Check for updates

CASE REPORT

Bilateral adrenal hemorrhage due to heparin-induced thrombocytopenia following partial nephrectomy – a case report [version 1; peer review: 3 approved]

Ashley G. Winter¹, Ranjith Ramasamy²

¹Department of Urology, New York Presbyterian Hospital, Weill Medical College of Cornell University, New York, 10065, USA

²Department of Urology, Baylor College of Medicine, Houston, Texas, 77030, USA

V1 First published: 23 Jan 2014, 3:24
<https://doi.org/10.12688/f1000research.3-24.v1>

Latest published: 23 Jan 2014, 3:24
<https://doi.org/10.12688/f1000research.3-24.v1>

Abstract

Heparin-induced thrombocytopenia (HIT) can cause severe life-threatening events such as bilateral adrenal hemorrhage (BAH). A 48-year-old female developed a pulmonary embolus (PE) following partial nephrectomy. The anticoagulation treatment for her PE was complicated by HIT and subsequent BAH. To the author's knowledge, this is the first reported case of HIT-associated BAH following renal surgery.

Keywords

bilateral adrenal hemorrhage, heparin-induced thrombocytopenia, HIT, partial nephrectomy

Open Peer Review

Approval Status

	1	2	3
version 1			
23 Jan 2014	view	view	view
<ol style="list-style-type: none"> Ryan Smith, University of Virginia Medical Center, Charlottesville, VA, USA Boback Berookhim, Memorial Sloan Kettering Cancer Center, New York, NY, USA Joyce Popoola, St George's Hospital, London, UK 			

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Ranjith Ramasamy (ranjithrama@gmail.com)

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2014 Winter AG and Ramasamy R. This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. Data associated with the article are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

How to cite this article: Winter AG and Ramasamy R. **Bilateral adrenal hemorrhage due to heparin-induced thrombocytopenia following partial nephrectomy – a case report [version 1; peer review: 3 approved]** F1000Research 2014, 3:24
<https://doi.org/10.12688/f1000research.3-24.v1>

First published: 23 Jan 2014, 3:24 <https://doi.org/10.12688/f1000research.3-24.v1>

Case presentation

A 48-year-old Caucasian female with a past medical history of hypothyroidism presented to us with an incidentally discovered 3 cm enhancing right renal mass. Her home medications included levothyroxine and oral contraceptives. She underwent an uncomplicated robotic-assisted laparoscopic right partial nephrectomy. The patient received routine perioperative deep venous thrombosis (DVT) prophylaxis with sequential compression devices, (SCD). On postoperative day (POD) 2, she developed new-onset sinus tachycardia and showed depressed pulse-oximetry readings. As subsequent chest computed tomography (CT) scans demonstrated multiple large pulmonary emboli, she was started immediately on a continuous intravenous unfractionated heparin infusion, titrated to target an activated partial thromboplastin time (aPTT) of 64–97 seconds. The patient was transitioned to therapeutic anticoagulation with low-molecular-weight heparin (LMWH) at 1mg/Kg q12hrs on POD 3 and discharged the next day.

On postoperative day 6, she developed syncope and hypotension and was admitted to the hospital. Work up in the emergency room was remarkable for a hematocrit (HCT) of 19%, and a CT scan demonstrated a bleeding pseudoaneurysm in the nephrectomy bed. She responded to red blood cell transfusion (4 units) and embolization of the pseudoaneurysm, becoming normotensive with a HCT of 26.2%. Anticoagulation with LMWH at 1mg/Kg was resumed the next day. She was discharged from the hospital on POD 10.

The patient presented to the surgeon's office on postoperative day 13 with progressive lethargy and subjective fevers. She was normotensive but tachycardic, and was admitted with concern for recurrent hemorrhage. Laboratory analysis at that time was remarkable for a leukocytosis to (16,000/ μ L), thrombocytopenia of 49,000/ μ L (from a pre-operative value of 234,000/ μ L), hyponatremia to 125mEq/L (baseline of 139mEq/L) and a relatively normal HCT of 31.7%. CT scan of the adrenal glands demonstrated bilateral adrenal gland enlargement and hyperdensity, consistent with BAH (Figure 1). Within 2 hours of initiating 50 mg intravenous hydrocortisone every 8 hours, her pulse decreased from 128 beats per minute (bpm) to 107bpm, and her blood pressure increase from 89/54mmHg 115/63mmHg. A percutaneous supra-renal inferior-vena-cava filter (IVCF) was placed by interventional radiology and an argatroban infusion started. The patient underwent careful titration to an outpatient regimen of fludrocortisone, hydrocortisone, and fondaparinux. She was discharged with a platelet count of 141,000/ μ L and serum sodium of 139mEq/L. After 12 months follow-up, the patient remains on non-heparin anticoagulation and steroid supplementation.

