



Novel use of Bromelain in Management of Chronic Rectus Sheath Hematoma: A Case Report

Ernest Cheng^{1,3}; Amit Sarkar¹; Suhrid Lodh²; Sarah J Valle^{1,3}; David L Morris^{1,3}

¹Department of Surgery, St George Hospital, Kogarah, NSW 2217, Australia

²Department of Radiology, St George Hospital, Kogarah, NSW 2217, Australia

³St George Clinical School, University of New South Wales, NSW Australia

*Corresponding Author(s): Ernest Cheng

Department of Surgery, St George Hospital, Kogarah
NSW 2217, Australia
Email: ernestmcheng@gmail.com

Abstract

Rectus sheath haematomas are uncommon causes of abdominal pain resulting from bleeding into the rectus sheath [1]. We report a case of a 67-year-old female with a symptomatic, non-resolved chronic abdominal haematoma successfully treated with Bromelain. A 14-French pigtail drain was inserted into her haematoma allowing Bromelain administration and subsequent haematoma extraction. We demonstrated symptomatic improvement with minimal side effects and significant reduction in haematoma size.

The purpose of reporting this case is to demonstrate the potential use of Bromelain in failed conservative management of haematomas and as alternative therapy when surgery is contraindicated.

Received: May 12, 2019

Accepted: Jun 25, 2020

Published Online: Jun 30, 2020

Journal: Journal of Abdominal Wall Reconstruction

Publisher: MedDocs Publishers LLC

Online edition: <http://meddocsonline.org/>

Copyright: © Cheng E (2020). *This Article is distributed under the terms of Creative Commons Attribution 4.0 International License*

Keywords: Bromelain; Infected seroma; Hernia mesh infection; Complex abdominal wall; Ventral hernia repair

Case presentation

A 67-year-old female presented with a failed drainage of a chronic symptomatic right sided rectus sheath haematoma. The haematoma developed spontaneously two years prior, secondary to therapeutic enoxaparin anticoagulation treatment of bilateral pulmonary embolism. On this presentation, she experienced chronic abdominal symptoms including pain, distention and bladder weakness. Previous complications from this haematoma include abdominal compartment syndrome and bilateral hydronephrosis requiring ureteric stenting. She had failed conservative management, angioembolisation and percutaneous drainage due the viscosity of the haematoma content.

On this admission, a 14 french self-retaining pigtail drain was inserted under Computer Tomography (CT) radiological guidance into the rectus sheath haematoma. Attempted aspiration of the drain prior to instillation of the drug did not yield any of the vicious fluid. A formulation of 30mg bromelain in 40ml of 5% glucose solution was instilled through the drain. Aspiration of the haematoma was performed on the subsequent day, 24 hours following each dose of the bromelain mixture. The patient received a total of three doses of bromelain with sequential aspiration and a CT was performed prior to removal.



Cite this article: Cheng E, Sarkar A, Lodh S, Valle SJ, Morris DL. Novel use of Bromelain in Management of Chronic Rectus Sheath Hematoma: A case report. *J Abdom Wall Reconstr.* 2020; 3(1): 1007.

Results

A total of 385ml dark blood-stained fluid was aspirated from the drain. Treatment side effects were minimal. The patient experienced discomfort on drain insertion and pyrexia to 38.9C and leucocytosis ($12.3 \times 10^9/L$) post-bromelain administration. Abdominal discomfort improved with each extraction of the haematoma. Treatment was ceased on day three as abdominal symptoms resolved. She was discharged and followed up one month later where she remained asymptomatic.

A baseline Computed Tomography (CT) Scan was performed post drain insertion, prior to the first treatment and haematoma extraction. The pelvic haematoma measured at its widest diameter as 79.16mm x 60.20mm on axial view and 171.52mm x 59.67mm on longitudinal views (Figure 1). A post treatment CT scan was performed and demonstrated a significant reduction in collection size. Comparatively on axial and longitudinal view the maximum diameter was 76.45mm x 41.28mm and 162.37mm x 45.59mm, respectively (Figures 1 & 2).

