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CLINICAL CASE

# Spontaneous psoas muscle hematoma during Rivaroxaban therapy

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## Abstract

*We report on the case of an 81 year old male who developed a spontaneous retroperitoneal bleed of the psoas muscle while on Rivaroxaban therapy for the prevention of arterial emboli due to atrial fibrillation (AF). Rivaroxaban is a factor Xa inhibitor which is indicated for use in patients with a history of AF, pulmonary emboli and deep vein thrombosis. Rivaroxaban is associated with increased risk of bleeding. Few reports exist in the literature describing spontaneous bleeding associated with the use of Rivaroxaban. But, none reported spontaneous retroperitoneal psoas muscle hematoma, as in the case we are presenting.*

## Keywords

*Rivaroxaban, hemorrhage/etiology, drug-related side effects and adverse reactions, retroperitoneal space, adult*

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## Introduction

Rivaroxaban is a factor Xa inhibitor that has been shown to be non-inferior to warfarin in stroke prevention in AF and in treatment of venous thromboembolism [1,2]. The most common reported side effect of Rivaroxaban use is bleeding. In the Dresden NOAC Registry, gastrointestinal Rivaroxaban related bleeding is the most common type of bleeding with an estimated incidence of 31 per 1,000 patients/year (95 % CI 22–43) for stroke prevention in AF [3]. There is a lack of specific antidotes for bleeding reversal in Rivaroxaban-induced bleeding. Spontaneous retroperitoneal bleeding has not previously been discussed; we present the first case here.

## Case Report

An 81 year old male, with a history of AF and daily use of Rivaroxaban, was being evaluated and treated for pneumonia and recurrent episodes of forceful coughing 3 days before he presented to the emergency department with right sided cramping pain in his thigh with an antalgic gait. The pain was severe enough to prevent him from standing or walking, and was presumed to be musculoskeletal in nature. The patient was admitted to the hospital. On admission, his vital signs included – temperature: 98.2 °F, pulse: 65 beats/min, blood pressure (BP): 143/73 mmHg, pulse oximetry: 92% on room air. His physical exam was significant for an antalgic gait and right medial thigh pain upon internal rotation of the right hip. He had intact range of motion in both the right knee and hip. His abdominal exam was normal. His labs were significant for white blood cells (WBC): 10.8 x $10^9$/L, haemoglobin (Hgb): 120 g/L, haematocrit (Hct): 36.8%, platelets (Plt): 207 x $10^9$/L, prothrombin time (PT): 24.6 seconds and international normalized ratio (INR): 2.3. The right knee, hip and femur X-ray revealed chronic osteoarthritic changes in the knee and hip with no evidence of fractures. The next day (day 2) post admission, his Hgb and Hct levels decreased, with Hgb trending from 120 g/L on admission, to 92 g/L the next day, and to 69 g/L on day 3. On day 3, the patient developed a syncopal episode and found to have a significant orthostatic BP drop. Because of the sudden drop in his Hgb level, he was subsequently taken for a computerised tomography (CT) scan of his abdomen/pelvis which revealed a large diffuse psoas muscle hematoma (Figure 1, Figure 3 supplemental) with blood escaping the muscle and surrounding the renal (Gerota's) fascia (Figure 2, Figure 4 supplemental).

He subsequently received 2 units of blood as well as fluids and on day 4 was watched to assess for continued bleeding as well as the possibility for compartment syndrome. His right thigh pain improved and his anaemia subsequently improved to 93 g/L after transfusion and remained stable for the rest of his admission. His orthostatic hypotension was corrected with fluids and the blood transfusion. The patient was discharged home with the instructions to hold Rivaroxaban and to follow up with his cardiologist for reassessment of his anticoagulation regimen.

## Discussion

Newer oral anticoagulant agents are currently being utilized to address the shortcomings of traditional anticoagulation with warfarin and heparin. Rivaroxaban directly inhibits Factor Xa and interrupts both the intrinsic and extrinsic pathway of the coagulation cascade [4]. Rivaroxaban is currently indicated for use in patients for AF, prophylaxis of

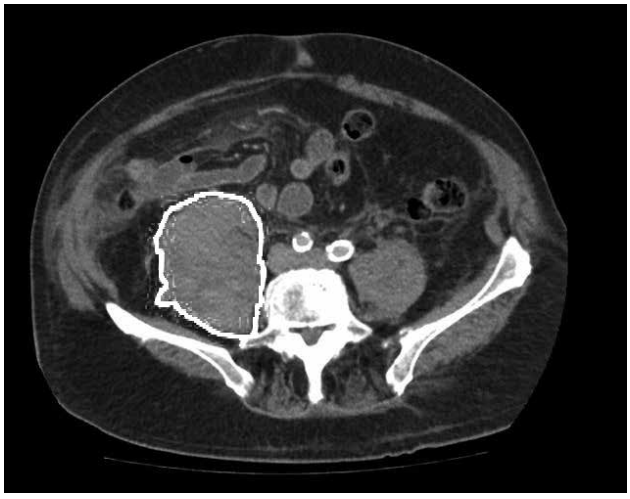

**Figure 1.** CT scan without contrast showing enlargement of the psoas muscle due to infiltration of blood into the tissues of the psoas

