with GPA and DAH are normally males in their 40s, with anaemia, haemoptysis and renal impairment on admission. (3)
- The presence of hemosiderin-laden macrophages from bronchoalveolar lavage (BAL) is diagnostic for DAH. (3)
- Extracorporeal Membrane Oxygenation (ECMO) may serve as a salvage procedure for DAH as it increases survivability. (used in 38% of case reports). (3)(4)
- The average mortality rate across studies ranged from 15% to 36%. (3)
- The disproportionality of the ratio between a serial CRP and PCT trend, with or without improvements from antibiotics administration, should spark future research interest as an initial means of identifying vasculitis as a possible aetiology.
- It may serve as an early parameter to drive prompt life-saving interventions, while waiting for more definite immunological test results to be available.

CONCLUSION

- GPA remains an important differential for DAH alongside Microscopic Polyangiitis and Goodpasture's Syndrome.
- The EULAR treatment recommendation for an organ threatening disease involves the usage of high dose glucocorticoids or avacopan, cyclophosphamide or rituximab with or without plasmapheresis.

REFERENCES

Watts RA, Mahr A, Mohammad AJ, Gatenby P, et al. Classification, Epidemiology and Clinical Subgrouping of Antineutrophil Cytoplasmic Antibody (ANCA)-associated Vasculitis. Nephro.Dial.Transplant.2022 April; 30(1): i14–122.Available from: https://doi.org/10.1093/ndt/gfv022

Hellmich B, Sanchez-Alamo B, H Shirmer J et al. EULAR Recommendations for the Management of ANCA Associated Vasculitis: 2022 Update. BMJ Annals of the Rheumatic Disease. 2022; 82(1).

Da Silva RC, Adhikari P. Granulomatosis with Polyangiitis Presenting with Diffuse Alveolar Haemorrhage: A Systematic Review. Cureus. 2022 Oct 4;14(10):e29909.DOI:10.7759/cureus.29909. PMID: 36348918; PMCID: PMC9632681.

Wan R, Yang W, MA X, Pan P, et al. ECMO Rescues Patients with Acute Respiratory Failure Related to GPA. Front Med (Laussane). 2021 May; 8: 671396. DOI: 10.3389/fmed.2021.671396. PMID: 34124098; PMCID: PMC8192709