A case of DHTR in the setting of COVID-19

Georgina Santiapillai

ST3 Haematology

The Whittington Hospital

History

- 25 year old woman, HbSS
  - Clinically severe
  - Baseline values: Hb 60, LDH 500, Bili 40, Retics 134, Spo2 96 RA.
  - >300 days in hospital a year with VOC
  - Opiate tolerance

- Relevant Past history
  - Aplastic crisis due to parvovirus, 1997 - transfused
  - Severe DHTR Jan 2016 with negative antibodies initially, but anti S subsequently detected in May 2016
  - Intermittent Hydroxycarbamide 2016, 2019 discontinued of her own accord.

History

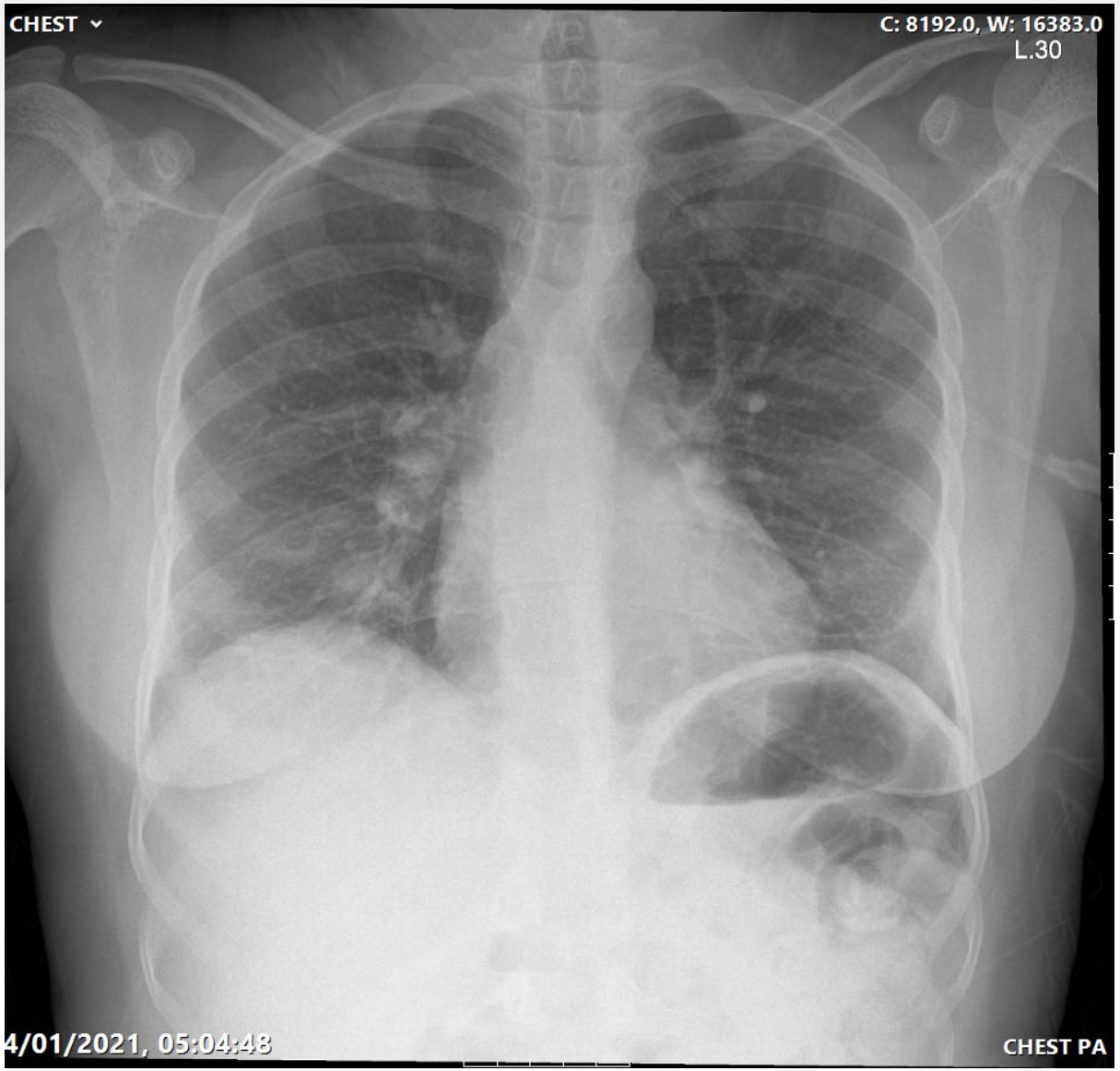
Admitted on 04/01/21

- Vaso-occlusive crisis
  - Chest and Back pain
  - Commenced on usual pain management

Admission bloods 4/1/21

- Full blood count
  - Hb 53 (115-165g/L)
  - WCC 14.4 (3.5-12x10^9/L)
  - PLT 498 (140-400x10^9/L)
  - Neut 10.0 (1.7-7.5 x10^9/L)
- Reticulocytes
  - Percentage 7.73%
  - Absolute 136.8 x10^9/L
- Bilirubin 44
- LDH 544

Admission CXR



History

- **Day 2**
  - Admission COVID-19 swab = positive
  - Febrile but no chest symptoms
  - Continued on usual pain management
  - Commenced on empirical antibiotics – Tazocin and Clarithromycin