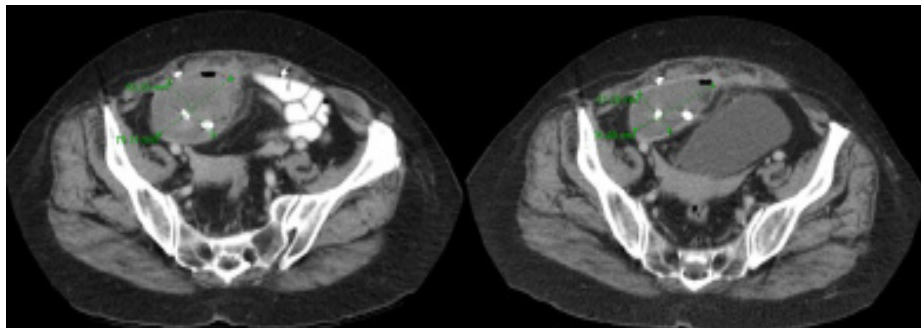


Figure 1

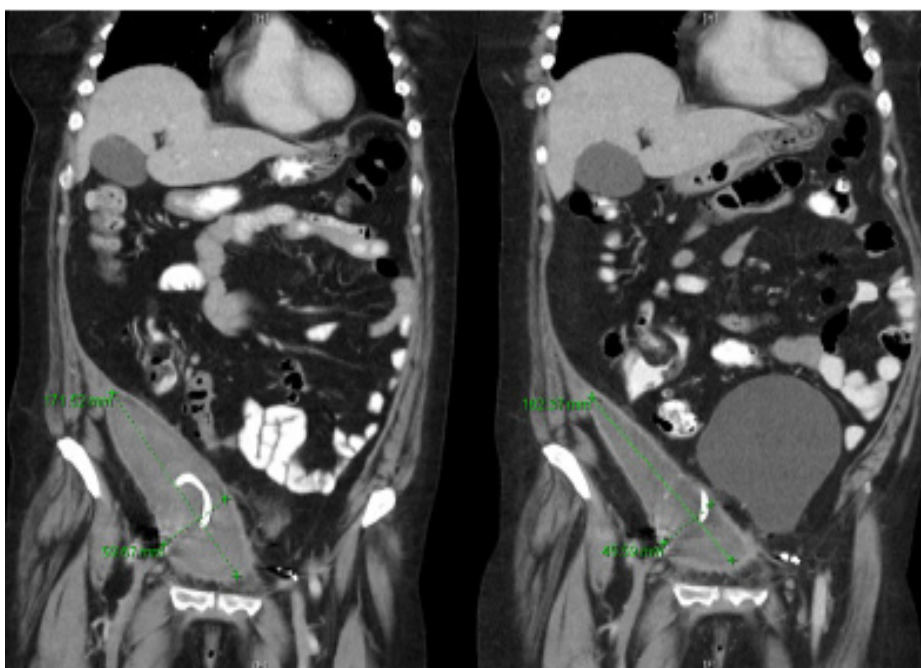


Figure 2

Discussion

Rectus sheath haematomas occur due to damage to epigastric arteries from blunt abdominal trauma or spontaneously with anticoagulation use [2]. The growing use of anticoagulation medications and thrombolysis therapy has increased the incidence of rectus sheath haematomas [3]. Acute unstable patients with RSH present with abdominal pain, palpable abdominal mass and signs of hypovolaemic shock. Initial management is conservative with volume replacement, correction of coagulopathy and compression [4]. Failure of conservative management may require interventional measures such as arterial embolization and intraoperative vessel ligation [5]. However, rectus sheath haematomas are clinically underdiagnosed and failure of early management increases the potential for large symptomatic haematomas [6]. Patients with stable rectus sheath haematomas can be monitored, or if symptomatic, percutaneous drainage to reduce the space-occupying burden [7]. Those who develop rectus sheath haematomas spontane-

ously may find ongoing expansion of the haematoma due to the continuation of anticoagulation therapy. Furthermore, straining from coughing or constipation and mild trauma can further precipitate bleeding into the haematoma [1,7].

Percutaneous drainages can fail or result in incomplete drainage due to the clotting and viscous properties of the haematoma material. Failure of minimally invasive interventions may require open surgery for evacuation of haematoma [7]. 77- 92% of patients with rectus sheath haematomas are on anticoagulation therapy. These patients often have concurrent cardiac and pulmonary co-morbidities and are thus at greater surgical risk [1,8]. We demonstrate the uses Bromelain to dissolve a rectus sheath haematoma to facilitate percutaneous drainage.

Bromelain is a proteolytic enzyme mixture derived from pineapple stems with various biochemical properties including

modulation of immune, inflammatory and haemostatic responses [9]. Clinical applications include chemoprevention and inhibition of malignant growth in various cancers, treatment of inflammatory diseases and debridement of severe burns [10,11]. In this case study, Bromelain's fibrinolytic, anti-platelet and antithrombotic activity is of interest [9]. We are currently studying the effect of Bromelain in combination of N-Acetylcysteine to treat patients with inoperable mucinous tumours. Synergy between Bromelain and N-Acetylcysteine has been reported with inhibition of gastrointestinal cancer cells in vivo and a range of cancers both in vivo and in vitro [12,13]. N-Acetylcysteine was withheld from this treatment although it has mucolytic properties as its role in this setting is yet to be established. Additionally, we recently published a case report demonstrating the successful utility of Bromelain in the management of an infected seroma with mesh involvement [14].

