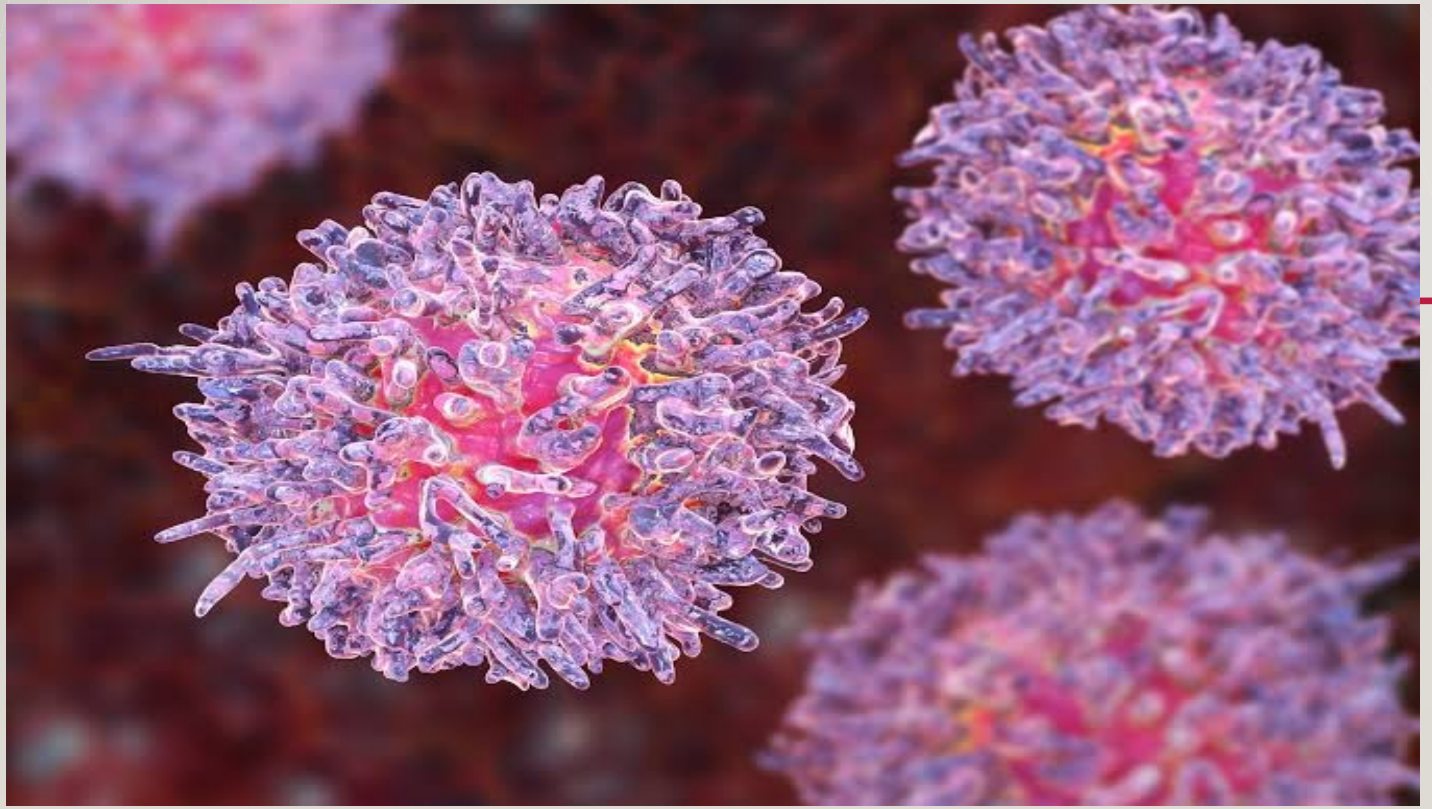
Clinical Scenario

Sarah, a 42-year-old woman, visits her doctor due to persistent exhaustion and recurring infections. During the examination, the doctor notices swollen lymph nodes in Sarah's neck and groin. Blood tests reveal low counts of red and white blood cells, along with platelets. Further investigation through a peripheral blood smear shows the presence of abnormal B lymphocytes with unique hairy projections.

