



## Acute Aortic Thrombosis Following Anterior Resection - A Rare Complication

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### Abstract

**Introduction:** Anterior resection is a commonly performed surgery for rectal cancer worldwide. It is associated with a wide spectrum of complications that include hemorrhage, pelvic sepsis, wound infection, anastomotic breakdown, deep vein thrombosis, peripheral nerve injury, impotence and urological dysfunction. However acute aortic thrombosis post-anterior resection is a very rare complication.

**Case Presentation:** We report a rare case of aortic thrombosis in a 67-year-old gentleman following anterior resection for rectal cancer.

**Discussion:** We discuss the possible causes as there are many postulations regarding the etiology of this devastating complication. Prolonged surgery, abnormal blood coagulation in a cancer patient, the lithotomy position, and the presence of peripheral vascular disease were predisposing factors contributing to this rare acute aortic thrombosis in our patient. A standard routine neurovascular examination of the extremities should be done in the postoperative period to help detect early any neurovascular complications. The use of prophylactic anticoagulants such as fondaparinux, low molecular weight heparin, or low dose unfractionated heparin is strongly recommended in high-risk surgery patients undergoing a major surgery, helping in the prevention of thromboembolic episodes following surgery.

**Keywords:** Anterior resection, Aortic thrombosis, Rectal cancer, Surgical management

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### Introduction

A 67-year-old gentleman underwent elective anterior resection for a rectosigmoid carcinoma. Preoperatively, the patient-controlled analgesia (PCA) epidural catheter and thrombo-embolus deterrent (TED) stockings were applied and the patient was placed in the Lloyd-Davies position. The initial laparoscopic approach was abandoned when

the tumor was found to be adherent to the bladder dome. With the help of the Balfour self-retaining retractor, the anterior resection was completed together with a wedge resection of the bladder. The operation took 5 hours and 25 minutes.

In the evening after surgery, the patient experienced numbness on both lower extremities. This was attributed to the PCA. The TED stockings prevented detection of any noticeable changes to the

lower limbs (LL). In the morning when the patient complained of LL paralysis, the LL was found to be ischemic. A CT angiogram showed extensive thrombosis/total occlusion of the lower abdominal aorta from the level of inferior mesenteric artery. The patient was urgently referred to the nearest vascular unit. Intravenous heparin was commenced. Unfortunately, both legs were found to be non-viable upon arrival of the vascular team. Bilateral hip disarticulation was performed after demarcation and the patient succumbed to complications after protracted hospitalization.

## Discussion

This is the second case reported of the rare complication of acute aortic thrombosis post-anterior resection. Casillas et al. (1) were the first to report such a rare complication. The exact factors for this complication are unknown. However, there are many postulations regarding the cause of this devastating complication.

Complications following colorectal surgery for malignancy have been linked to multiple factors, mainly related to the patient factors and surgical techniques. It has been well recognized that cancer patients have hypercoagulable or prothrombotic states, which predispose them to thrombosis; however, venous thrombosis is more common than arterial thrombosis (2, 3). Other important patient intrinsic factors associated with vascular complications following colorectal surgery for malignancy are hypertension, hypercholesterolemia and smoking. These factors play significant roles in the development of atherosclerosis by inducing oxidative stress, endothelial dysfunction and vascular inflammation, which, in turn, lead to thrombus formation (4).

Surgical techniques play an important role in determining the potential for postoperative complications. Pelvic surgery mainly in locally advanced disease usually requires extensive and radical dissection. However, neurovascular complications associated with pelvic surgery are more often due to retractor blades or the position of the patient rather than direct operative injury (5-7). Lozman et al. (8) suggested that the impingement of

the external iliac artery by deep retractors such as the Bookwalter® retractor may obstruct arterial blood flow, leading to thrombosis. Femoral neuropathy has also been associated with a very deep and lateral placement of retractor blades that compresses the femoral nerve against the pelvic sidewall (9). However, in our case, the Balfour self-retaining retractor was used, featuring short blades.

Despite providing excellent exposure for pelvic surgery, the lithotomy position has been well-recognized as a cause of neurovascular complications (6, 10, 11). These complications are attributed to compartment syndrome by direct pressure from the stirrup (10). In addition, Horgan et al. (11) demonstrated that the combination of the lithotomy position with the Trendelenburg position causes profound reduction of lower limb perfusion rather than the lithotomy position itself. When pelvic surgery exceeds four hours, the risk of compartment syndrome increases dramatically, as demonstrated by Turnbull et al. (12). Therefore, it may be wise and appropriate to reposition the patient to a supine position temporarily to avoid these complications if the surgical procedure lasts beyond four hours.

Hence a standard routine neurovascular examination of the extremities should be done in the postoperative period to help detect early any neurovascular complications. The use of prophylactic anticoagulants such as fondaparinux, low molecular weight heparin, or low dose unfractionated heparin is strongly recommended in high-risk surgery patients undergoing a major surgery, helping prevent thromboembolic episodes (13).

## Conclusion

Acute aortic thrombosis post-anterior resection is a very rare complication. Prolonged surgery, abnormal blood coagulation in a cancer patient, the lithotomy position, and the presence of peripheral vascular disease were predisposing factors contributing to this rare acute aortic thrombosis in our patient. The PCA and compression stockings used by our patient prevented early detection of acute limb ischemia in the immediate postoperative period.

**Conflicts of interests:** None declared.

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