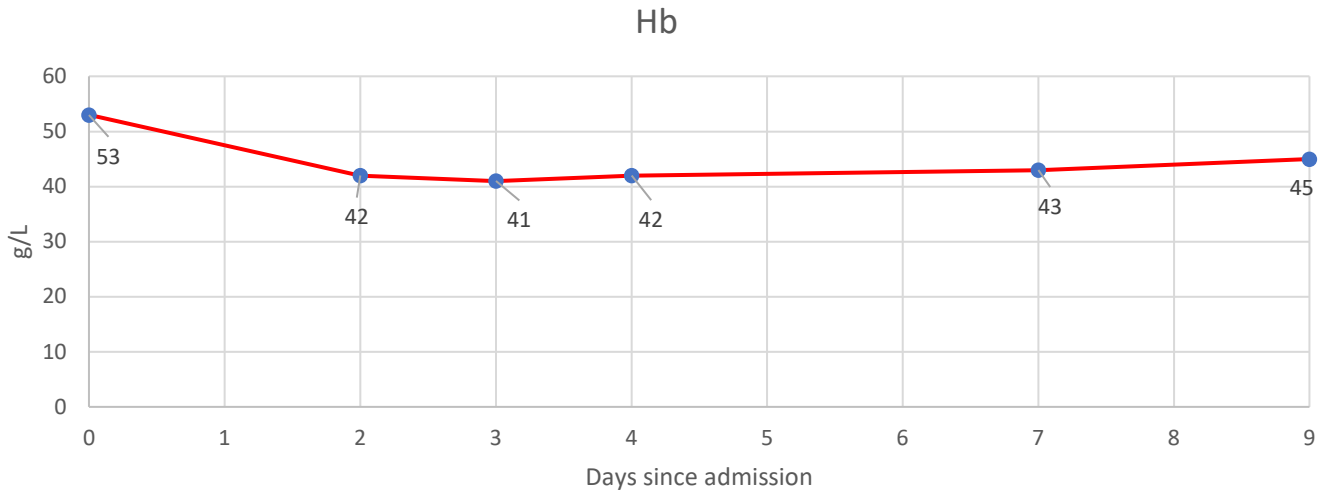
History

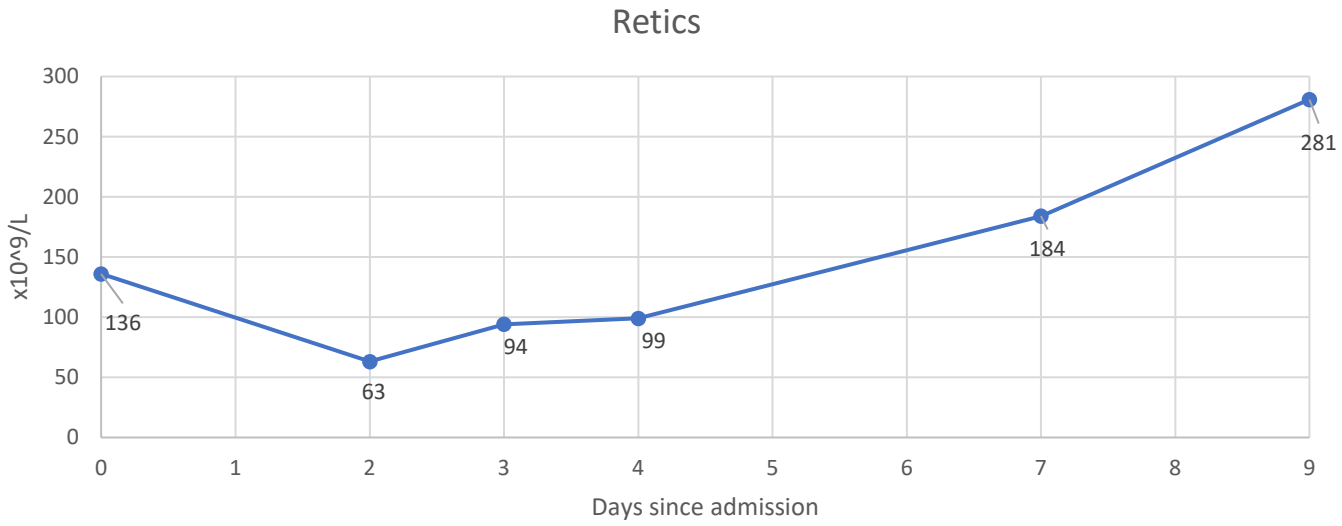
- **Day 6**
  - Desaturation + oxygen requirement
  - Started on PO Dexamethasone as per local hospital protocol

- **Day 9**
  - Adamant wants to leave hospital despite risks
  - Sats 88 RA
  - Facilitated discharge with hospital at home monitoring

