

MULTIPLE MYELOMA

A case study about multiple myeloma

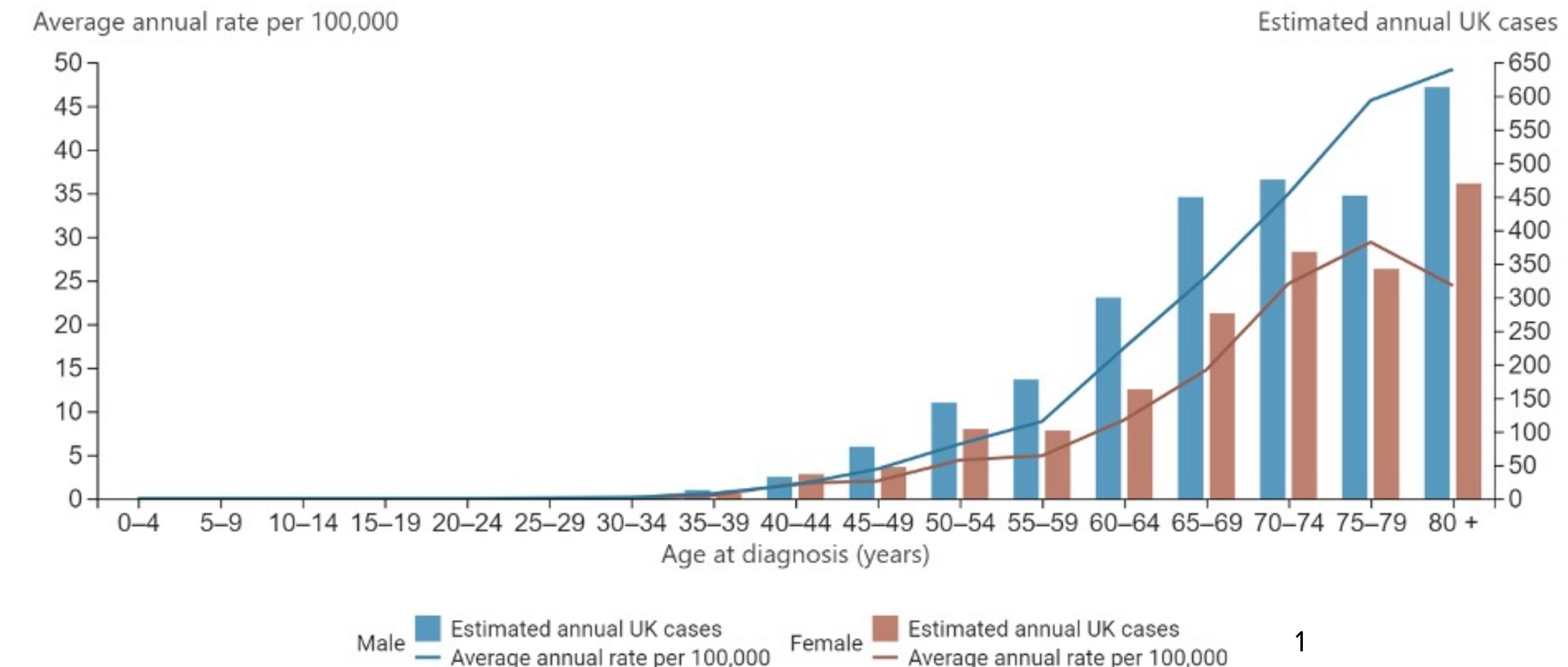
LUCÍA LÓPEZ CLAVAÍN

TABLE OF CONTEXT

- Overview of myeloma
- Initial investigation and clinical manifestation
- Diagnosis
- Treatment
- Monitoring
- Prognosis

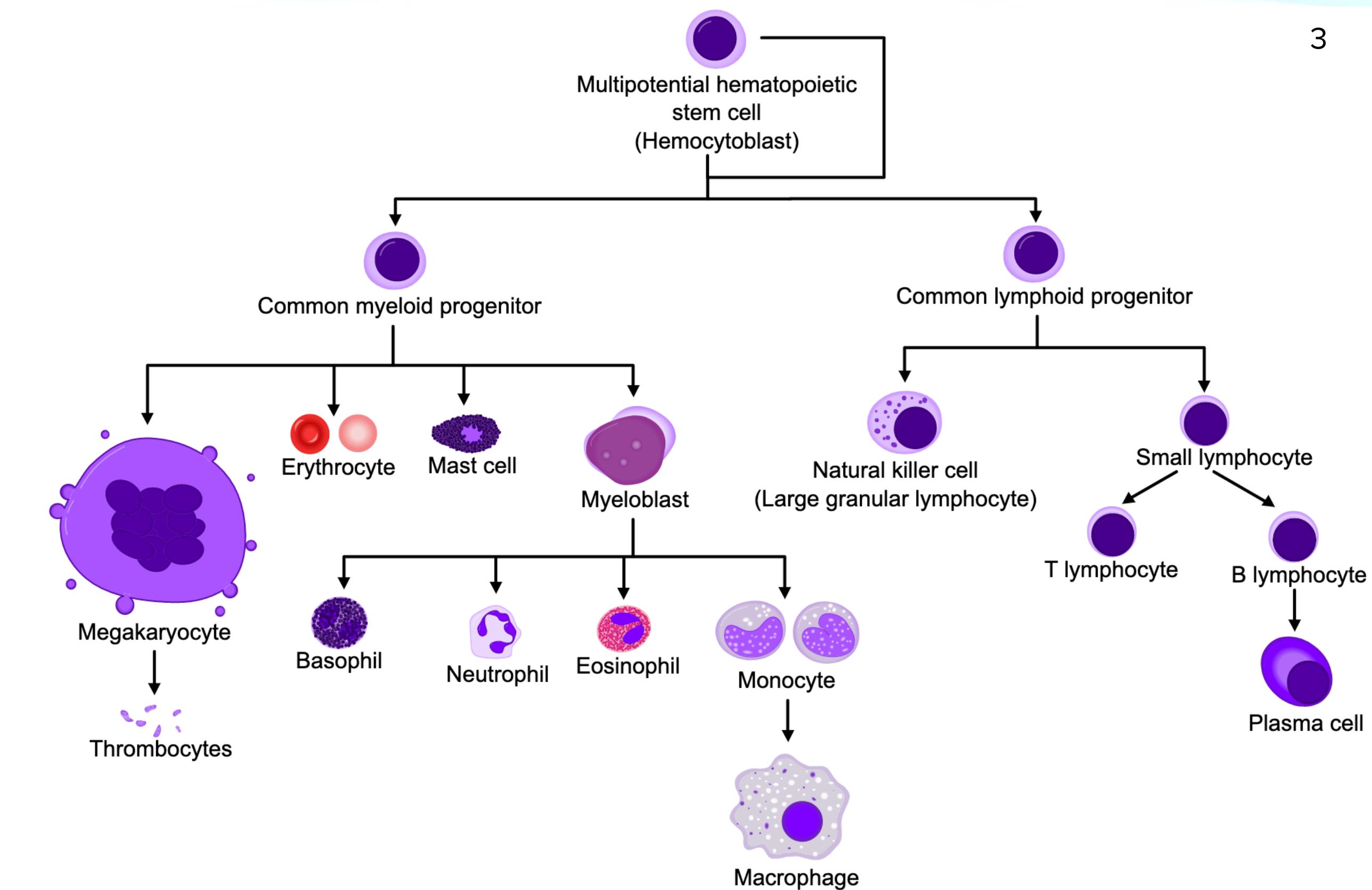
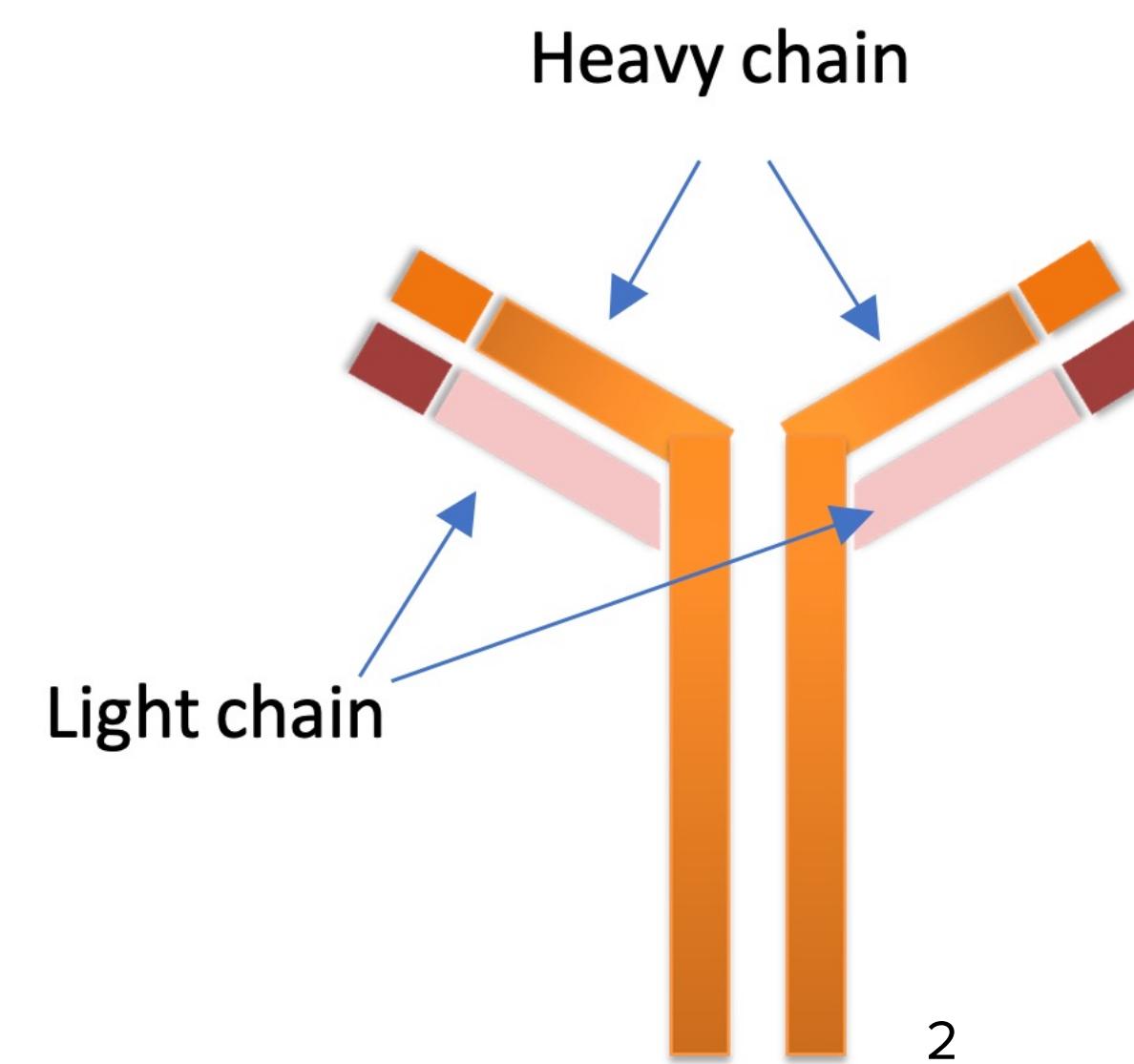
OVERVIEW OF MYELOMA

- What is multiple myeloma?
- 58% male to 42% female ratio
- It is generally a disease of older age
- Slightly higher incidence in Afro-Caribbean populations



OVERVIEW OF MYELOMA

- Bone marrow is found in the centre of bones
- Plasma cells are derived from the lymphoid stem cells.
- Immunoglobulins are antibodies produced by plasma cells



INITIAL INVESTIGATION AND CLINICAL MANIFESTATION

INITIAL INVESTIGATION & CLINICAL MANIFESTATIONS

- Clinical manifestations of myeloma can be very broad
- GP consultation for a general screening
 - U&E, FBC, glucose and LF
- This ends up with a referral to a medical team to do further investigation.