HAIRY CELL LEUKEMIA



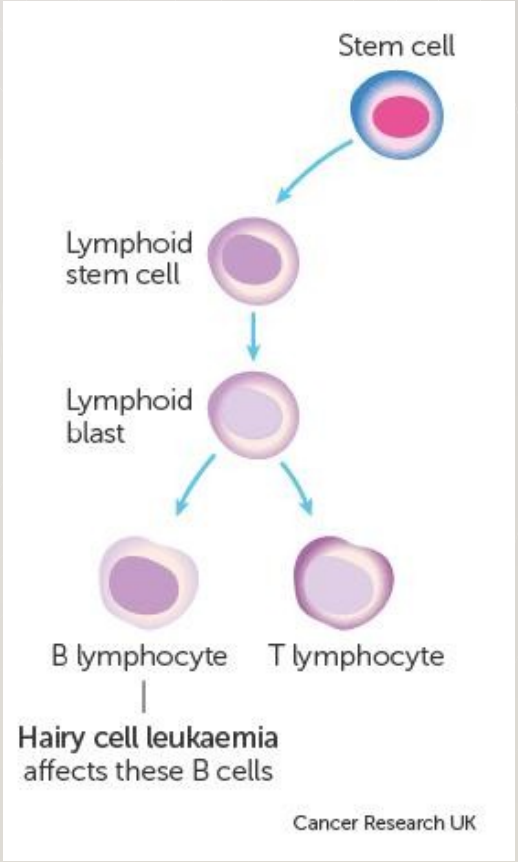
SOBIA HINA

DEFINITION AND INCIDENCE

HCL is an indolent B-cell neoplasm with distinct morphological and immunophenotypic features.

It is a rare leukemia, accounting for approximately 2% of all adult leukemias.

- Incidence is higher in older males.

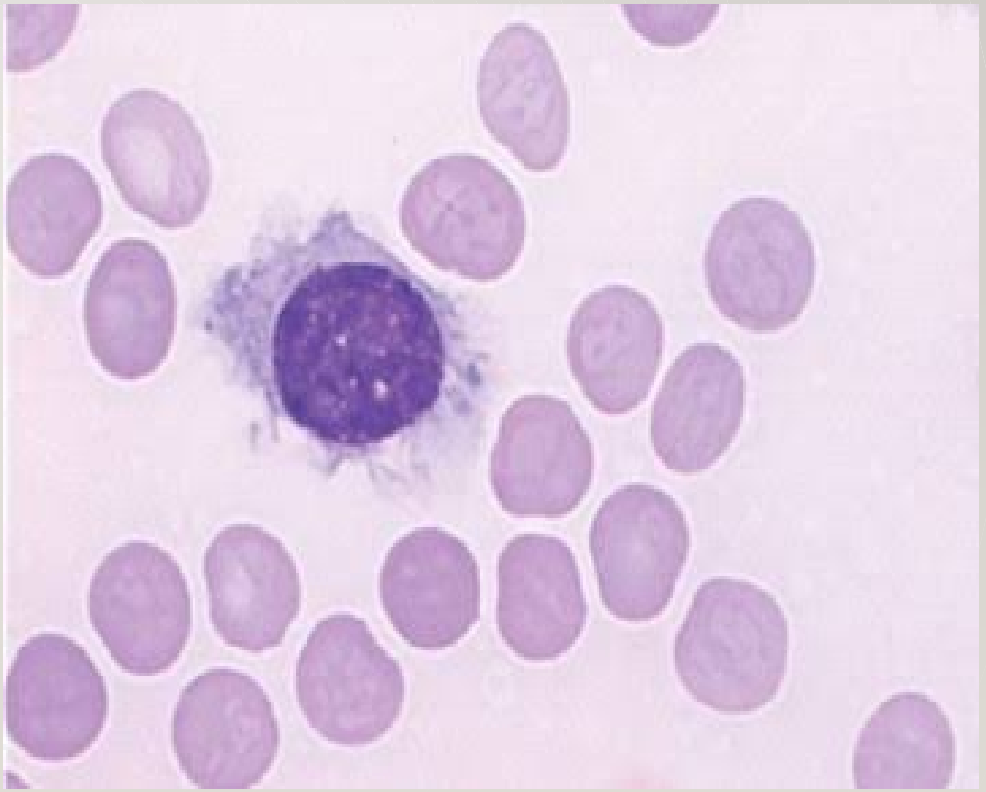


MORPHOLOGY OF HAIRY CELLS:

Distinctive morphology: Cells possess fine, cytoplasmic hair-like projections.