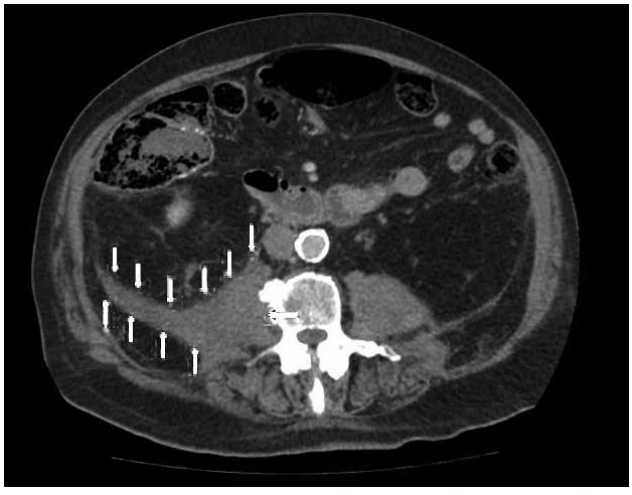

**Figure 2.** A CT scan without contrast showing bleeding into the psoas muscle with subsequent blood loss surrounding the renal fascia

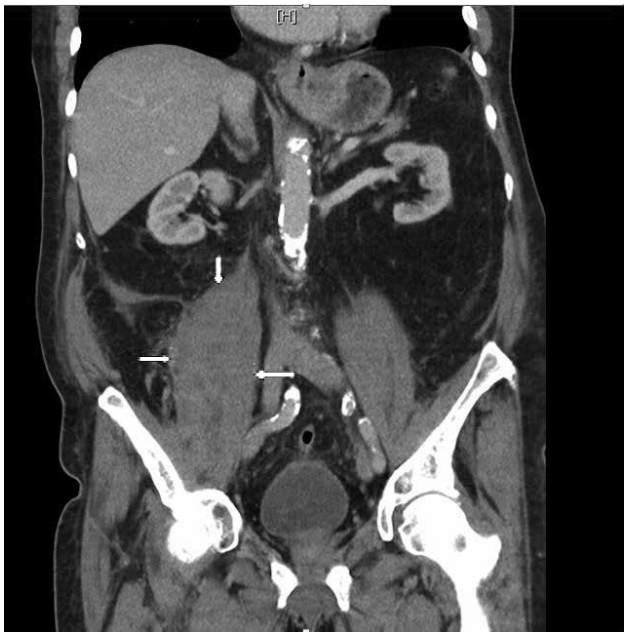

**Figure 3.** CT scan without contrast; coronal view; showing enlargement of the psoas muscle due to infiltration of blood into the tissues of the psoas.

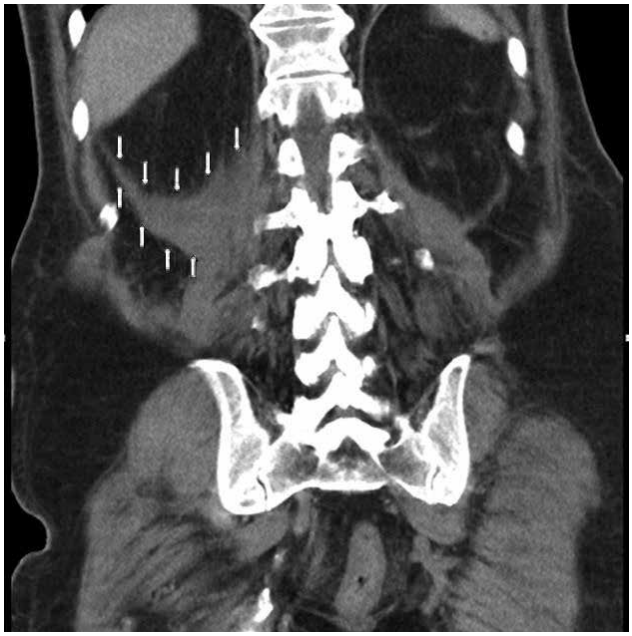

**Figure 4.** CT scan without contrast; coronal view; showing bleeding into the psoas muscle and the surrounding renal fascia

deep venous thrombosis, and prophylaxis of deep vein thrombosis after hip and knee replacement surgery [5-9]. The use of Rivaroxaban is increasing as it does not require INR monitoring, leading to more events of bleeding complications. There are no specific antidotes for the anticoagulant effect of Rivaroxaban, thus the management of the bleeding complications include support and observation. The non-Vitamin K antagonist oral anticoagulants (NOACs) have a short half-life with large inter-individual variability and the possibility of available reversion is poorly known, especially the efficacy/tolerance profiles of non-specific pro-coagulant drugs. 4-factor prothrombin complex concentrates (PCCs), activated PCC, and factor VIII inhibitor bypassing activity (FEIBA) are proposed modalities of treatment in life threatening bleeding [10].

Spontaneous bleeding associated with the use of Rivaroxaban has been reported in the literature. Jaeger *et al.* describes a case of a 61 year old female who developed a spontaneous spinal subdural hematoma while using Rivaroxaban and subsequently developed a transient paralysis which resolved without surgical intervention [11]. Kocayigit *et al.* reported a 75 year old female with repeated coughing episodes who developed a spontaneous rectus sheath hematoma [12]. In our case, the patient developed spontaneous retroperitoneal psoas muscle hematoma and was managed conservatively with fluids and a blood transfusion. No similar reported cases of a spontaneous retroperitoneal hematoma of the psoas muscle due to Rivaroxaban therapy have been previously reported in the literature.

## Conclusion

Rivaroxaban use is associated with several adverse events, most prevalent is an increased bleeding risk. Healthcare providers need to be aware of the risk of spontaneous bleeding associated with Rivaroxaban use. Further studies need to be conducted to fully quantify the incidence and risk factors for spontaneous retroperitoneal bleeding while on Rivaroxaban therapy.

**Conflict of interest:** None declared

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