Hypercalcaemia

- Hypercalcaemia (high calcium) is related to pathological bone fracture, decrease in renal function (urinary tract infection), abdominal pain, high probability of catching a cold, dehydration, and cognitive effects such as depression or confusion.
- Myeloma is not the only cause of high calcium, but it is something to take into consideration when the calcium results are high.



Anaemia

- The bone marrow failure when the bone marrow is too crowded with plasma cells to produce blood cells, which leads to anaemia



Renal insufficiency

- Renal damage due to the paraprotein as the free light chains get stuck in the tubules causing cast nephropathy and inducing kidney failure.
- There is an increase of serum and creatine that the kidney cannot get rid of it.



Bone lesions

- Persistent pain (more than 4-6 weeks) in the ribs or back.
- Spontaneous fractures, pathological bone fracture associated with hypercalcaemia

- Other clinical manifestations

Amyloid
disease

Hyper
viscosity
syndrome

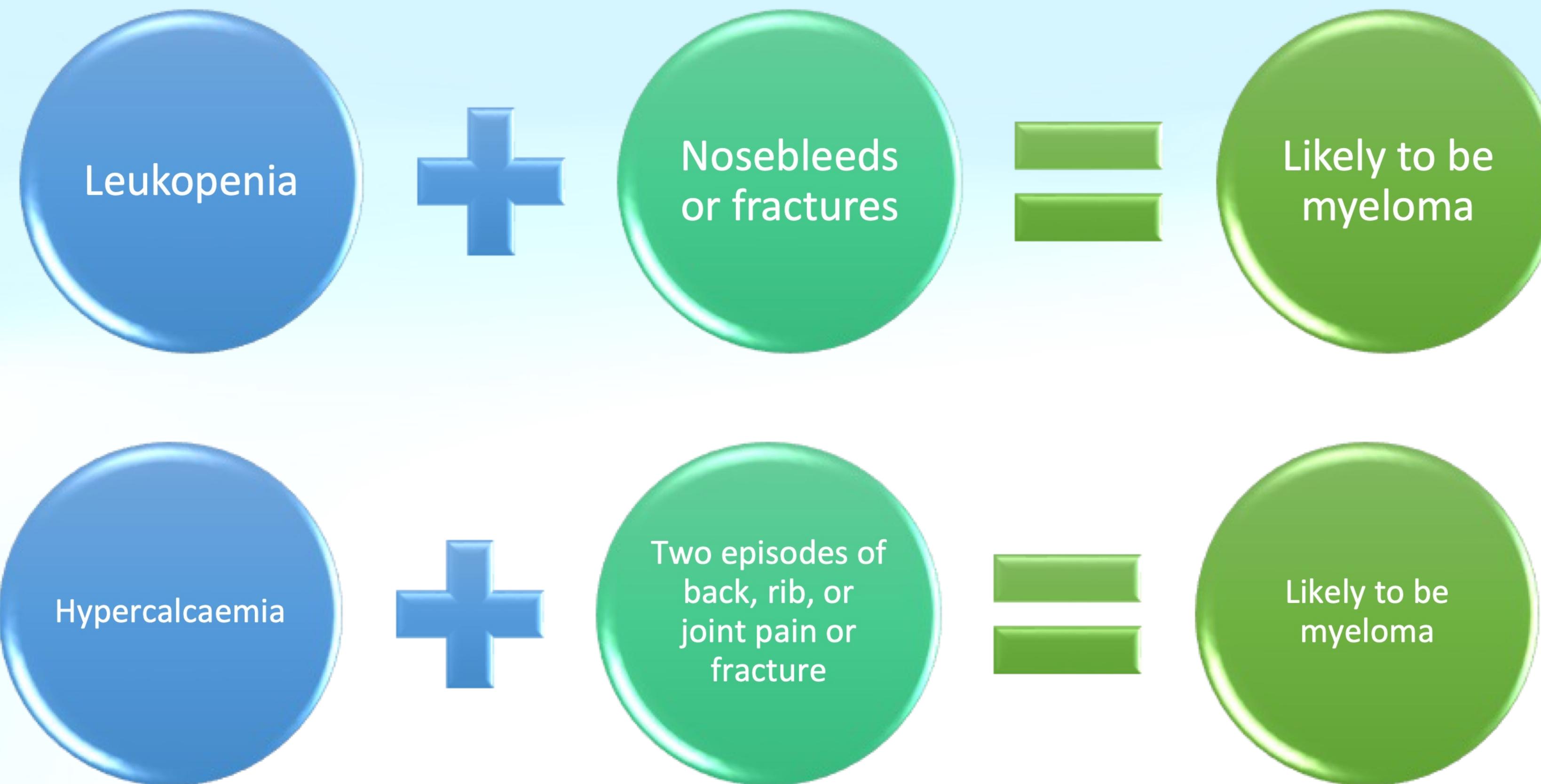
Spinal cord
compression

Recurrent
infections

Lytic lesions
bone

Fatigue and
breathlessness

Even though the symptoms can be very broad, there are different symptoms that whenever they arise in combination can indicate myeloma.



PATIENT

69-year-old male patient

August 2020

Wrist and joint pain

Disease-modifying
anti-rheumatic
drugs treatment

Sulfasalazine

Chest pain and fatigue
GP consultation with
alarming results after
basic screening

End of January
2022

End of January 2022
Admission hospital

FBC: low RBC, low HCT, Low PLT. Anaemic

AKI: Acute kidney injury established

Bone exam: lytic bone lesions

Calcium: hypercalcaemia

Total protein
UBJ + UIMF
Serum Electrophoresis + Immunotyping and immunofixation
Blood FILM
Bone marrow

March 2022
Start of treatment

Chemotherapy

February 2022
Diagnosis

DIAGNOSIS

DIAGNOSIS

Tests used in the diagnosis

Chemistry

Serum tests

Serum protein electrophoresis

Immunotyping

Immunofixation

General tests

BJP

Immunofixation

U&E

Haematology

FBC

Bone marrow aspirate

Imaging techniques

Blood bank

X-rays

Blood grouping

FULL BLOOD COUNT AND BLOOD FILMS

HAEMATOLOGY



- FBC identifies anaemia and cytopenias like thrombocytopenia in a patient.
- Blood film to confirm the presence of rouleaux.
- Plasma viscosity test

GENERAL TESTS

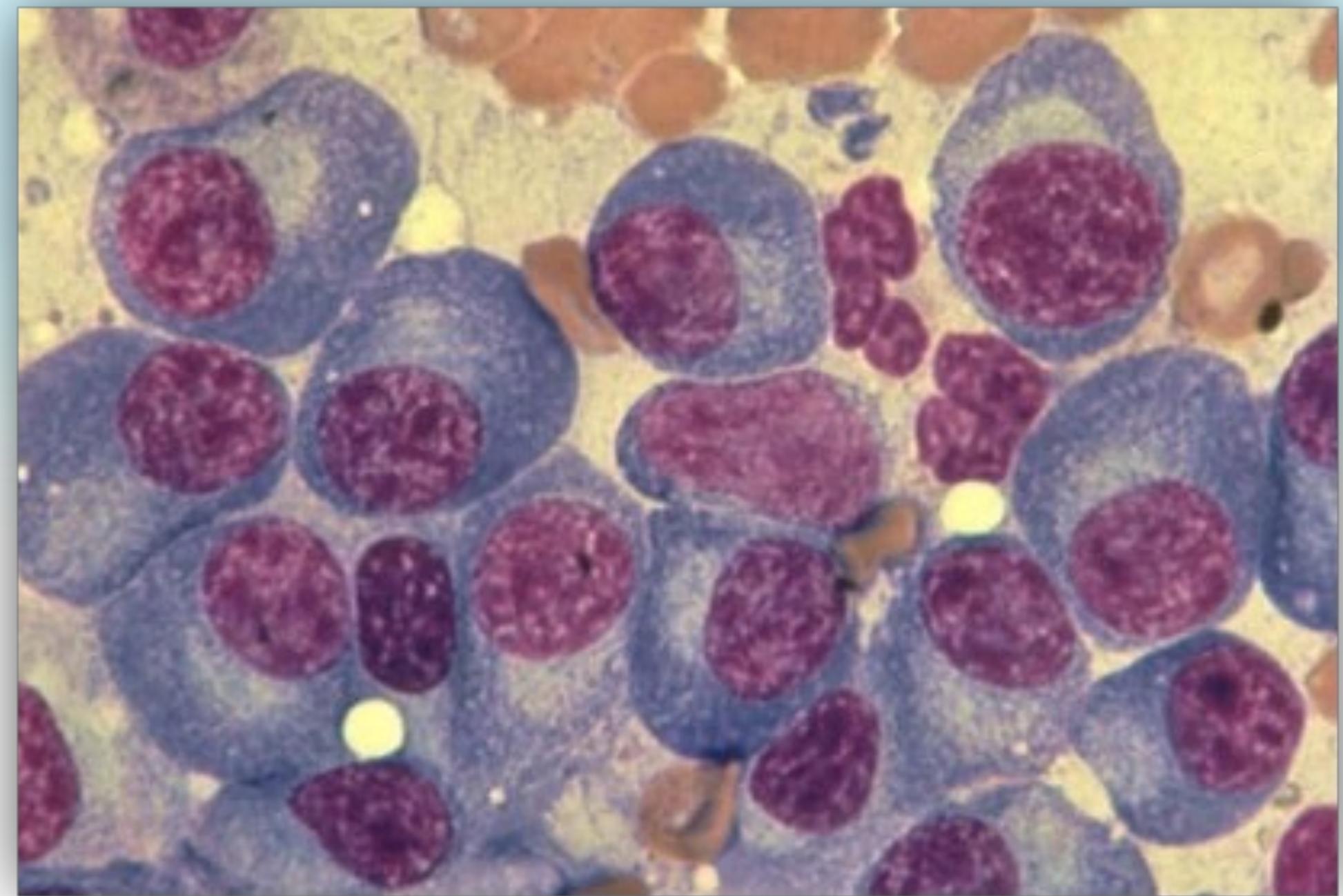
CHEMISTRY. SERUM BASED TESTS

- Urea and electrolyte profile
- Liver function
- Bone profile
- Lactate dehydrogenase, LDH
- Urea
- Uric acid

BONE MARROW ASPIRATE AND TREPHINE BIOPSY

HAEMATOLOGY

- Bone marrow aspirate is obtained by inserting a needle into the posterior pelvis
- The particles are then spread on glass slides, stained, and examined for plasma cells.