In the current literature, management of stable rectus sheath haematomas is limited; those who fail conservative and percutaneous drainage require invasive surgical intervention [2]. In combining the unique properties of Bromelain with percutaneous drainage, we enhance the success of minimally invasive methods in haematoma extractions, thereby reducing mass effect and provide symptomatic relief. Use of Bromelain in haematoma reduction is not only therapeutic but also protective. It can potential reduce the incidence of haematoma expansion and rupture resulting in abdominal compartment syndrome, massive hemoperitoneum, acute renal failure, small bowel infarction and possibly death [4]. For those on anticoagulation therapy, percutaneous drain insertions permit for shorter cessation time for of anticoagulation compare to open surgery and there is a safer and lower risk intervention [15].

Conclusion

This is the first reported case to demonstrate minimally invasive rectus sheath haematoma reduction with Bromelain. Active intervention in symptomatic patients with this novel therapy can potentially relieve chronic pain, reduce hospital stay and reduce mortality. Our case broadens the potential clinical application of Bromelain in addition to its use in mucinous tumours and infected seromas.

References

- Karapolat B, Tasdelen HA, Korkmaz HAA. Conservative Treatment of Spontaneous Rectus Sheath Hematomas: Single Center Experience and Literature Review. *Emerg Med Int.* 2019; 2019: 2406873.
- Hatjipetrou A, Anyfantakis D and Kastanakis M. Rectus sheath hematoma: a review of the literature. *Int J Surg.* 2015; 13: 267-271.
- Ueno T, Nakamura T, Hikichi H, Arai A, Suzuki C, et al. Rectus Sheath Hematoma Following Intravenous Thrombolysis With Recombinant Tissue Plasminogen Activator for Cerebral Infarction: A Case Report. *J Stroke Cerebrovasc Dis.* 2018; 27: e237-e238.
- Salemis NS, Gourgiotis S, Karalis G. Diagnostic evaluation and management of patients with rectus sheath hematoma. A retrospective study. *Int J Surg.* 2010; 8: 290-293.
- Rimola J, Perendreu J, Falco J, Fortuno JR, Massuet A, et al. Percutaneous arterial embolization in the management of rectus sheath hematoma. *AJR Am J Roentgenol.* 2007; 188: W497-502.
- Fitzgerald JE, Fitzgerald LA, Anderson FE, Acheson AG. The changing nature of rectus sheath haematoma: case series and literature review. *Int J Surg.* 2009; 7: 150-154.
- Gradauskas A, Venclauskas L, Pazusis M, Karpavicius A, Maleckas A. Comparison of the Different Treatment Strategies for Patients with Rectus Sheath Haematoma. *Medicina (Kaunas).* 2018; 54.
- Sheth HS, Kumar R, DiNella J, Janov C, Kaldas H, et al. Evaluation of Risk Factors for Rectus Sheath Hematoma. *Clin Appl Thromb Hemost.* 2016; 22: 292-296.
- Pavan R, Jain S, Shraddha, Kumar A. Properties and therapeutic application of bromelain: a review. *Biotechnol Res Int.* 2012; 2012: 976203.
- Rathnavelu V, Alitheen NB, Sohila S, Kanagesan S, Ramesh R. Potential role of bromelain in clinical and therapeutic applications. *Biomed Rep.* 2016; 5: 283-238.
- Loo YL, Goh BKL, Jeffery S. An Overview of the Use of Bromelain-Based Enzymatic Debridement (Nexobrid(R)) in Deep Partial and Full Thickness Burns: Appraising the Evidence. *J Burn Care Res.* 2018; 39: 932-938.
- Amini A, Masoumi-Moghaddam S, Ehteda A, Liauw W, Morris DL. Potentiation of chemotherapeutics by bromelain and N-acetylcysteine: sequential and combination therapy of gastrointestinal cancer cells. *Am J Cancer Res.* 2016; 6: 350-369.
- Amini A, Masoumi-Moghaddam S, Ehteda A, Morris DL. Bromelain and N-acetylcysteine inhibit proliferation and survival of gastrointestinal cancer cells in vitro: significance of combination therapy. *J Exp Clin Cancer Res.* 2014; 33: 92.
- Cheng E, Sarkar A, Valle SJ, Morris DL. Novel use of bromelain in the management of infected prosthetic surgical mesh after ventral hernia repair. *Int J Abdom Wall Hernia Surg.* 2020; 3: 34-37.
- Cook BW. Anticoagulation management. *Semin Intervent Radiol.* 2010; 27: 360-367.