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Kevin J. Hess DO

*Lehigh Valley Health Network*, [Kevin.Hess@lvhn.org](mailto:Kevin.Hess@lvhn.org)

Joseph Moran DO

*Lehigh Valley Health Network*, [Joseph.Moran@lvhn.org](mailto:Joseph.Moran@lvhn.org)

Rachel Kinney DO

*Lehigh Valley Health Network*, [rachel.kinney@lvhn.org](mailto:rachel.kinney@lvhn.org)

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# Secretion of a Heparin-Like Anticoagulant (HLAC) in Plasma Cell Neoplasia

Kevin Hess, DO,<sup>1</sup> Joseph Moran, DO<sup>1</sup> and Rachel Kinney DO<sup>2</sup>

<sup>1</sup>Department of Medicine and <sup>2</sup>Division of Hematology/Oncology, Lehigh Valley Health Network, Allentown, Pennsylvania

## Introduction

- Multiple Myeloma is associated with bleeding disorders in approximately 15% of cases<sup>1</sup>
- The underlying physiologic mechanisms remain incompletely understood and create significant clinical challenges when approaching treatment
- The development of a heparin-like anticoagulant (HLAC) in plasma cell neoplasia has been described in literature and may be a mechanism of action to which bleeding occurs in patients with MM<sup>2</sup>
- Infusions of protamine sulfate have been proposed as a potential therapy in this clinical setting<sup>2</sup>

## Case Presentation

- A 62 year-old male with a past medical history of Monoclonal Gammopathy of Undetermined Significance and basal cell carcinoma presented to the ED with complaints of non-radiating epigastric abdominal pain for one week
- On admission he was found to have hypercalcemia, renal failure, and pancytopenia. Hematological work up revealed significantly elevated kappa light chains consistent with myeloma and a bone marrow biopsy revealing circulating plasma cells
- His mental status did not improve over a 15-day hospital course he was transferred to our facility. On presentation the patient was not oriented to person place or time, was writhing, moaning and completely non verbal

- Labs showed prolonged partial thromboplastin time (PTT) and thrombin time. Transfusions of platelets, blood and fresh frozen plasma were unable to control the bleeding
- After literature review, the patient was started on protamine sulfate infusion resulting in significant improvement in his bleeding. The patient's hospital course was complicated by acute liver failure and worsening renal failure and was transitioned to comfort measures only

## Significant Laboratory Values

	Pre-Protamine Infusion	On Protamine	Off Protamine
<b>Hemoglobin</b>	5.9	8.5	7.7
<b>Platelets</b>	17.0	39.0	16.0
<b>aPTT</b>	42.4	32.5	52.6
<b>PT</b>	14.7	16.6	17.2
<b>INR</b>	1.2	1.4	1.5
<b>Factor VIII</b>	773%	(not repeated)	(not repeated)
<b>Von Willebrand Factor Activity</b>	>440%	(not repeated)	(not repeated)
<b>Von Willbrand Factor Antigen</b>	>600%	(not repeated)	(not repeated)

## Discussion

- Secretion of HLAC in Plasma Cell Neoplasia has been described in case reports but affirmative research on the topic remains sparse
- Literature suggests that HLAC may be paraproteins produced within myeloma while other studies have suggested these proteins that are similar to heparin sulfate may be responsible by binding antithrombin and leading to activation of the heparin binding site<sup>2,3,4</sup>
- Regardless of the mechanism, prior cases have demonstrated that administration of 10, 50, 100, and 200 mg/mL of protamine sulfate in patients with myeloma improved thrombin time from >600 seconds to 187 seconds, 76 seconds, 22 seconds, and 21 seconds respectively<sup>3</sup>
- In the present case, once the patient was started on protamine sulfate, his bleeding significantly improved and his PTT normalized. Once off the infusion, his PTT and thrombin time both became elevated again

## References

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