

# A Rare Case of Spontaneous Tumor Lysis in Newly Diagnosed Chronic Lymphocytic Leukemia Unmasked by Acute Renal Failure: A Needle In The Haystack



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## Abstract

Tumor lysis syndrome (TLS) is the phenomenon of metabolic derangements that typically follows the initiation of cytotoxic chemotherapy. Metabolic disturbances include hyperphosphatemia, hyperkalemia, hyperuricemia and hypocalcemia. Hematological malignancies are associated with spontaneous TLS (STLS), which is cell lysis in the absence of chemotherapy. STLS is extremely rare in chronic lymphocytic leukemia (CLL). This has been documented only once in the medical literature, making this an extraordinarily uncommon case. We present here 68-year-old male with a history of benign prostatic hyperplasia (BPH) who is admitted for a 2-week history of abdominal pain and 3 days of anuria

## Case

- 68-year-old male with a history of benign prostatic hyperplasia (BPH) who is admitted for a 2-week history of abdominal pain and 3 days of anuria
- Elevated white blood cell count, lymphocytosis, and smudge cells (Table 1).
- Potassium, phosphorus, and uric acid were significantly increased.
- Treatment with aggressive fluid resuscitation, allopurinol and rasburicase.
- Flow cytometry confirmed markers: CD19+, CD20+, CD23+, CD5+, CD10-, confirming CLL dx
- Readmitted for similar episode within one month.
- Fluorescence in-situ hybridization (FISH) showed complex cytogenetics with unmutated IgVH.
- Indicated for Ibrutinib

## Data

Description	Day 1	Day 2	Readmission	Units	Reference Range
	Value	Value	Value		
Leukocyte Count	120.6	72.3	59.9	10 <sup>3</sup> /L	4.8-10.8
Hemoglobin	12.3	10.2	11.1	g/dL	13.5-17.0
Hematocrit	39.6	31.4	34.3	%	42-52
Mean Corpuscular Volume	92.5	91.4	91.6	fL	80.0-100.0
Platelets	284	15.4	195	10 <sup>3</sup> /uL	125-400
Neutrophils	23	25	7	%	36-66
Lymphocytes	73	88	89	16.0-43.5%	16.0-43.5
Monocytes	3	2	2		4.2-12.5
Sodium	122	127	130	mmol/L	136-145
Potassium	6.9	5.6	5.6	mmol/L	3.5-5.1
Chloride	84	88	97	mmol/L	98-107
Carbon Dioxide	12	14	16	mmol/L	21-32
Anion Gap	26	25	17	mmol/L	24-32
Glucose	146	142	107	mg/dL	65-99
Uric Acid	9.4	16.5	9.7	mmol/L	2.1-8.0
Calcium	8.5	7.7	8.8	μmol/L	62-106
Phosphorus	12.2	9.1	7.7	mg/dL	2.7-4.5
Blood Urea Nitrogen	202	186	111	mg/dL	10.0-20.0
Creatinine	14.1	12.9	5.8	mg/dL	0.7-1.3

Table 1. Laboratory values for day one and two of the patient's first admission.

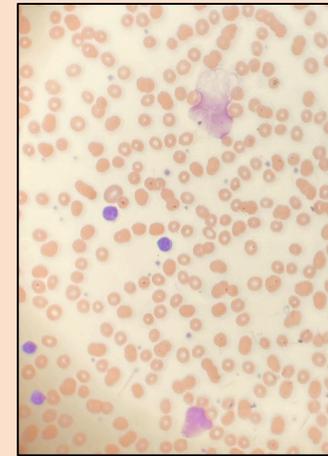


Figure 1: Smudge cells seen in peripheral blood smear of patient.

### Laboratory criteria

Uric acid	$x \geq 476 \mu\text{mol/l}$ or 25% increase from baseline
Potassium	$x \geq 6.0 \text{ mmol/l}$ or 25% increase from baseline
Phosphorus	$x \geq 2.1 \text{ mmol/l}$ (children), $x \geq 1.45 \text{ mmol/l}$ (adults) or 25% increase from baseline
Calcium	$x \leq 1.75 \text{ mmol/l}$ or 25% decrease from baseline

### Clinical criteria

- (1) Creatinine\*:  $x \geq 1.5 \text{ ULN}\dagger$  (age >12 years or age adjusted)
- (2) Cardiac arrhythmia/sudden death\*
- (3) Seizure\*

Table 2. The Cairo/Bishop diagnostic criteria for tumor lysis syndrome

## Discussion

- Tumor lysis syndrome (TLS) describes the phenomenon of metabolic derangements that occurs following the initiation of cytotoxic chemotherapy in cancer patients.
- The rapid lysis of cells releases electrolytes, proteins, and nucleic acids causing serious downstream effects like acute renal failure and seizures.
- Intrinsic tumor qualities that increase the risk of TLS include rapid proliferative rate of the cancer, bulky tumors defined as greater than 10 cm in diameter or a white blood cell count greater than 50,000, involvement of bone marrow or other organs, and high chemosensitivity.
- Pre-existing nephropathy, dehydration, oliguria, pretreatment hyperuricemia and/or hyperphosphatemia, and acidic urine all increase the probability of TLS.
- STLS has also been well-documented in hematological malignancies except CLL
- A case of STLS in proven CLL has only been documented once making this case extraordinary.

## Conclusion

- Initially, there was confusion regarding the mechanism of acute kidney injury in this patient.
- Anuria, abdominal distention, and a history of BPH led us to suspect an obstructive uropathy exacerbating or triggering TLS.
- Subsequent imaging revealed no evidence of hydronephrosis, thus undermining the BPH etiology of kidney injury, and supporting nephropathy secondary to TLS.
- Furthermore, this patient was readmitted for a similar presentation, supporting the thesis of kidney damage secondary to cell lysis.
- A second ever observation of this Spontaneous Tumor Lysis syndrome in CLL confirms the reality of it.