These projections are delicate and create a “fried-egg” appearance.

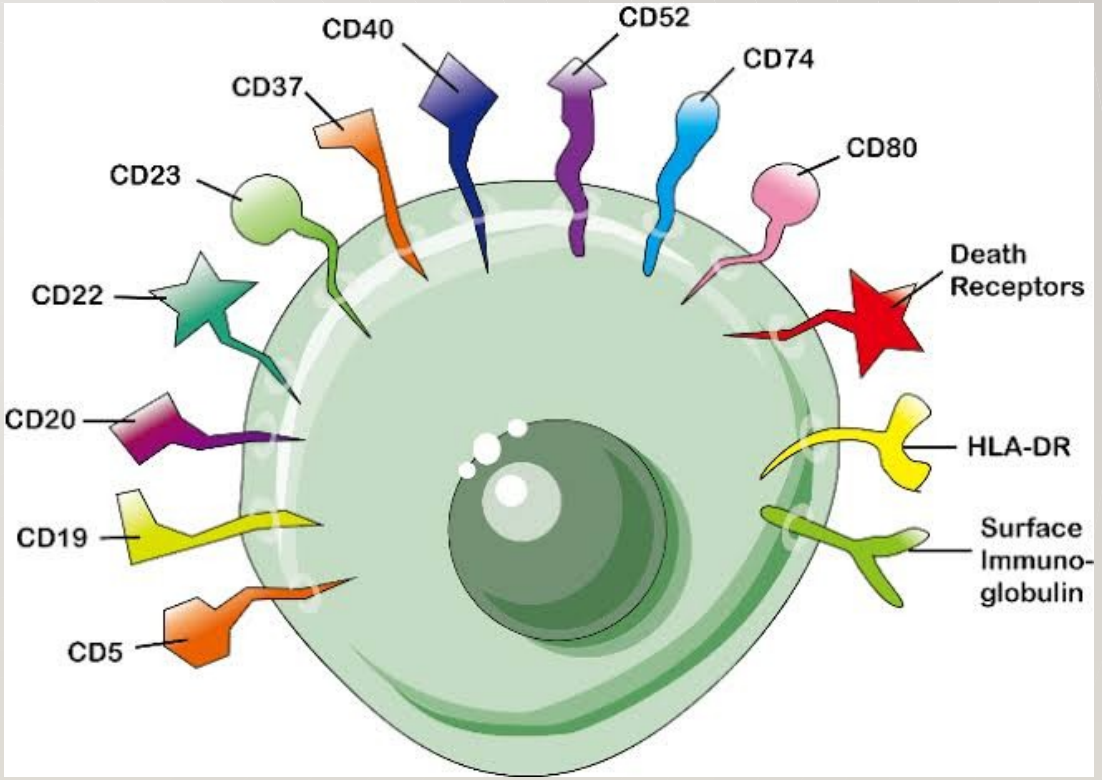
- Abundant pale cytoplasm surrounds the eccentrically located nucleus.



DIAGNOSTIC MARKERS

HCL cells express B-cell markers (CD20) and surface immunoglobulin.

- Additional diagnostic markers include CD11c and CD103, which are not commonly present in other B-cell tumors.