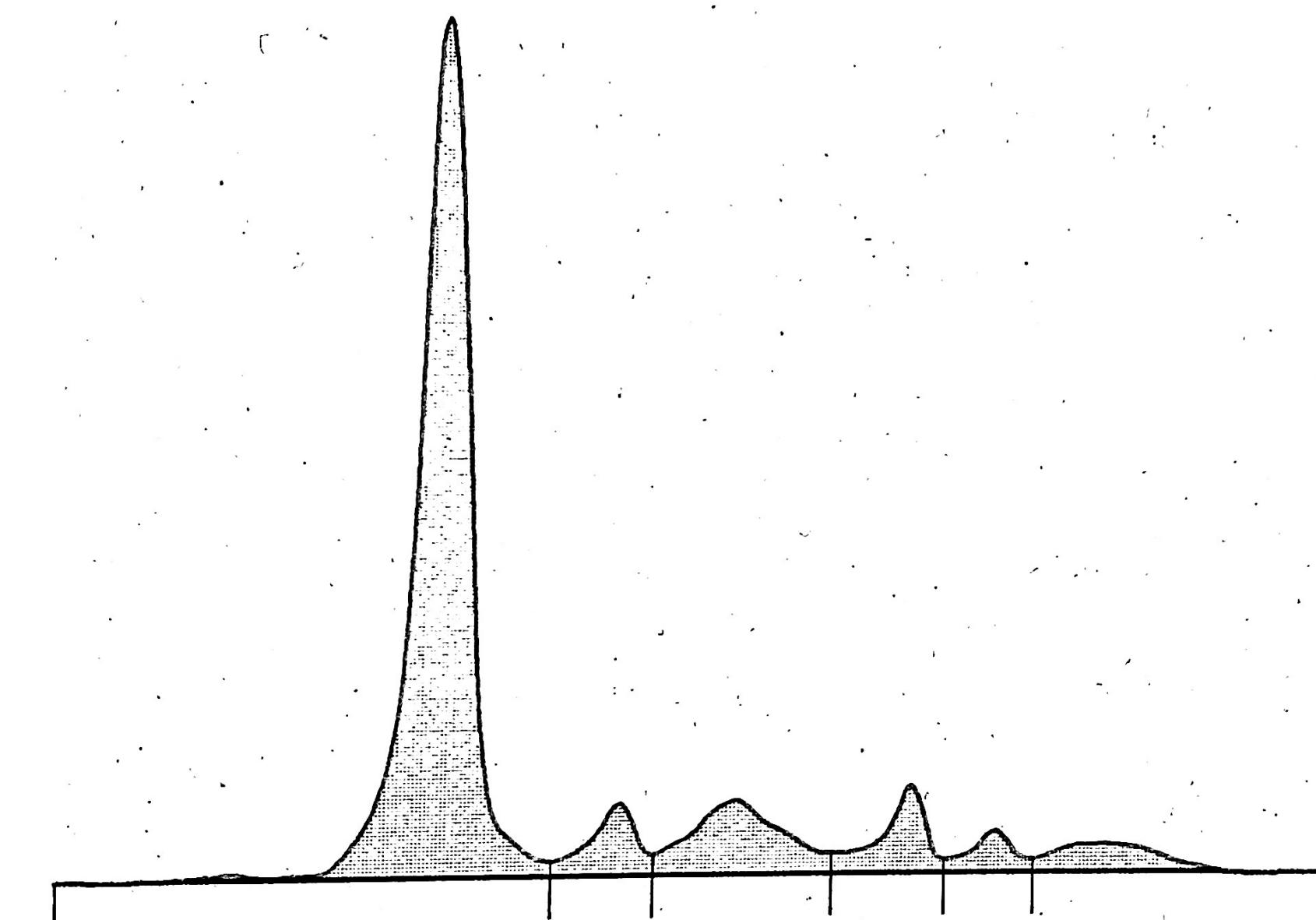
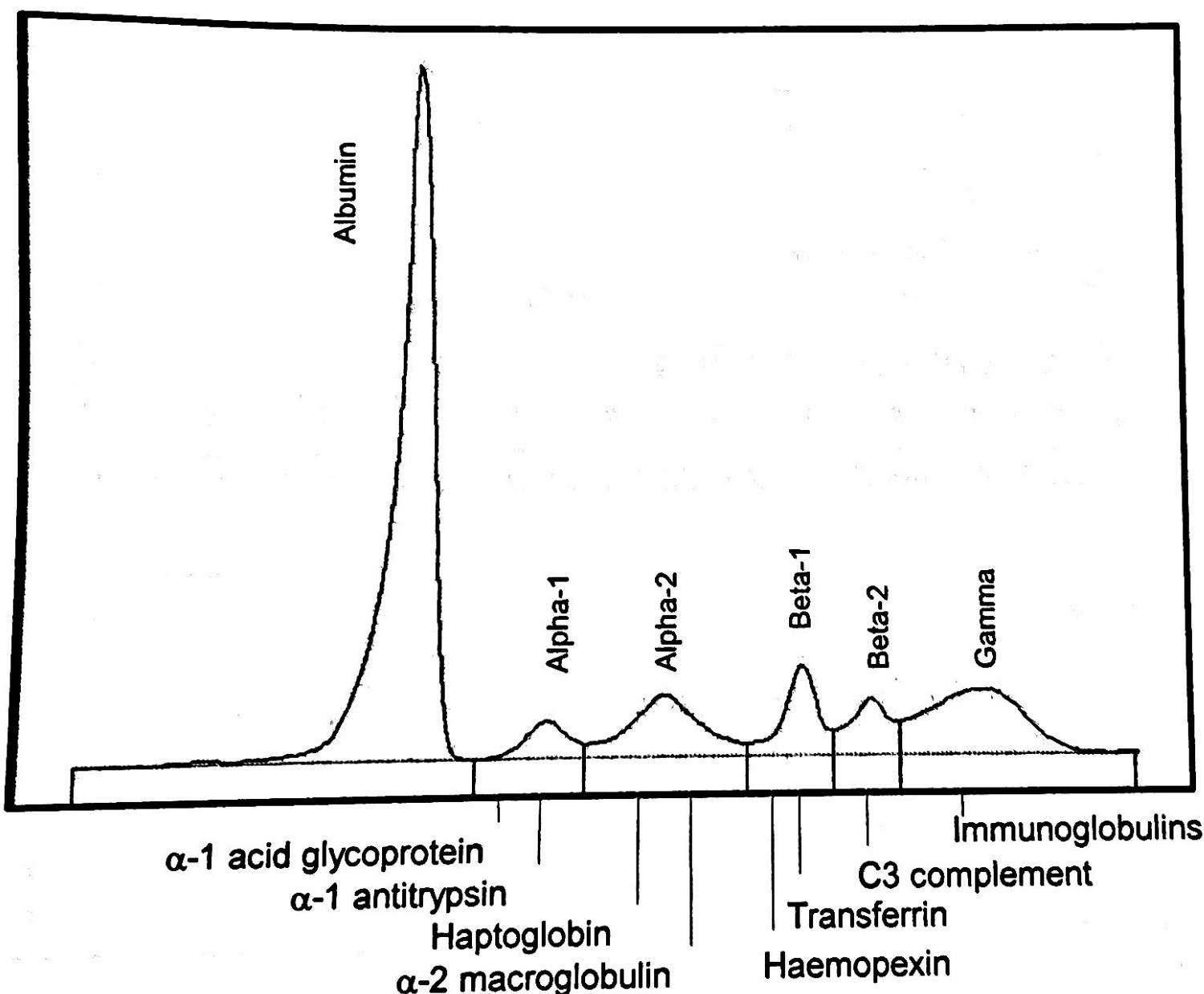