Trend in Hb and Retics

Pt baseline values:
Hb 60g/L
Retics 134 x10^9/L



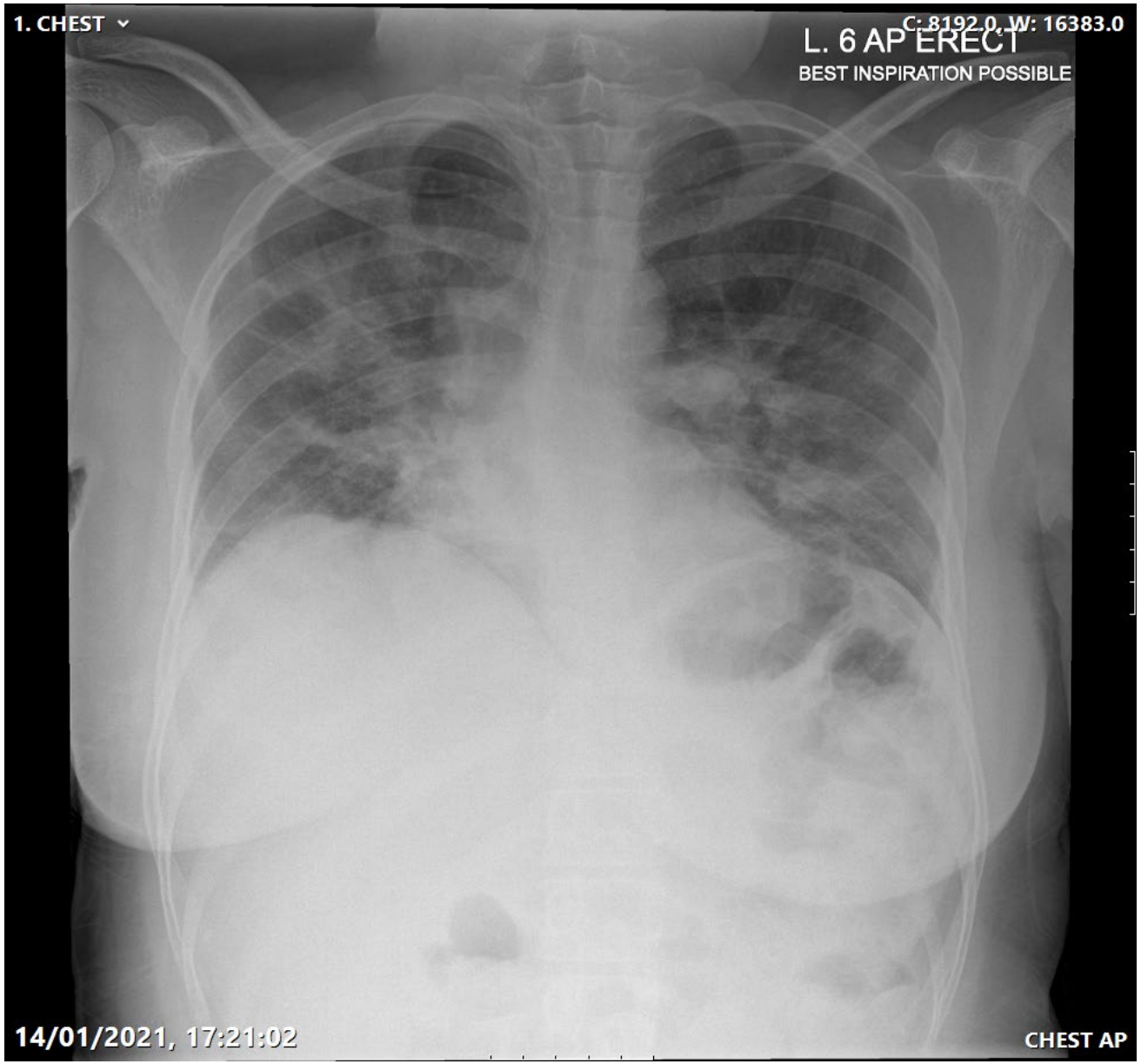


History

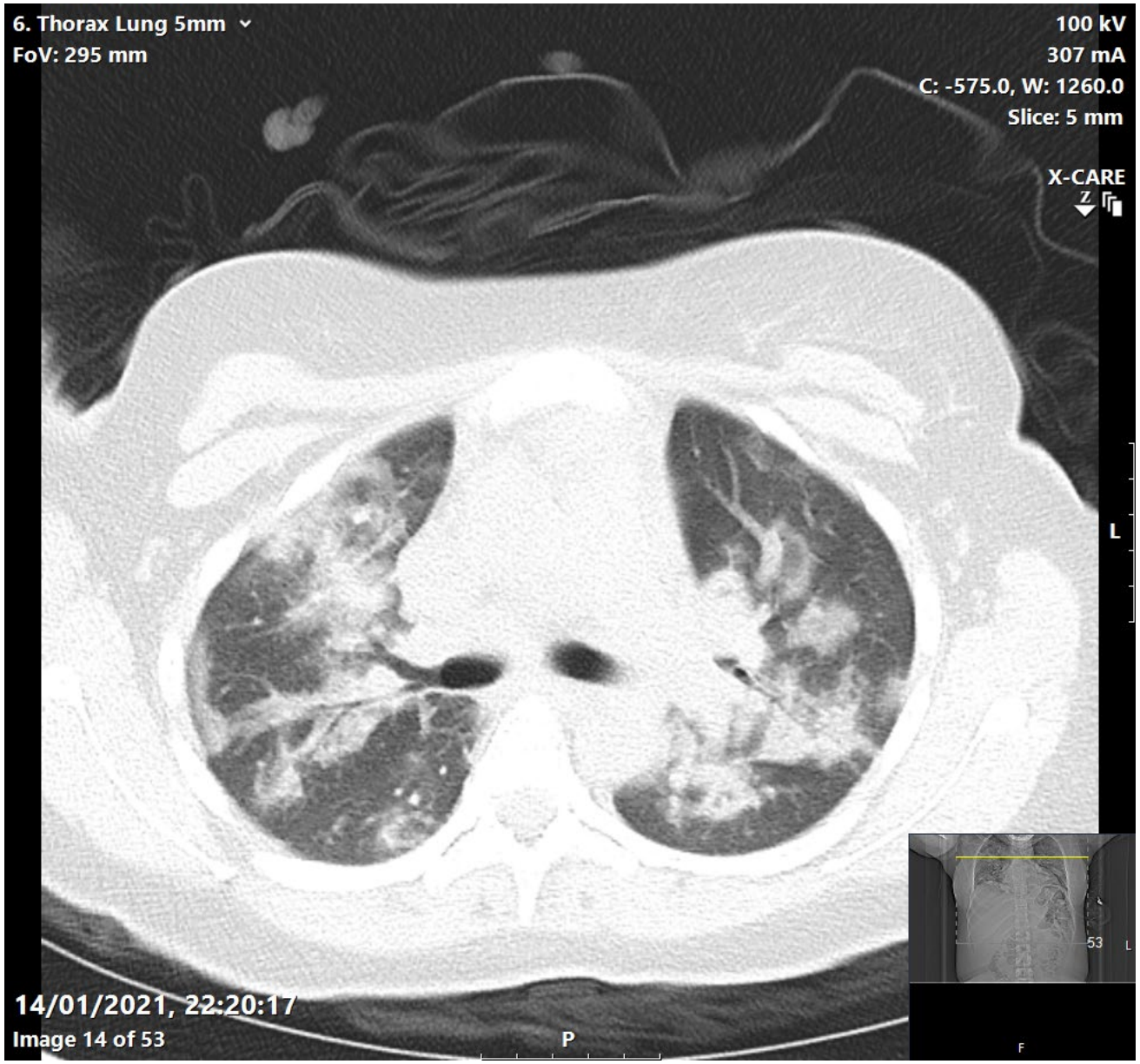
- **Day 10**
  - Re-admitted <12hrs later
  - Unable to manage at home due to breathlessness

- **Day 11**
  - Sats 93 RA, unable to complete full sentences
  - CTPA : 50-75% of lungs affected by COVID.

CXR


1. CHEST
C: 8192.0 W: 16383.0
L. 6 AP ERECT
BEST INSPIRATION POSSIBLE
14/01/2021, 17:21:02
CHEST AP

CTPA


6. Thorax Lung 5mm
FoV: 295 mm
100 kV
307 mA
C: -575.0, W: 1260.0
Slice: 5 mm
X-CARE
L
14/01/2021, 22:20:17
Image 14 of 53
P
53
L
F

Day 11 bloods – re-admission

- Full blood count
  - Hb 43 (115-165g/L)
  - WCC 40.1 (3.5-12x10^9/L)
  - PLT 499 (140-400x10^9/L)
  - Neut 28.7 (1.7-7.5 x10^9/L)
- Reticulocytes
  - Percentage 10.39 %
  - Absolute 151.7 x10^9/L
- CRP 77
- Bili 46
- LDH 544

Discussions within red cell team

- **Red cell top up transfusion advised**
  - 4 units RBC
  - Pre med :Methylprednisolone 500mg IV and IVIg 1g/kg
  - EPO 10,000 IU daily
  - Continued on Folic Acid
  - PICC line inserted
  - Split standard intensity LMWH for line
  - To consider Rituximab if the need for re-transfusion arises.