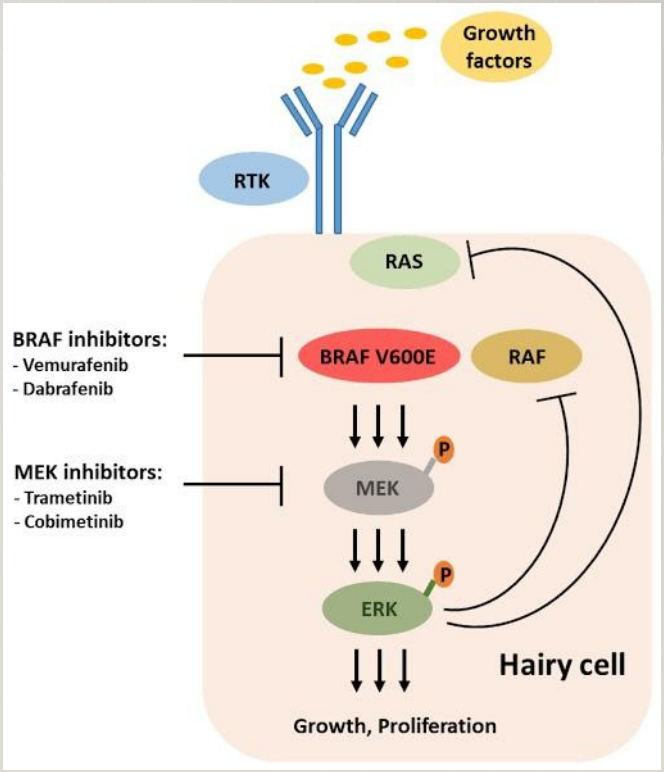


GENETIC ABNORMALITIES:

BRAF V600E mutation: Present in the majority of HCL cases (95%).

MAP2K1 (MEK1) mutations: Occur in a small subset of HCL cases (5%).

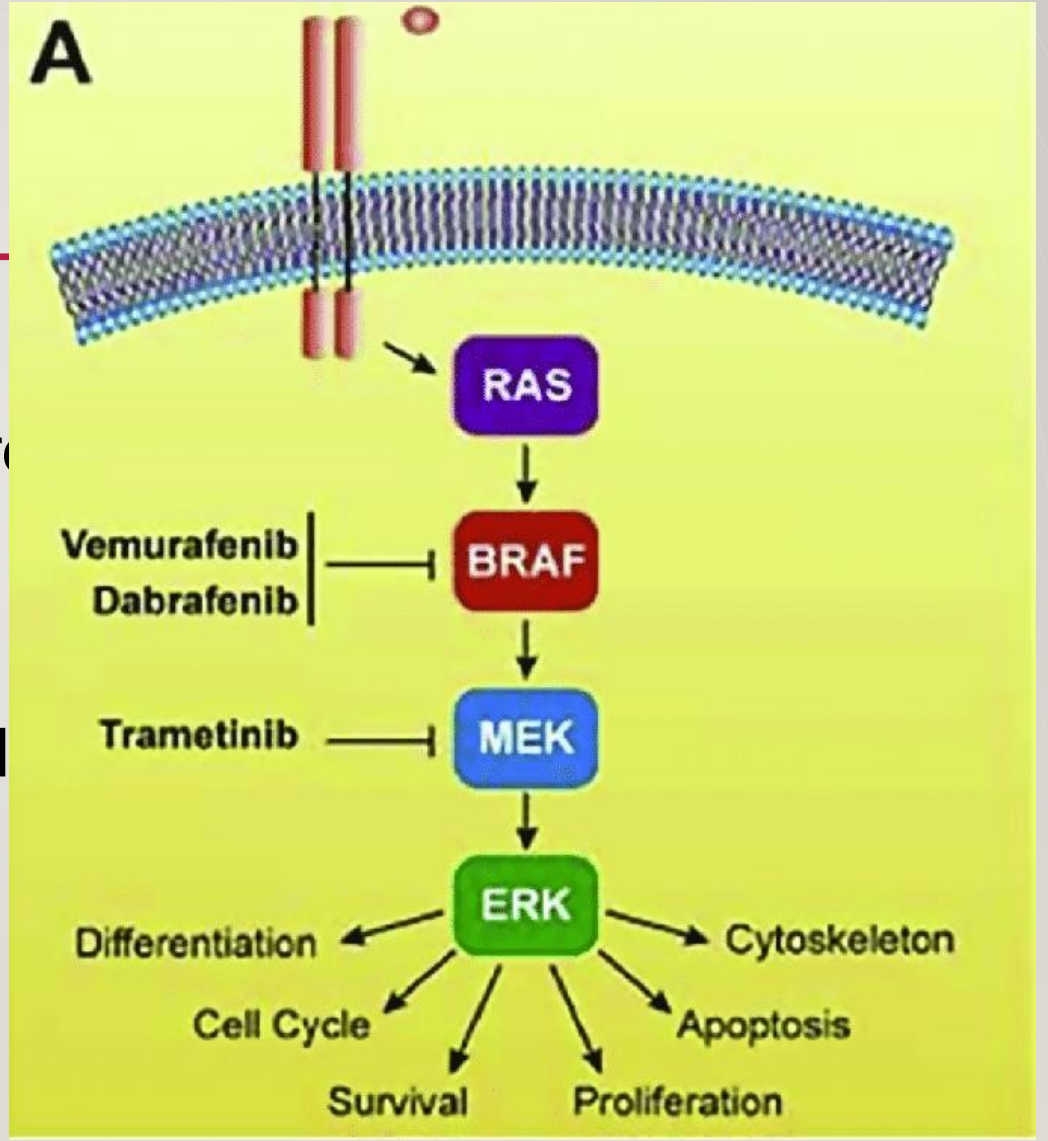
- These mutations play a crucial role in the pathogenesis of HCL.