SERUM PROTEIN ELECTROPHORESIS

CHEMISTRY. SERUM BASED TESTS

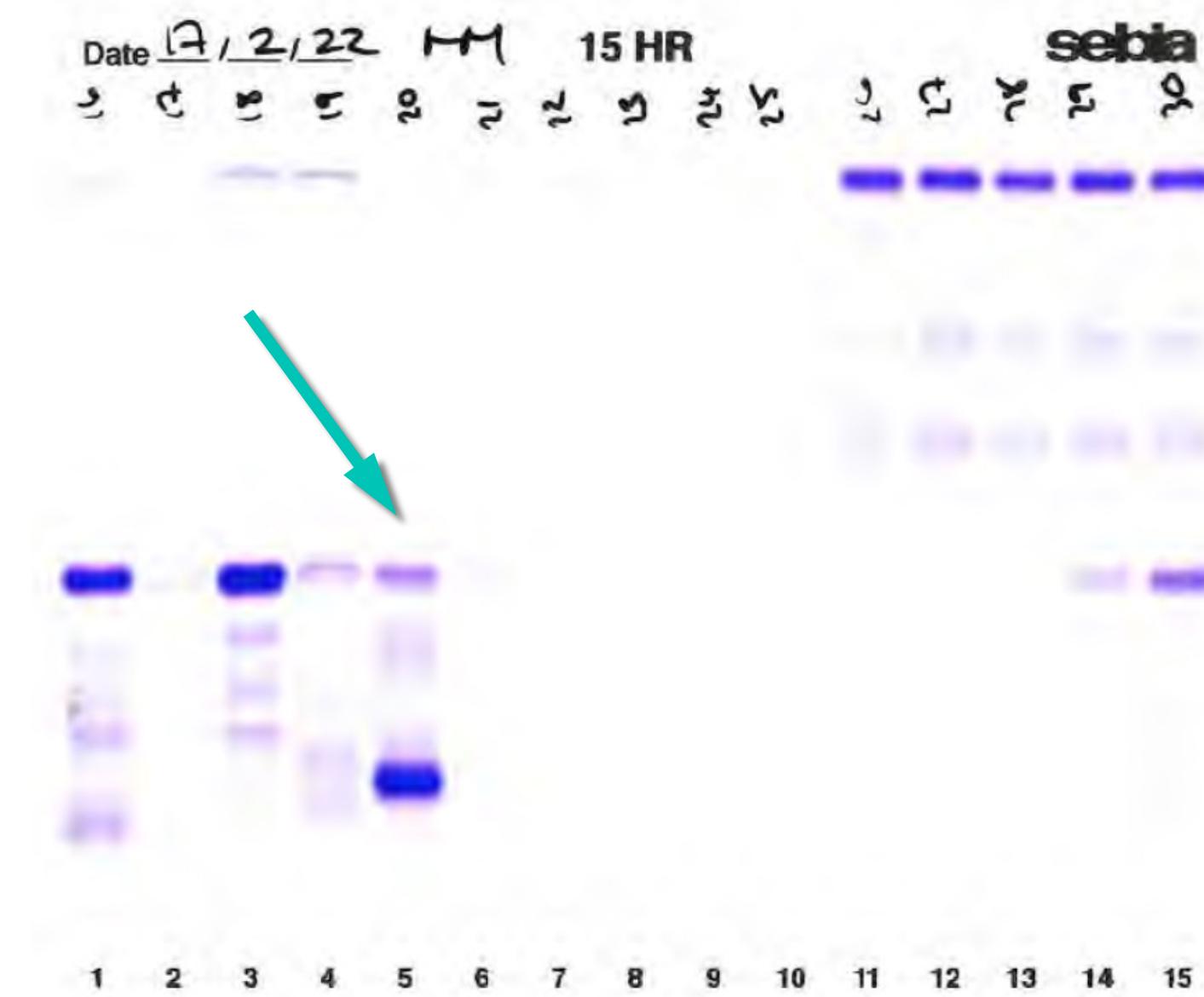
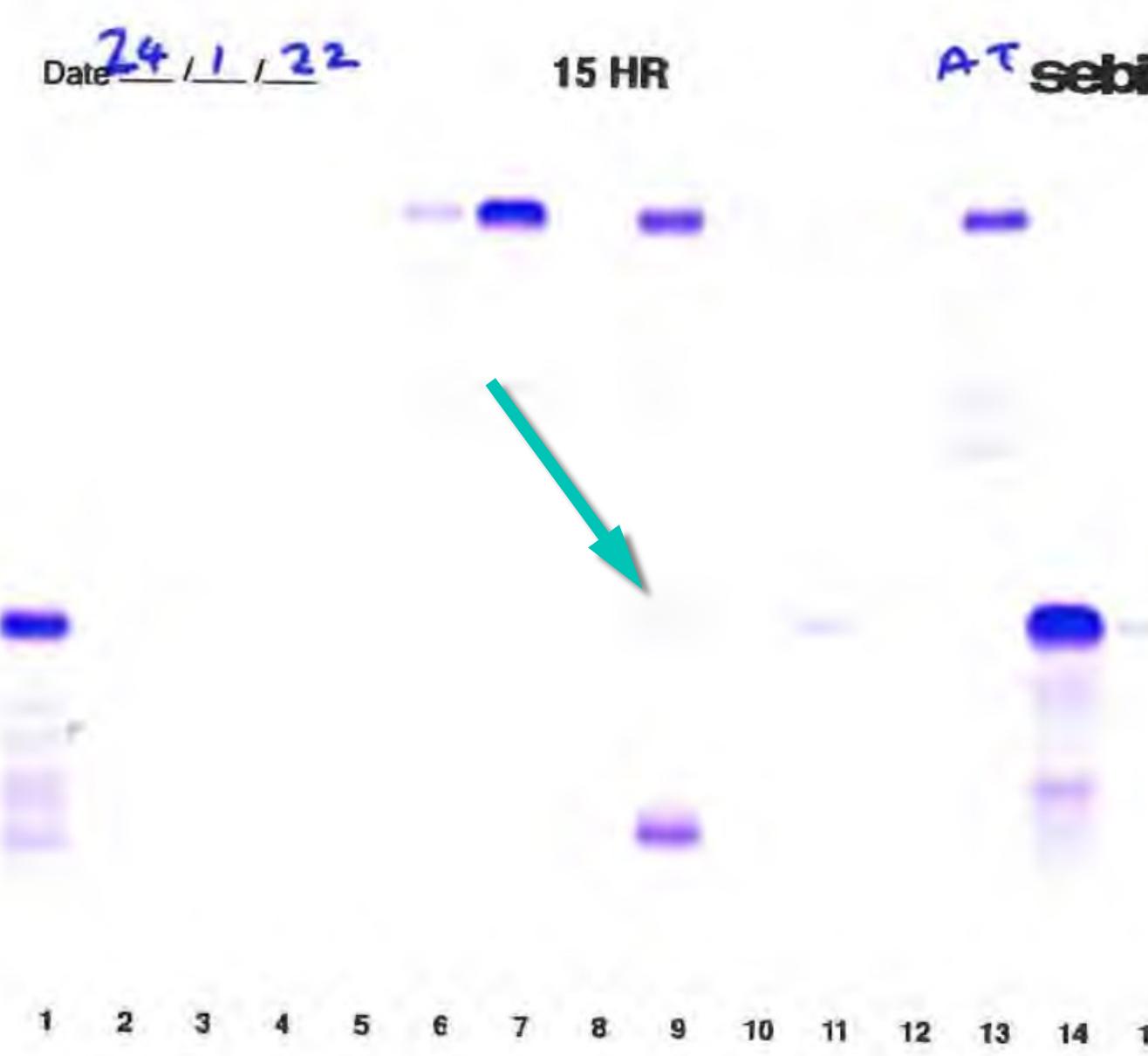
- A test that separates proteins based on their electrical charge and size, detecting the presence of paraprotein.
- Important to monitor myeloma

19-1-22



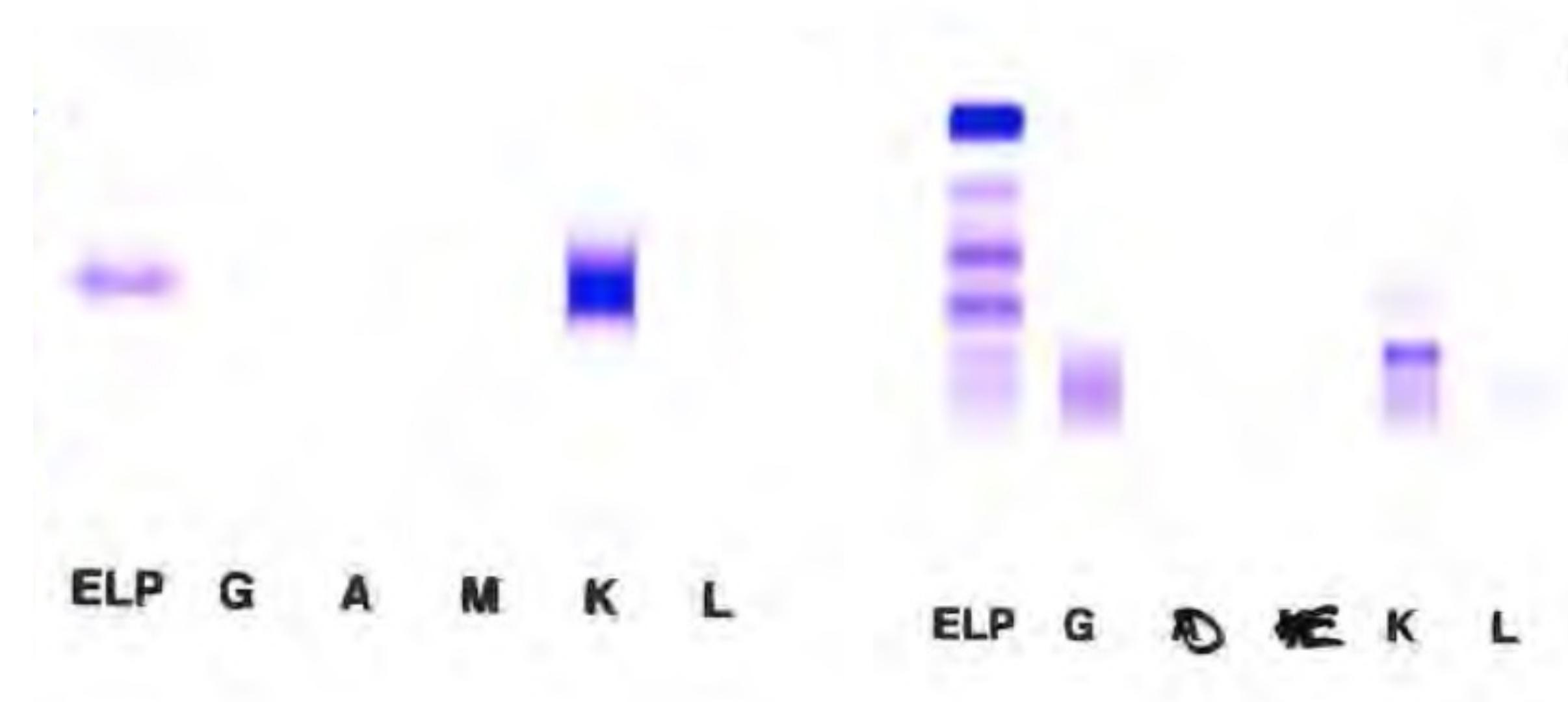
BENCE-JONES PROTEIN ASSAY CHEMISTRY. URINE BASED TESTS

- Free light chains are filtered through the nephron and secreted into the urine.
- Urine protein electrophoresis



IMMUNOFIXATION CHEMISTRY. URINE BASED TESTS

- Proteins are separated using a gel incubated with specific antisera
- Immunoglobulins bind with antiserum to form a complex seen in the gel after staining.



