Plasminogen Deficiency, Type 1: For Nephrology/Urology

Overview of Plasminogen Deficiency (PLGD)

- PLGD Type 1: a quantitative protein deficiency, with decreased plasminogen activity and decreased antigen
  - Due to a genetic mutation in the gene for plasminogen; > 50 different mutations have been identified; Autosomal Recessive inheritance
  - Most common presenting symptom is ligneous conjunctivitis, but multi-organ, systemic disease that can be life-threatening
- PLGD Type 2: reduced functional activity of plasminogen, but normal antigen levels; patients are asymptomatic

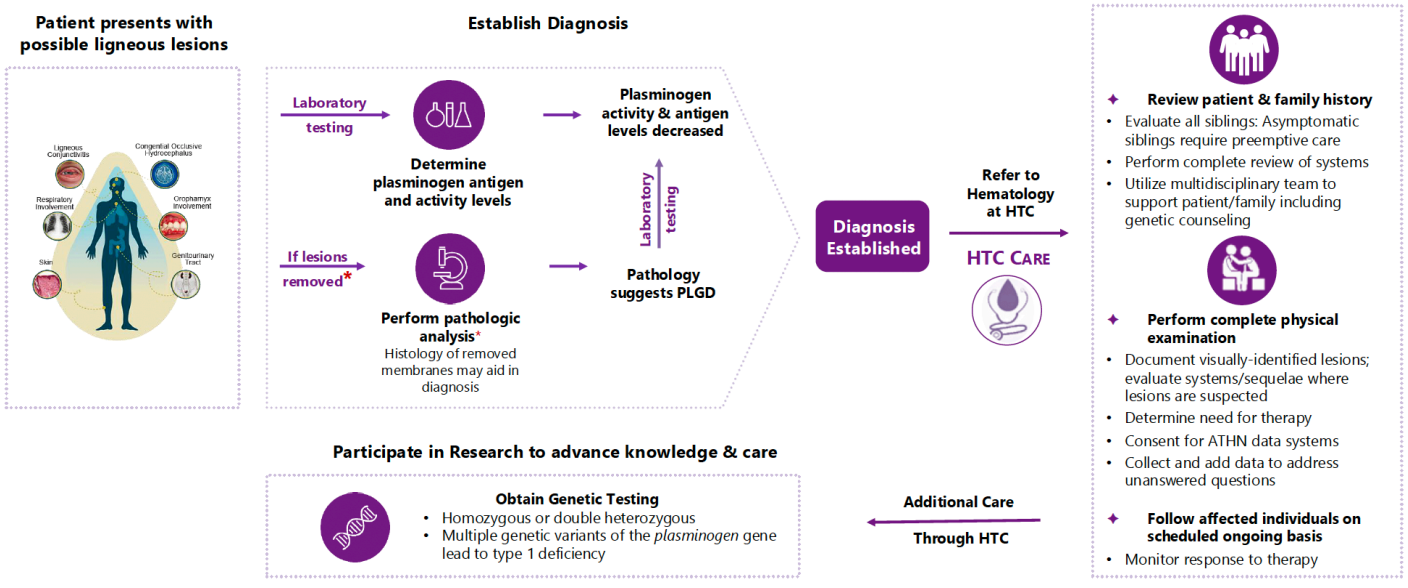
	Normal	PLGD Type 1	PLGD Type 2
Plasminogen Activity	70-130%	Decreased	Decreased
Plasminogen Antigen	6-25 mg/dL	Decreased	Normal
For Patients: My Plasminogen Activity			

Diagnosis

- Complicated by heterogeneous symptoms; symptoms can wax and wane
- Mucosal surfaces of the eyes, ears, nose, gums, airways, lungs, GI tract, kidneys, GU tract, CNS, and skin can all be affected
- Initial point of medical contact therefore includes many disciplines

Treatment

- Ryplazim (plasminogen, human-tvmh) given by IV infusion leads to resolution of lesions
- Surgical removal of lesions, though initially helpful, leads to accelerated regrowth
- Referral to a Hemophilia Treatment Center (HTC) to serve as medical home, and:
  - Educate on product use
  - Ongoing symptom monitoring, outcomes, safety
  - Administer doses, determine dosing schedule
  - Teach home infusion



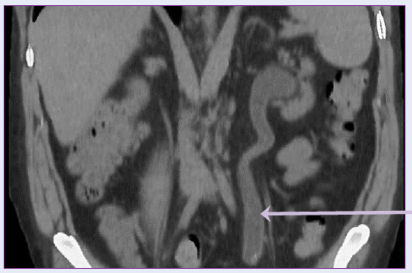
*Lesion removal prior to diagnosis not recommended

Nakar, et al. Plasminogen deficiency laboratory evaluation found on http://www.rarecoagulationdisorders.org/diseases/plasminogen-deficiency/%20laboratory-evaluation. Accessed 27 January 2023; Image on left from https://www.plgdeficiency.com/ Accessed 27 January 2023

Nephrology / Urology Specific Diagnostic Findings

INITIAL PRESENTATION	ADVANCED DISEASE
✦ Microscopic & gross hematuria ✦ Sterile pyuria ✦ Mucous-like debris ✦ Ligneous lesions in collecting system and ureters ✦ Renal calculi	✦ Ligneous lesions in collecting system & ureters ✦ Hydronephrosis ✦ Obstructive uropathy ✦ Recurrent renal calculi ✦ Chronic obstructive renal failure

Untreated



Images courtesy of IHTC

Nephrology / Urology Specific Treatment Considerations

- New or suspected diagnosis:
  - Obtain diagnostic blood test (plasminogen activity level) or refer to hematologist to order
  - If confirmed, refer to HTC to establish care and perform complete review of systems
    - Patients may have more than one system affected at presentation or occurring over time
- Confirmed diagnosis:
  - Coordinate clinical care and collaborate closely with existing care team at HTC
  - Send clinical notes and photos
- Be suspicious of common diagnoses:
  - Renal colic
    - May result from PLGD-associated renal collecting system involvement
  - Ureteral obstruction
    - May result from PLGD-associated stones; ligneous lesions become fibrotic and may calcify
- In patients with a diagnosis of type 1 plasminogen deficiency, urinary tract complications can occur including
  - Sterile pyuria
  - Recurrent hematuria
  - Renal calculi
  - Ureteral and/or bladder lesions
  - Obstruction
- Individuals with renal lesions may develop hematuria and pain as fibrous tissue is passed or obstructs urinary outflow

Learn More:

Partners in Bleeding Disorders Education

PLASMINOGEN DEFICIENCY FOUNDATION

The Plasminogen Deficiency Foundation gratefully acknowledges Partners in Bleeding Disorders Education for their assistance and for granting permission to use several graphics in creating this document.