PATHOGENESIS

Activating mutations in the serine/threonine kinase BRAF ar present in virtually all cases of HCL.

- BRAF mutations are also found in various other cancers.

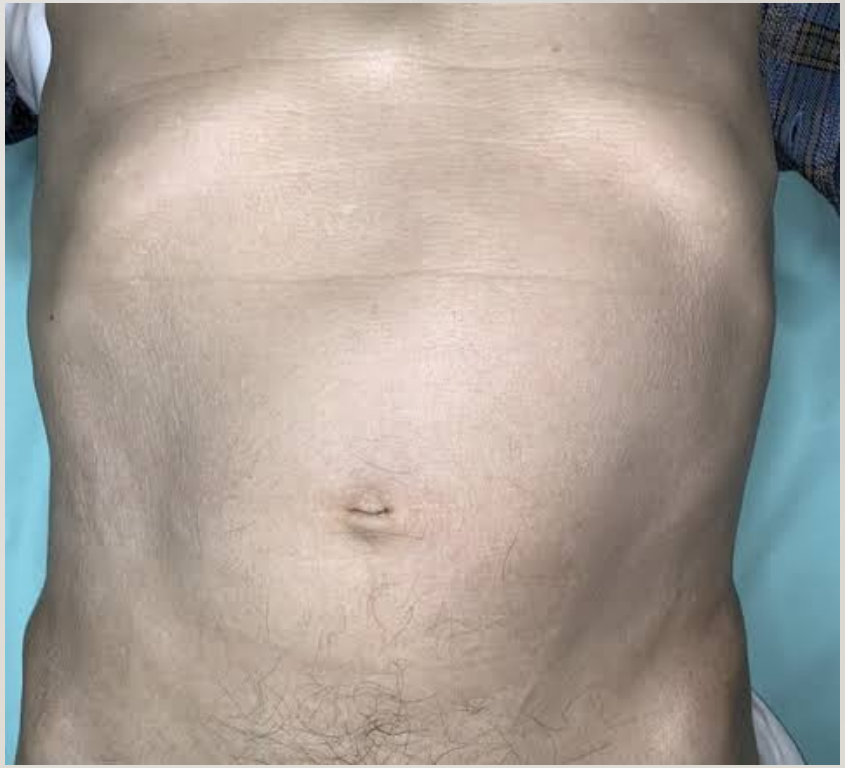


CLINICAL FEATURES

HCL manifests through bone marrow and spleen involvement.

Splenomegaly, often massive, is the most common physical finding.