25-1-22

UREA AND ELECTROLYTE PROFILE CHEMISTRY. URINE BASED TESTS

- Check renal pathologic
 - Potassium
 - Sodium
 - Urea
 - Creatinine
 - eGFR

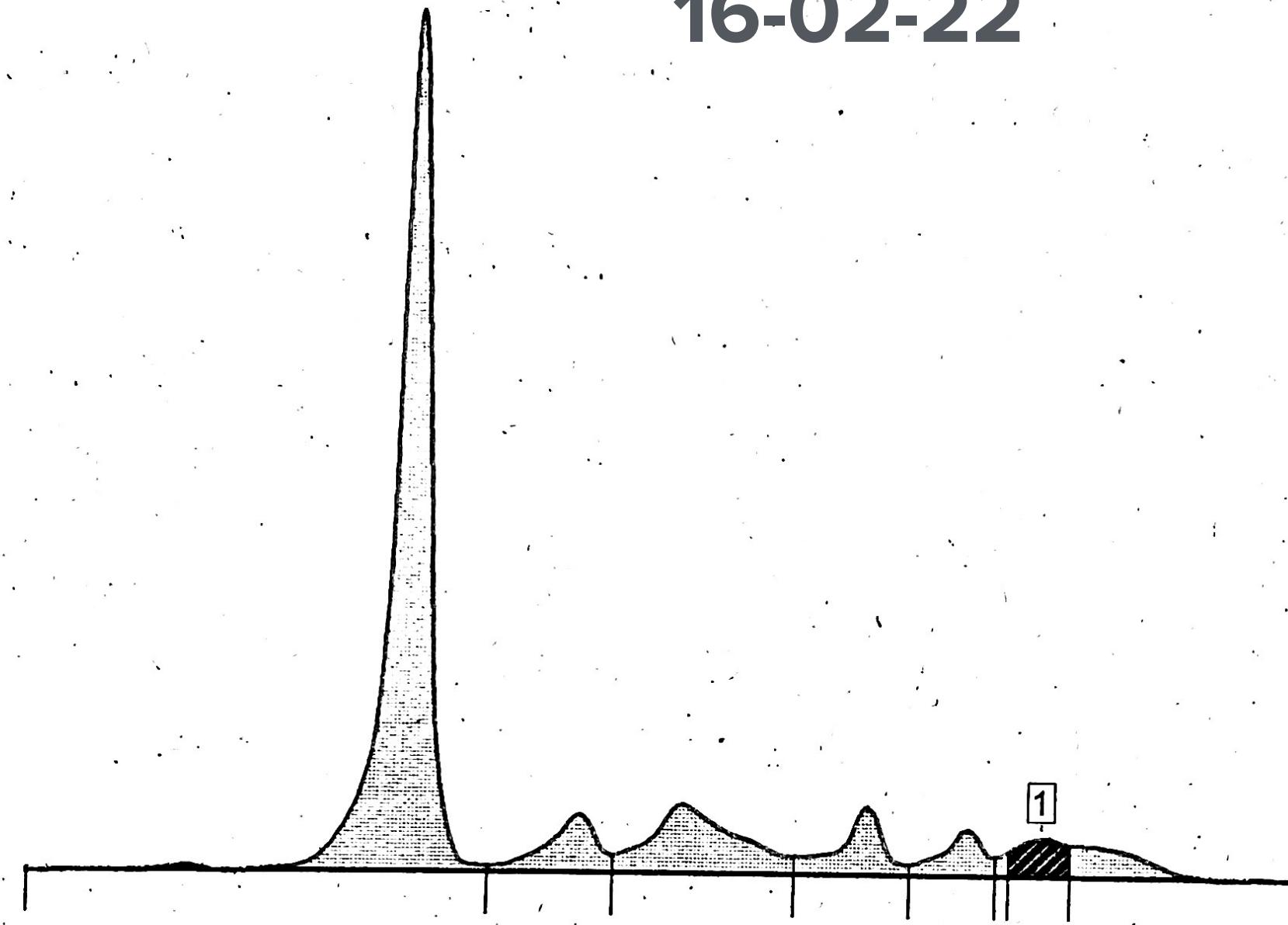
ELP G D E K L

18-2-22

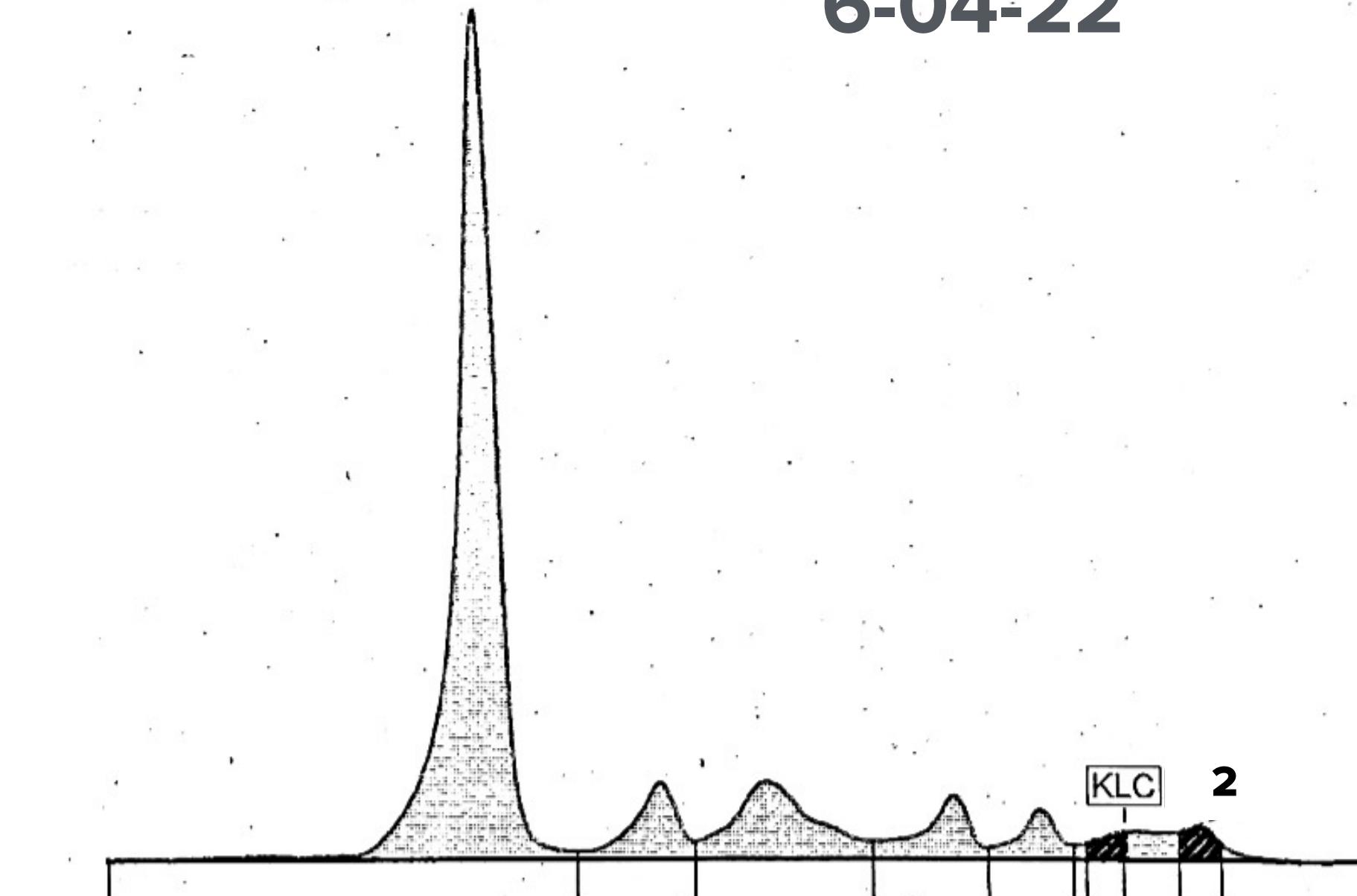
SERUM PROTEIN ELECTROPHORESIS CHEMISTRY. SERUM BASED TESTS

- After Bence-Jones, SEPH to confirm the presence of paraprotein in his blood.

16-02-22

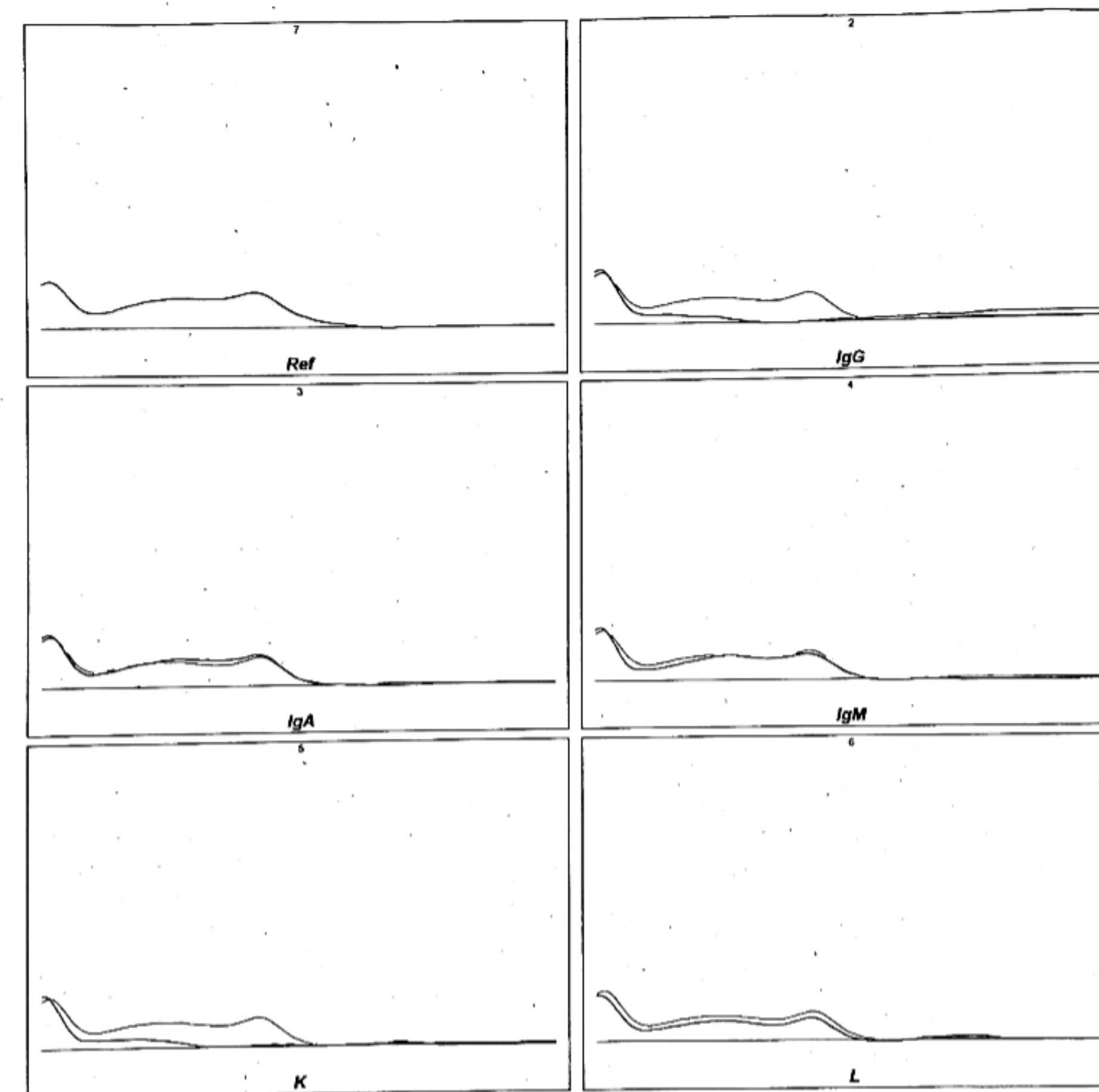
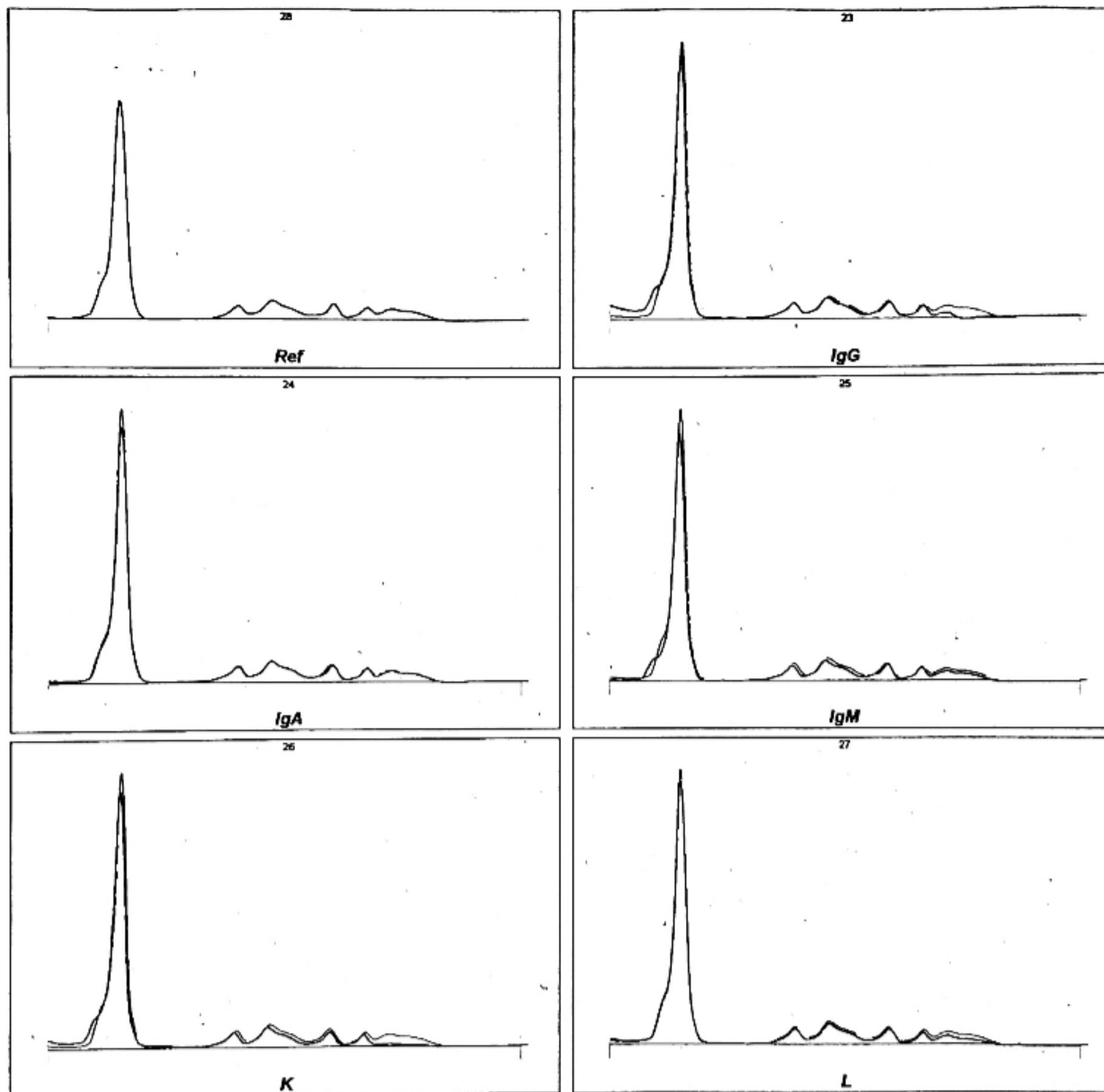