Events post transfusion…

Bloods post top up transfusion

- Full blood count
  - Hb 97 (115-165g/L)
  - WCC 30.2 (3.5-12x10^9/L)
  - PLT 579 (140-400x10^9/L)
  - Neut 22.6 (1.7-7.5 x10^9/L)

- Reticulocytes
  - Percentage 8.11%
  - Absolute 279.8 x10^9/L

- LDH 495

Haemoglobinopathy screen

Hb A 61%

Hb S 37%

Hb F 2%

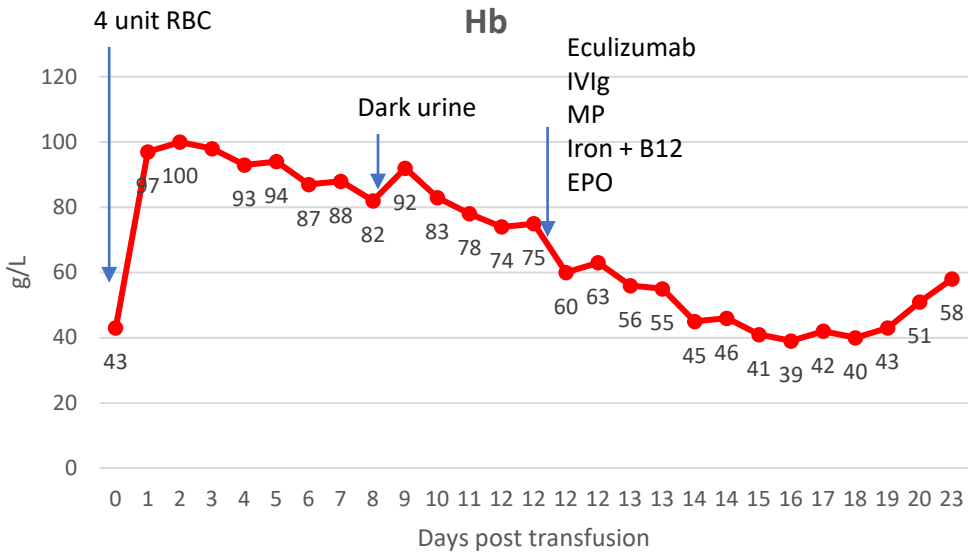
Post transfusion history

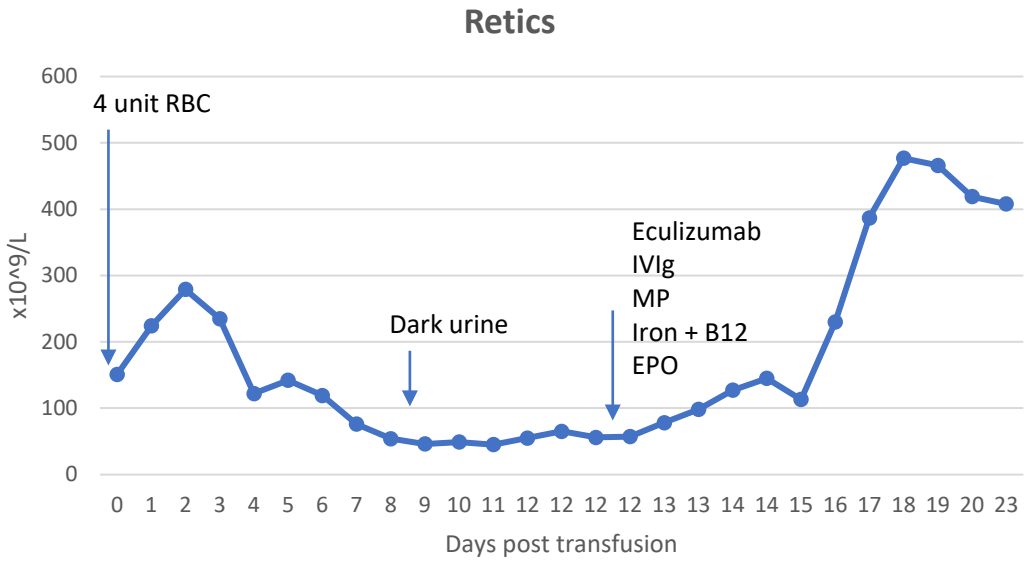
Day 1

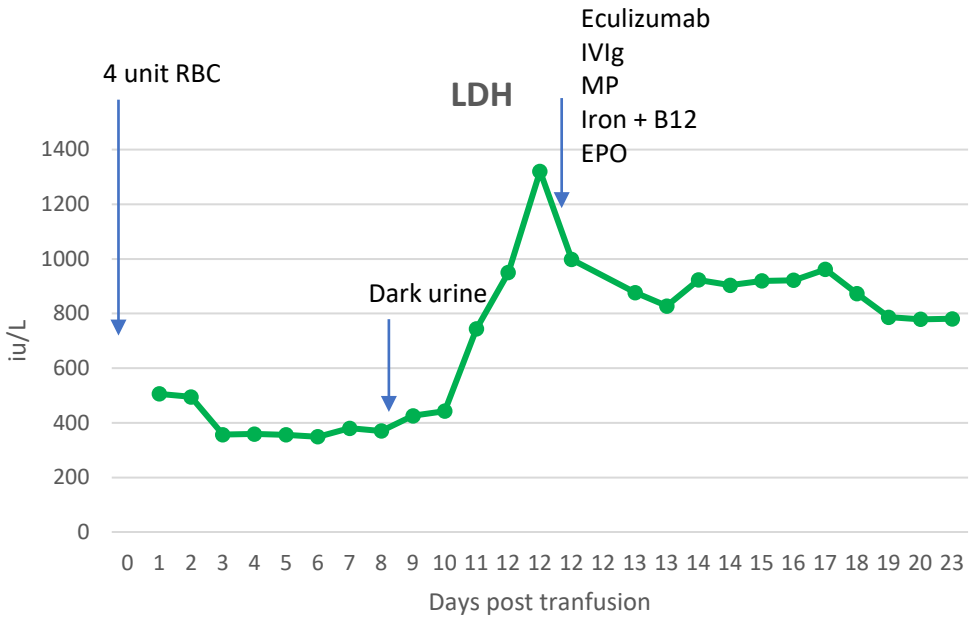
- Improvement in clinical status
- No oxygen requirement
- Pain symptoms better