- Lymph node involvement is rare

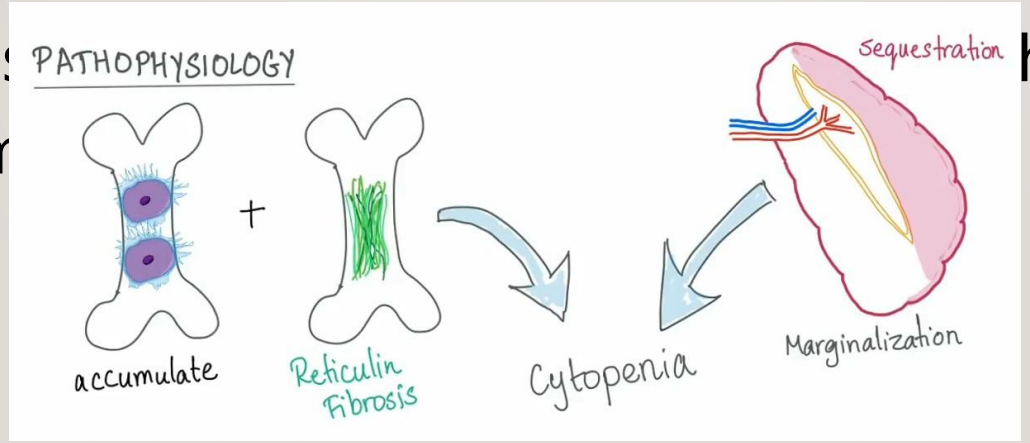


HEMATOLOGICAL ABNORMALITIES

Pancytopenia is seen in more than half of HCL cases due to marrow infiltration and splenic sequestration.

Leukocytosis is uncommon, found in only 15% to 20% of patients.

- “Hairy cells” on peripheral blood smear in m



CLINICAL PROGRESSION AND COMPLICATIONS

HCL is an indolent but progressive disease if left untreated.

Pancytopenia and infections are major clinical problems associated with HCL.

- Early diagnosis and treatment are essential to prevent complications.

TREATMENT OPTIONS

HCL is highly responsive to chemotherapeutic agents, particularly purine nucleosides.

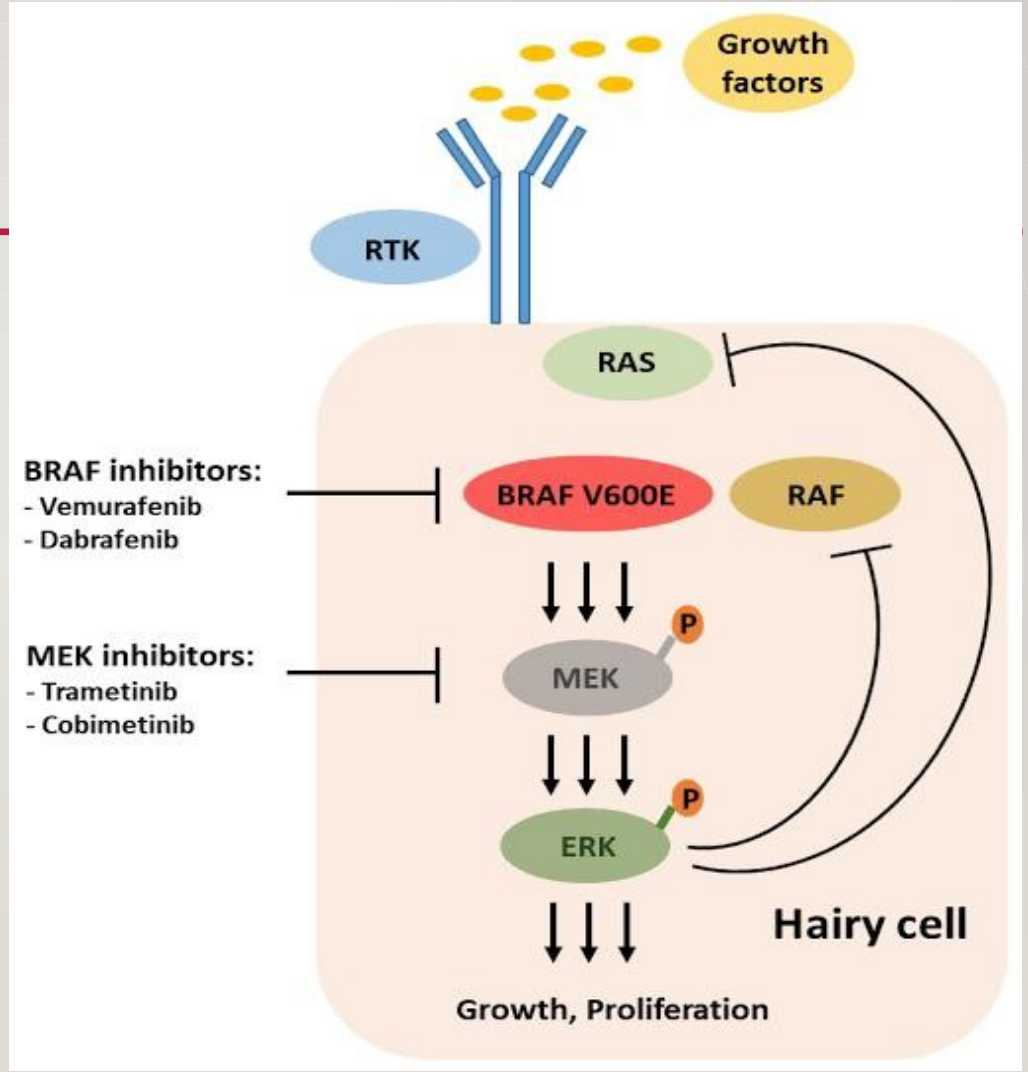
Complete durable responses are commonly achieved.