6-04-22



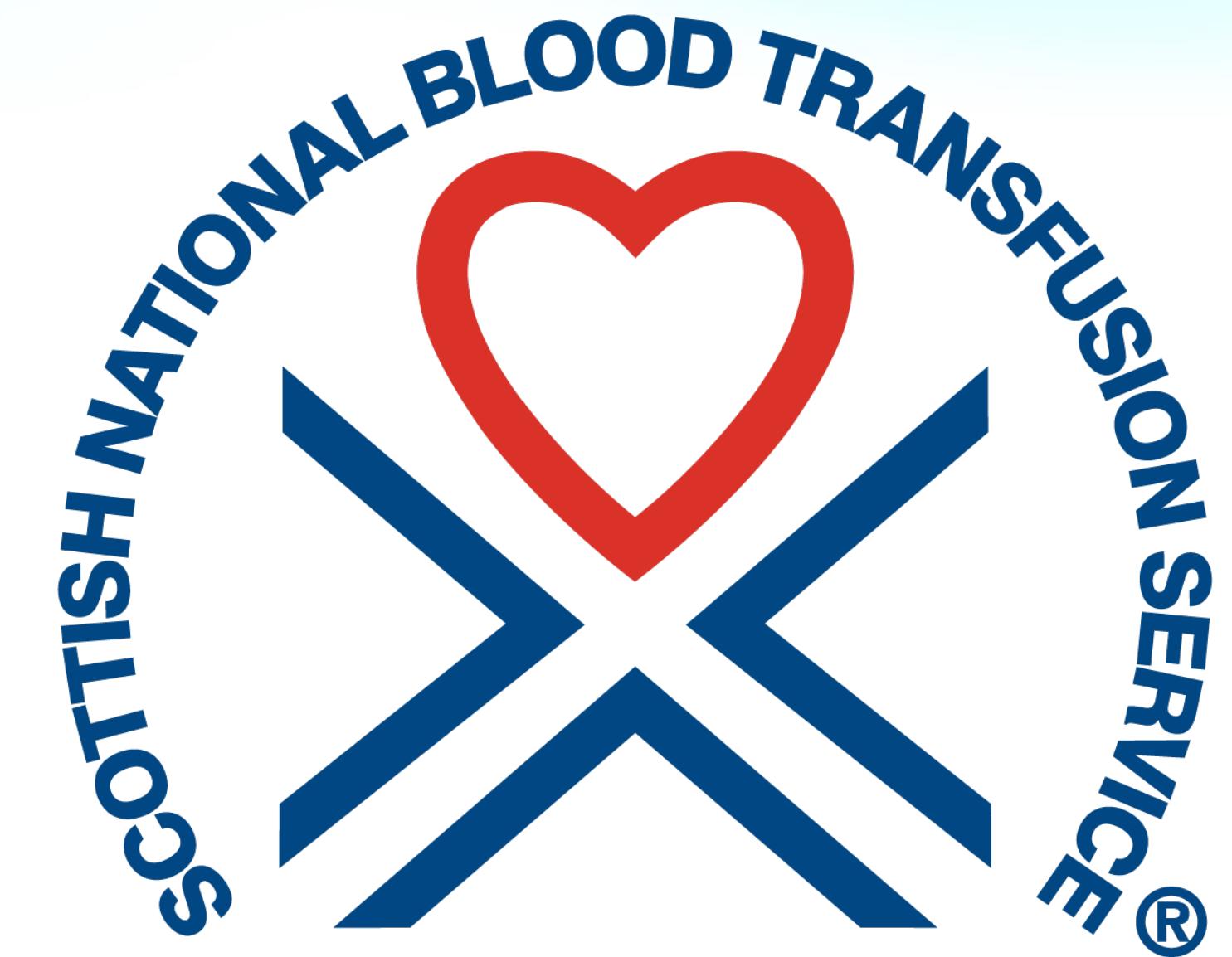
IMMUNOTYPING CHEMISTRY. SERUM BASED TESTS

- Quick and automatic procedure
- Capillary electrophoresis in free solution
 - Proteins react to their specific antiserum
 - It can be difficult to detect the type of band using immunotyping.



BLOOD BANK

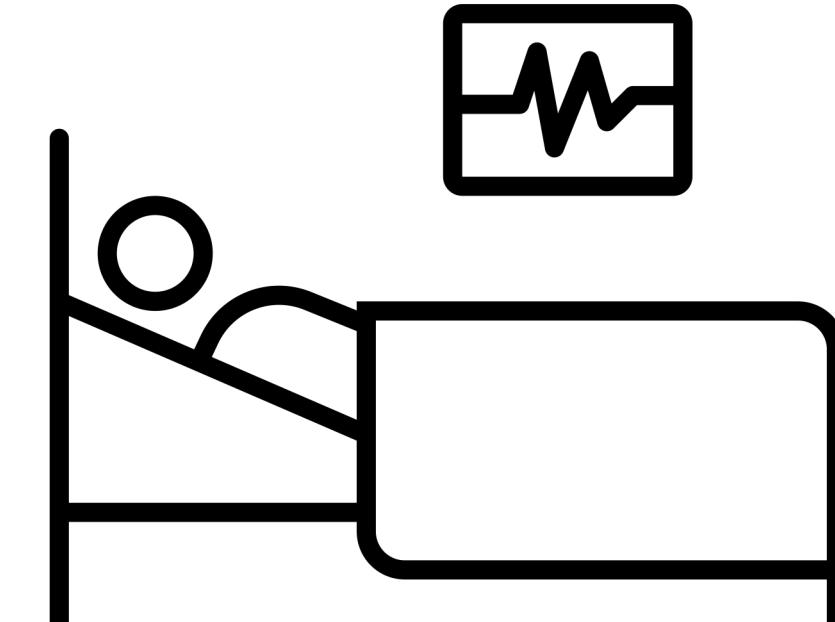
- Blood typing before starting chemotherapy due to daratumumab
 - ABO/Rh grouping, direct antiglobulin testing, antibody screening IAT, Kell Ag, antibody identification.
 - Sent to EBTS for a Rh Phenotyping (CEce typing)
 - A+, Fyb+, fya-, Jka+, M+, Jkb-, N+, S+, s+, K-, C+, E-, c-, e+ and Anti-IgG neg and Anti-C3d neg.



TREATMENT, MONITORING AND PROGNOSIS

TREATMENT

- Why is treatment important if myeloma cannot be cured?
- Relapses will always happen
- Transplant eligible or transplant ineligible?
- Our patient was young and fit so he was transplant eligible



March 2022
Start of treatment

**4 cycles of 28 days each of
DBTD chemotherapy:**

- Daratumumab
- Bortezomib
- Thalidomide
- Dexamethasone

U&E, calcium, and LDH
Serum Electrophoresis
FBC
Liver function
Uric acid and urea