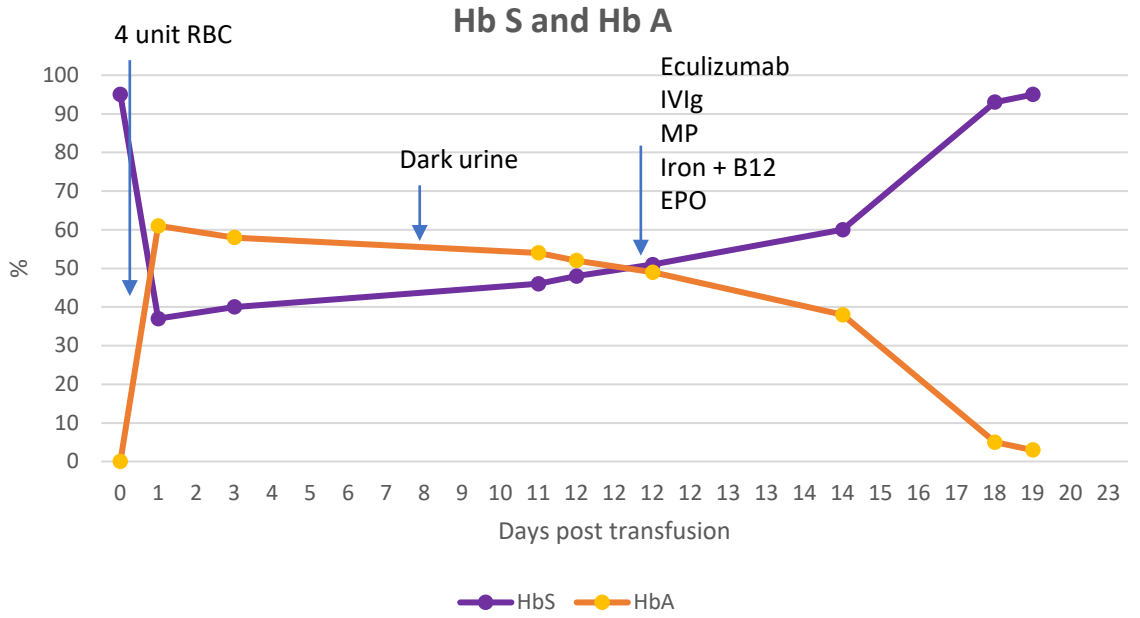
Post transfusion history

- **Day 12**
  - Reviewed
  - Passing dark urine – started 2-3 days prior
  - Urine dip 3+ bld
  - Severe headache – CT head nad
  - Severe pain all over


Hb
4 unit RBC
Dark urine
Eculizumab
IVIg
MP
Iron + B12
EPO
g/L
Days post transfusion


Retics
4 unit RBC
Dark urine
Eculizumab
IVIg
MP
Iron + B12
EPO
x10^9/L
Days post transfusion


LDH
4 unit RBC
Dark urine
Eculizumab
IVIg
MP
Iron + B12
EPO
iu/L
Days post tranfusion


Hb S and Hb A
4 unit RBC
Dark urine
Eculizumab
IVIg
MP
Iron + B12
EPO
%
Days post transfusion
HbS
HbA

Other results

- **Immunohaematology**
  - DAT IgG 1+ C3d -ve (NHSBT tested) ? IVIg effect
  - No new alloantibody detected

2 months later (still an inpatient)

- Episode of acute desaturation
  - SpO2 85RA
- ? Acute Chest Syndrome

2 month later (still an inpatient)

- Full blood count
  - Hb 53 (115-165g/L)
  - WCC 19.9 (3.5-12x10^9/L)
  - PLT 485 (140-400x10^9/L)
  - Neut 9.0 (1.7-7.5 x10^9/L)
- Reticulocytes
  - Absolute 205 x10^9/L
- LDH 537
- CTPA 3/3/21: no PE, residual COVID related lung changes.

→ Supportive management

Progress - currently

- Patient now taking prophylactic penicillin (previously non-compliant) due to eculizumab administration
- Ongoing attendances with VOC
- Still taking EPO

Challenges and Lessons

Challenges & Lessons

- Place of care – bed capacity in ITU
- Eculizumab – logistics
  - Stock
  - Familiarity
- More complex clinical picture

NHS England

Clinical Commissioning Policy;
Rituximab and eculizumab for the prevention and management of delayed haemolytic transfusion reactions and hyperhaemolysis in patients with haemoglobinopathies [URN 1821] [200602P]

Definitions

Definitions – DHTR

ASH guideline 2020

- A significant drop in haemoglobin within 21 days post-transfusion associated with 1 or more of the following:
  - new red cell alloantibody
  - Haemoglobinuria
  - accelerated HbS% increase with a concomitant fall in HbA post-transfusion
  - relative reticulocytopenia or reticulocytosis from baseline
  - significant LDH rise from baseline
  - and exclusion of an alternative cause

Definitions – Hyperhaemolysis

ASH guideline 2020

- A rapid haemoglobin decline to below the pretransfusion level and rapid decline of the post-transfusion HbA level.

Complications during DHTR

	%
Acute Chest Syndrome	50.5
Hepatic impairment	25.3
Pulmonary Hypertension	16.2
Kidney Failure	10.1
Death	6

- *Delayed hemolytic transfusion reaction in adult sickle-cell disease: presentations, outcomes, and treatments of 99 referral center episodes. Habibi et al 2016.*

Thank you