- Prognosis for HCL is excellent.

BRAF INHIBITORS

Tumors that fail conventional therapy show excellent responses to BRAF inhibitors.

- BRAF inhibitors may become the treatment of choice for resistant or relapsed HCL.

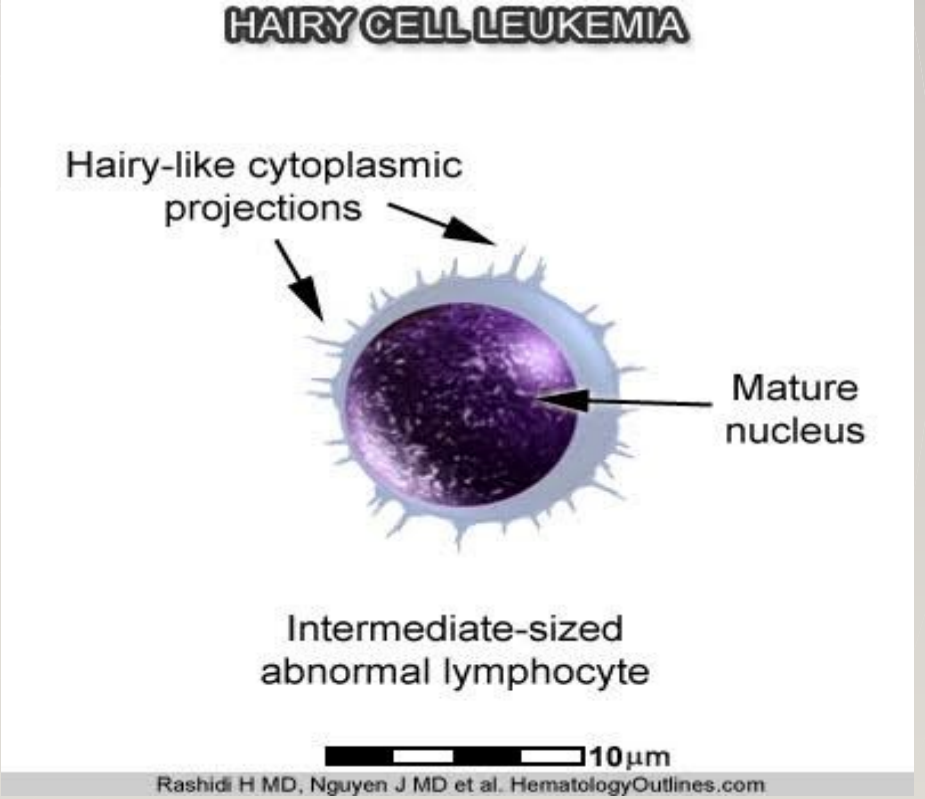


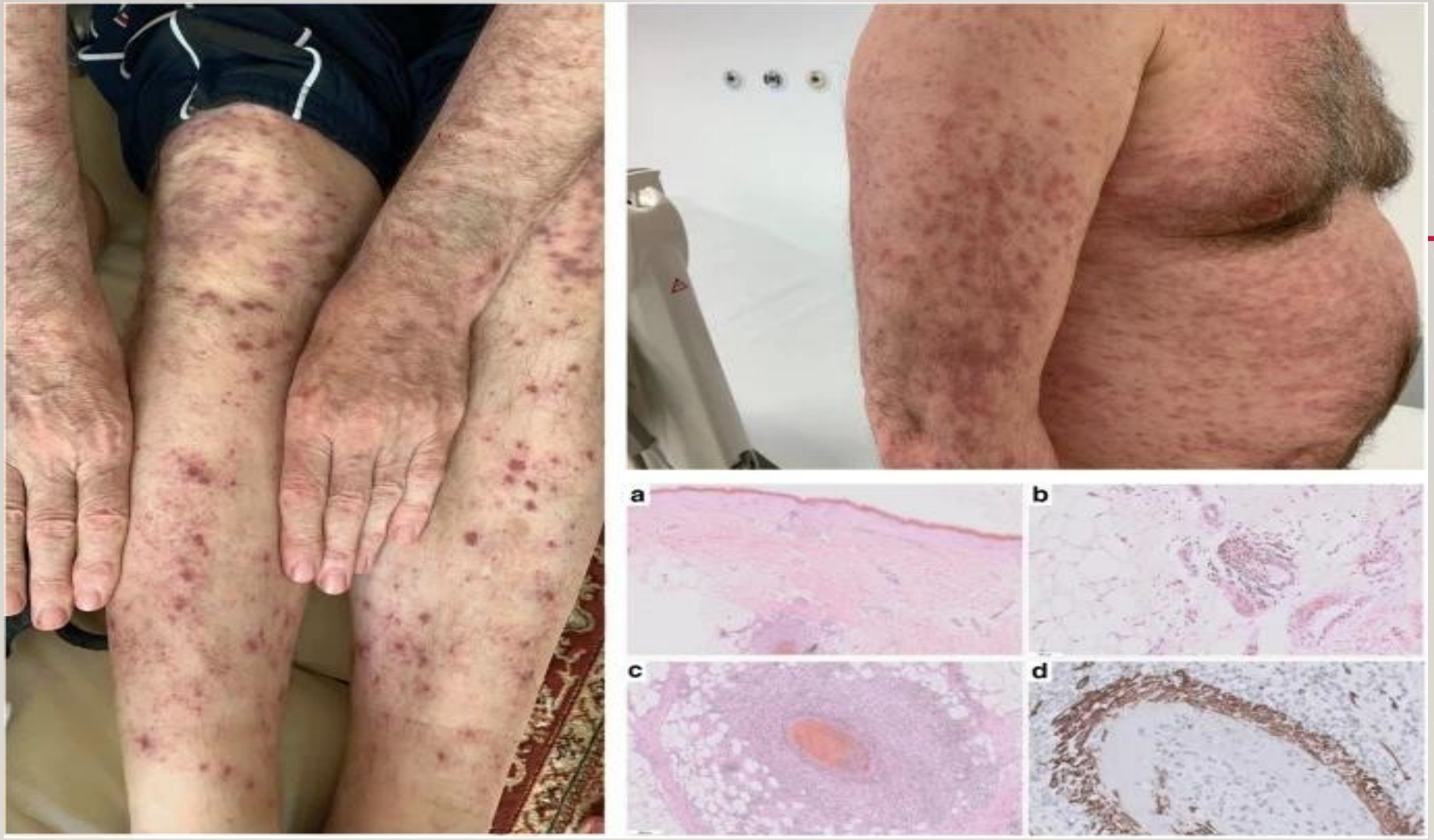
CONCLUSION

Hairy cell leukemia is characterized by bone marrow infiltration by cells with hairy projections.

HCL cells exhibit distinctive morphology, express specific immunophenotypic markers, and harbor genetic mutations.

- Differential diagnosis can be challenging, requiring careful evaluation and differentiation from similar entities

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Sarah, a 42-year-old woman, visits her doctor due to persistent exhaustion and recurring infections. During the examination, the doctor notices swollen lymph nodes in Sarah's neck and groin. Blood tests reveal low counts of red and white blood cells, along with platelets. Further investigation through a peripheral blood smear shows the presence of abnormal B lymphocytes with unique hairy projections. Sarah’s doctor develops a treatment plan to address her symptoms and improve her overall well-being.

THANK YOU!