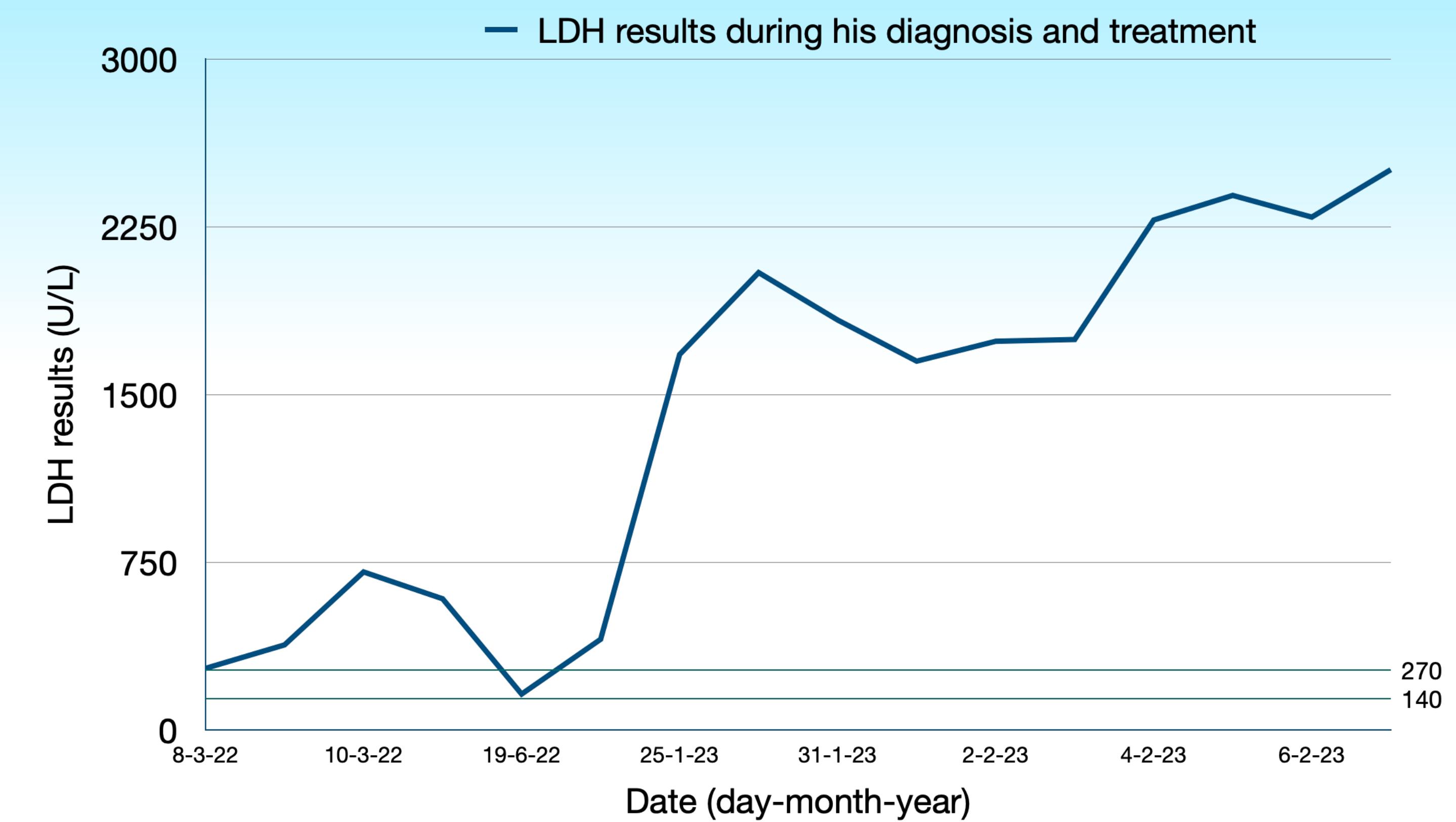
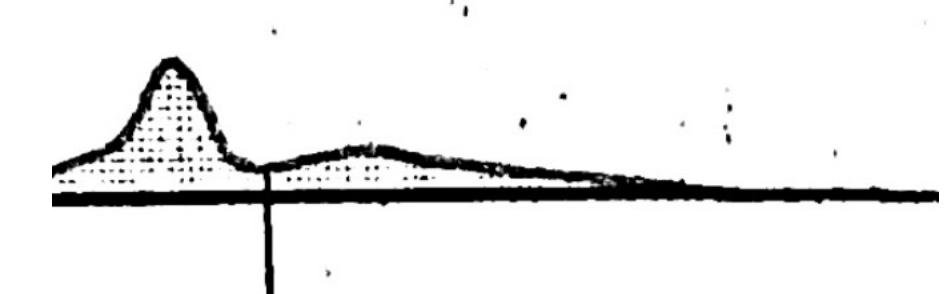
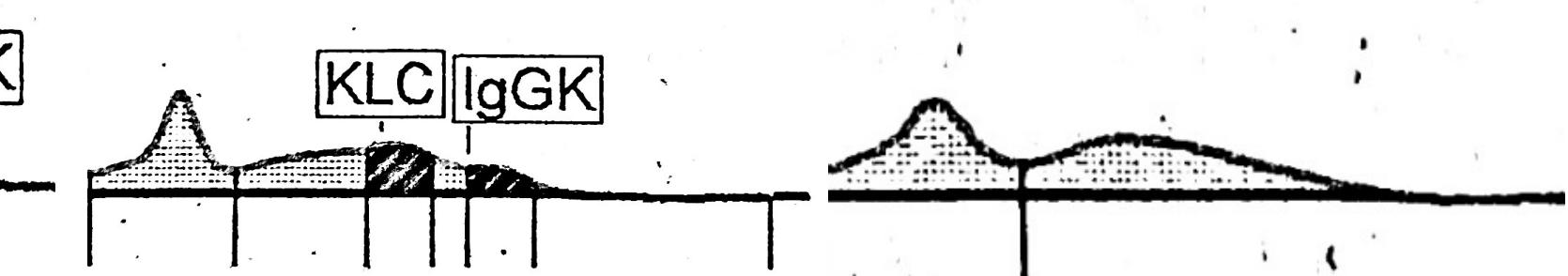
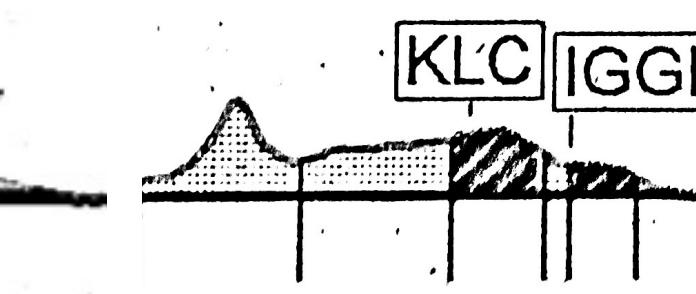
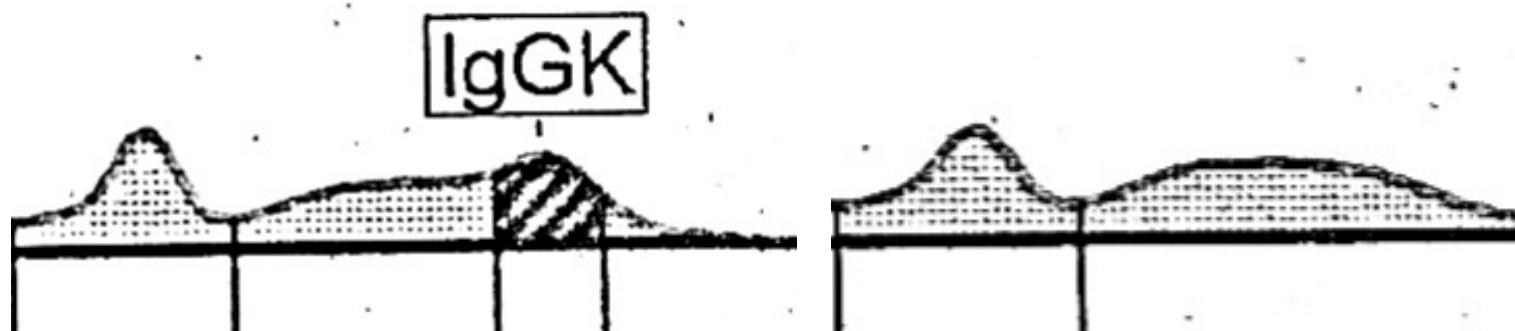
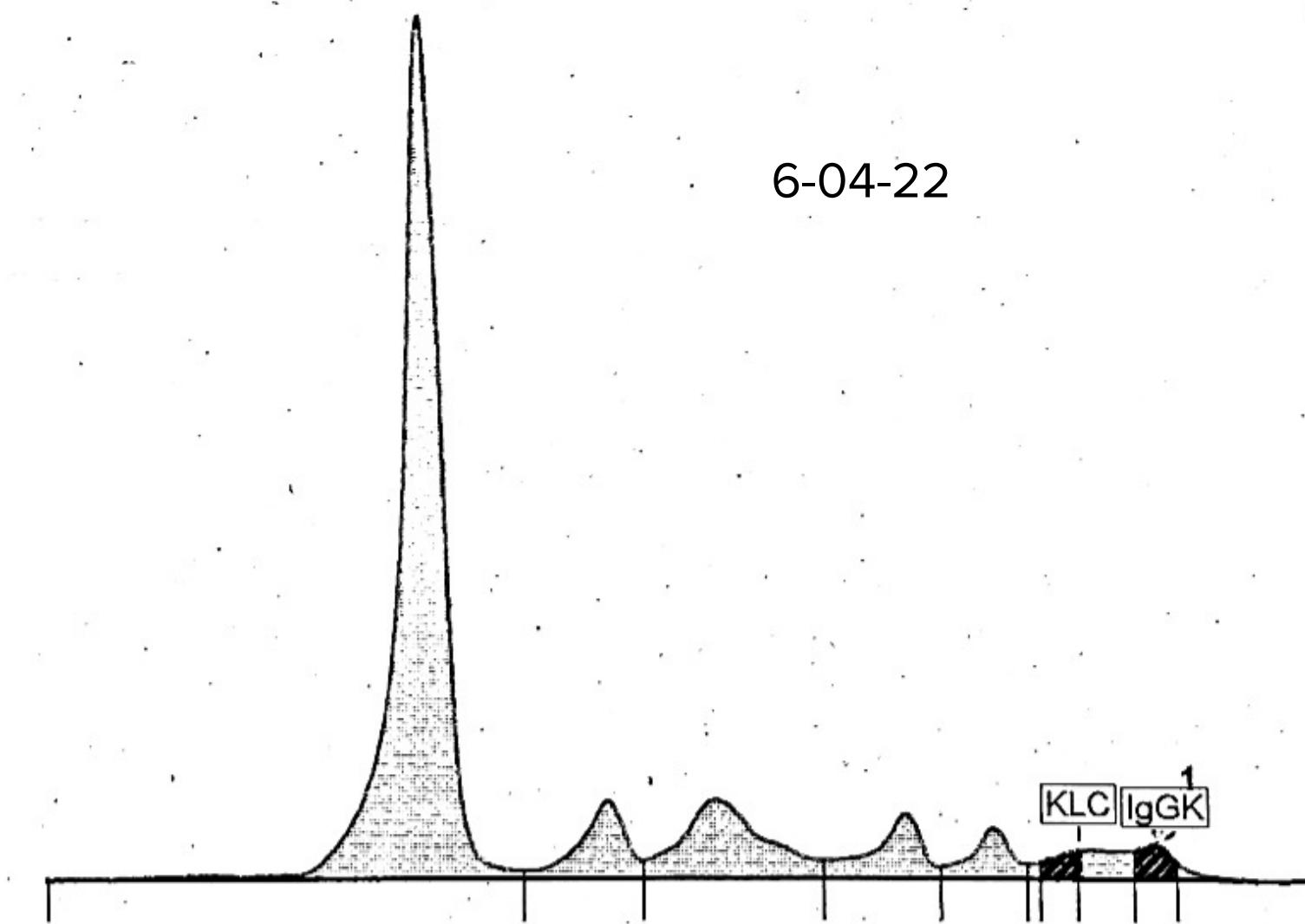
June 2022
End of chemotherapy