Discussion

Heparin-induced thrombocytopenia is an immune-mediated complication occurring infrequently following exposure to unfractionated or low-molecular weight heparin. HIT occurs when a complex between IgG antibodies and heparin-platelet-factor-4 forms. The antibodies activate platelets by binding to the Fc γ IIa receptor, which results in systemic thrombosis and consumptive thrombocytopenia¹.

Figure 1. Non-contrast computed tomography scan of adrenal glands. CT scan of adrenal glands; white arrows indicate severely enlarged, hyperdense, adrenal glands bilaterally consistent with adrenal hemorrhage.

With their rich arterial supply and single central vein, the adrenal glands are particularly susceptible to congestive hemorrhage following venous thrombosis. Adrenal hemorrhage associated with HIT tends to be bilateral, resulting in severe clinical manifestations from abdominal pain, fever and lethargy, to catastrophic hemodynamic collapse². In the post-surgical patient, these symptoms can be confused with more common complications, such as sepsis or hemorrhage. As undiagnosed cases tend to be fatal, a prompt recognition is crucial².

Few cases of HIT-associated BAH have been previously described in the literature^{2–4}. Approximately 90% of the patients are post-surgical, with the most common operations being orthopedic. HIT may be an important cause of BAH, accounting for up to 10% of the cases⁴. To our knowledge, this is the first reported case of HIT-associated BAH following partial nephrectomy in particular, or urologic surgery in general. Our case highlights two critical points; 1) the diagnostic complexity of HIT-associated BAH, and 2) the possibility of a successful clinical outcome when rapid diagnosis is made.

Consent

Written informed consent for publication of clinical details was obtained from the patient.

Author contributions

Ashley Winter performed the case research and wrote the initial manuscript draft.

Ranjith Ramasamy performed manuscript edits and review.

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

Acknowledgements

We would like to acknowledge Joseph Del Pizzo for the referral of this patient.

References

1. Namias N: **Chance favors the prepared mind: The association between heparin-induced thrombocytopenia and bilateral adrenal hemorrhage.** *Crit Care Med.* 2011; **39**(4): 912–3.
[PubMed Abstract](#) | [Publisher Full Text](#)
2. Rosenberger LH, Smith PW, Sawyer RG, *et al.*: **Bilateral adrenal hemorrhage: the unrecognized cause of hemodynamic collapse associated with heparin-induced thrombocytopenia.** *Crit Care Med.* 2011; **39**(4): 833–838.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
3. Chow VW, Abnoui F, Huddleston JJ, *et al.*: **Heparin-Induced Thrombocytopenia After Total Knee Arthroplasty, With Subsequent Adrenal Hemorrhage.** *J Arthroplasty.* 2012; **27**(7): 1413.e15–e18.
[PubMed Abstract](#) | [Publisher Full Text](#)
4. Ketha S, Smithedajkul P, Vella A, *et al.*: **Adrenal haemorrhage due to heparin-induced thrombocytopenia.** *Thromb Haemost.* 2013; **109**(4): 669–75.
[PubMed Abstract](#) | [Publisher Full Text](#)

Open Peer Review

Current Peer Review Status:

Version 1

Reviewer Report 17 March 2014

<https://doi.org/10.5256/f1000research.3515.r4138>

© 2014 Popoola J. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Joyce Popoola

Department of Renal Medicine and Transplantation, St George's Hospital, London, UK

The paper highlights a relatively uncommon complication which could easily be overlooked if no thought is given to it.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 24 February 2014

<https://doi.org/10.5256/f1000research.3515.r3791>

© 2014 Berookhim B. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Boback Berookhim

Memorial Sloan Kettering Cancer Center, New York, NY, USA

The authors provide a report of an interesting clinical situation following robotic assisted partial nephrectomy. The difficulties of diagnosis and non-specific presentation of potentially life-threatening bilateral adrenal hemorrhage in a patient with previously diagnosed pseudoaneurysm are clearly spelled out. An excellent literature review is provided. This article serves as a reminder to the urologist of the untoward and life threatening potential effects of heparin induced thrombocytopenia, and the importance of prompt diagnosis and treatment of BAH.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 24 January 2014

<https://doi.org/10.5256/f1000research.3515.r3326>

© 2014 Smith R. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Ryan Smith

Department of Urology, University of Virginia Medical Center, Charlottesville, VA, USA

The authors have composed an interesting case report with a good review of the literature. Anticoagulation requirements before and after Urologic surgery have significant importance and can result in a myriad of post-operative complications. Prompt recognition of these is essential to prevent additional patient morbidity. HIT-associated BAH represents a less commonly seen complication following anticoagulation and it is important for surgeons to be aware of this possibility.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research