Monitoring

**Collection of own
stem cells**
**High dose of
melphalan**
**Looking forward for
the transplant**

MONITORING

Serum electrophoresis results



23-05-22

19-09-22

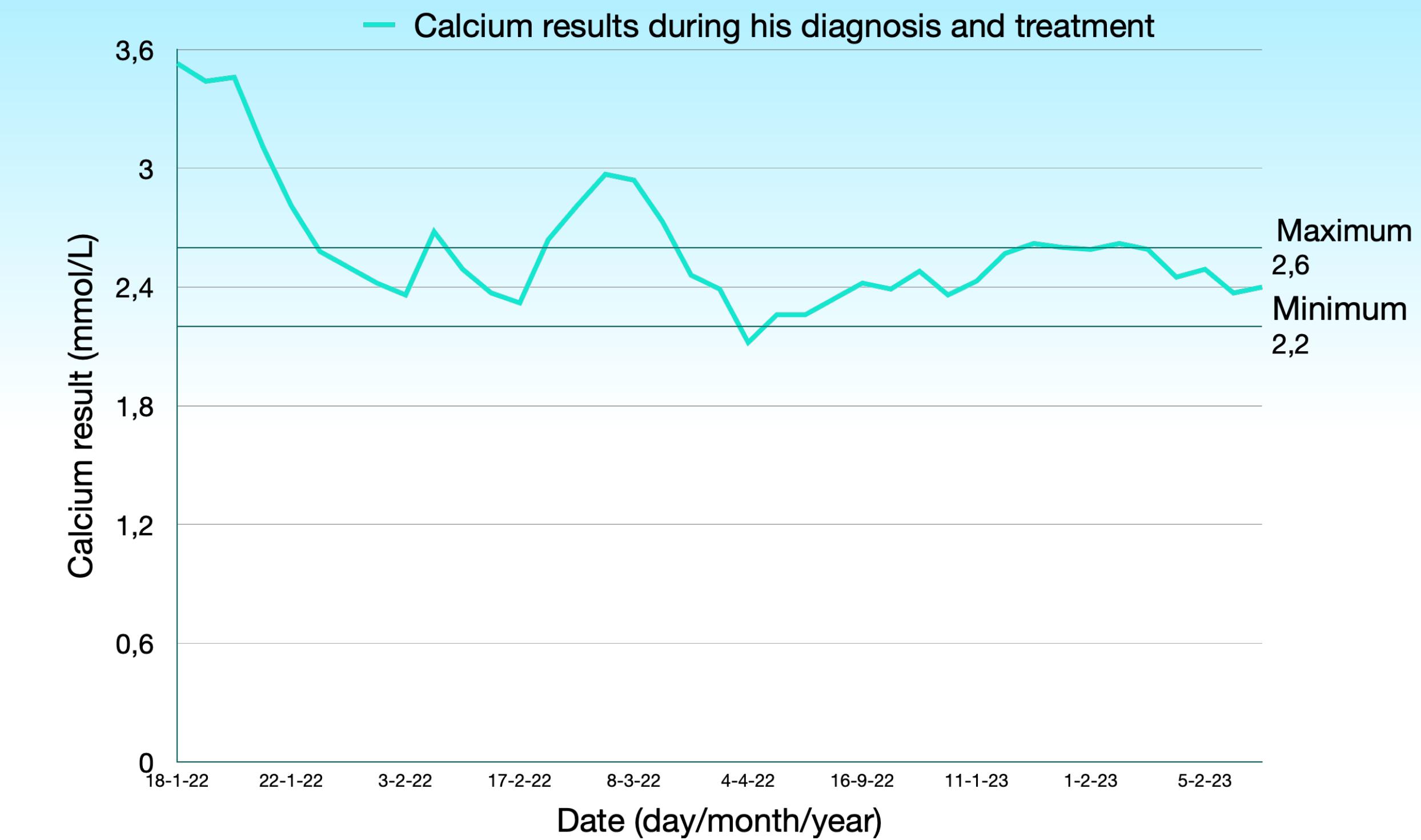
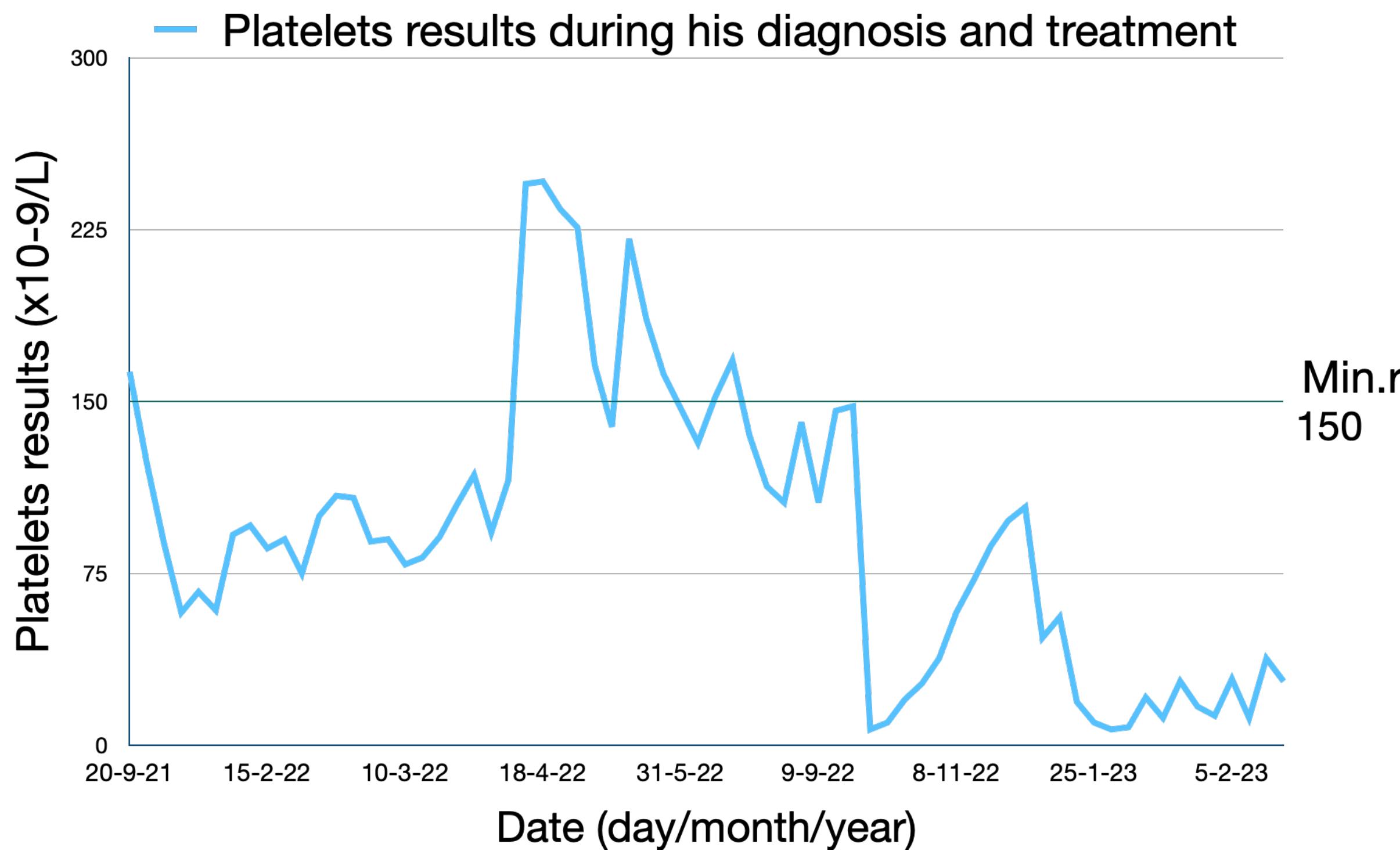
07-11-22

28-11-22

9-1-23

30-1-23

MONITORING



March 2022
Start of treatment

**4 cycles of 28 days each of
DBTD chemotherapy:**

- Daratumumab
- Bortezomib
- Thalidomide
- Dexamethasone

U&E, calcium, and LDH
Serum Electrophoresis

FBC

Liver function

Uric acid and urea

June 2022
End of chemotherapy

Monitoring

**Collection of own
stem cells**
**High dose of
melphalan**
**Looking forward for
the transplant**

October 2022
Transplant

2 further cycles of the
DBTD

Maintenance with
lenalidomide

Worsening cytopenias:
thrombocytopenia

Plasma cells found in FLM

Borderline hypercalcaemia

Bone marrow

Bone pains

Abnormal CNS involvement,
neurological symptoms

February 2023

January 2023
Relapse

Steroids and BD
Pyrexia

PROGNOSIS

No treatment



8 months average survival

Chemotherapy



3 years average survival

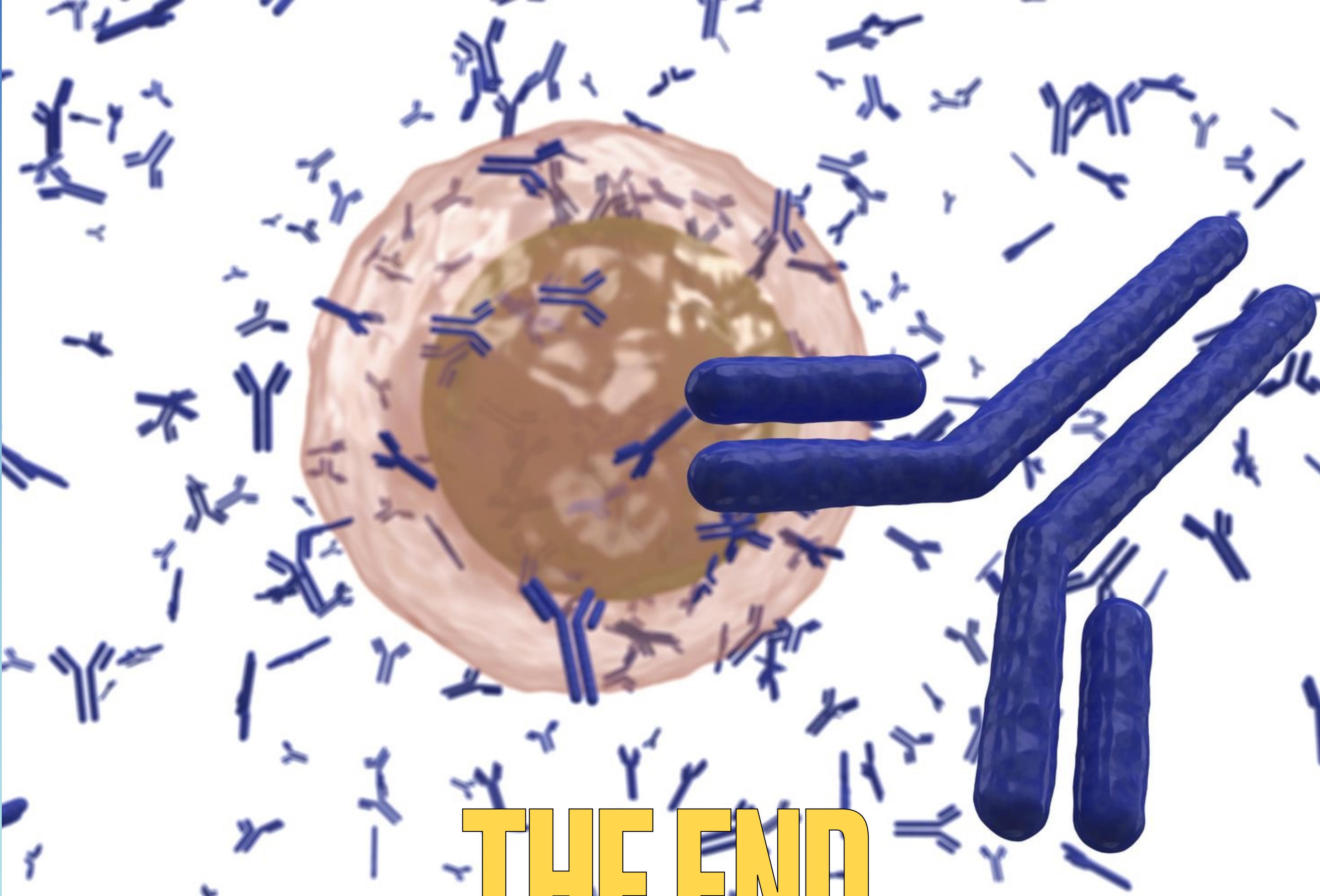
Chemotherapy + Stem Cell
transplant



5-6 years average survival

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THE END

Thank you for
listening!

Any
questions?