Superior mesenteric artery occlusion in a woman with ulcerative colitis. Presentation of a case and review of the literature

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Abstract. Active ulcerative colitis is a known risk factor for thromboembolic complications. The increased risk of venous thrombosis and pulmonary embolism is well established but arterial occlusion has also been reported. We describe a patient with ulcerative colitis and both popliteal and superior mesenteric artery occlusion. No underlying cause for these arterial occlusions was found. Although there are several theories to explain the increased thromboembolic risk in ulcerative colitis, a satisfactory explanation can not be given. This case emphasizes that it is important to include bowel ischaemia in the differential diagnosis of abdominal pain in ulcerative colitis.

Introduction
Many reports indicate that the incidence and prevalence of thromboembolic events is increased in inflammatory bowel disease (IBD) varying between 0.4-39%. Moreover, a three-fold increase of the risk of thromboembolic complications has been reported in patients with ulcerative colitis (UC).[1]. Although deep venous thrombosis and pulmonary embolism are most commonly reported, in up to two-thirds of cases, cerebral thrombosis, portal vein thrombosis and Budd-Chiari syndrome as well as thrombotic events at other sites, have been documented. In contrast, arterial thromboembolic complications have only rarely been described.[2] We report on a patient with both ulcerative colitis and superior mesenteric artery occlusion. A Medline search yielded only two similar cases.

Case report
A 36-year-old female presented elsewhere with diarrhoea, anal blood loss and a seven month history of weight loss. She took no medication except oral contraceptives(OC) and had stopped smoking seven months earlier. She was diagnosed with left-sided ulcerative colitis and was treated with oral mesalazine and mesalazine enemas. One month later she was admitted with an exacerbation of her colitis. She was treated with oral prednisone 60 mg daily. Cultures of the faeces showed no pathogens.

During admission, she suddenly developed arterial occlusion in both legs at the level of the popliteal artery. The occlusion in the left leg improved spontaneously and the right side was successfully treated by embolectomy and heparinization. Because of her active ulcerative colitis, thrombolytic drugs were not given. In view of this thromboembolic episode, transthoracic echocardiographic examination was performed which indicated thrombotic material in the left atrium. However this finding could not later be confirmed. After this episode, her abdominal pain worsened. Refractory ulcerative colitis or ischaemic colitis was suspected and she was referred to our hospital for further evaluation and treatment. On examination, the patient appeared very ill despite having normal haemodynamics. Her abdomen was tender without signs of peritonitis. Plain abdominal radiography showed dilated small and large bowel loops, without thumb-printing or free air. A differential diagnosis including worsening of the ulcerative colitis and acute mesenteric ischaemia was made. On explorative laparotomy, a partly necrotic and partly ischaemic small bowel and right colon were found. To save as much as possible of the jeopardized small bowel, a superior mesenteric arteriotomy was performed and a blood clot was removed. There were no detectable inflow or outflow problems underlying this thrombosis. However, after thrombectomy, the small bowel and right colon remained non-viable and the necrotic bowel was resected, leaving a 30 cm segment of proximal jejunum. Postoperatively, transoesophageal echocardiography showed no cardiac source of the embolus. After the patient recovered sufficiently, she was operated on again in order to create a proximal jejunostomy for drainage of intestinal fluids and a left hemicolecetomy was performed.

The patient was left with only a very short segment of jejunum and thus an extremely short bowel. Histopathological examination showed no arteriosclerosis. The bowel showed ischaemic changes and necrosis. Multiple venous and arterial thrombi were found in the mucosa (Figure 1). The extent of the necrotic changes was compatible with the diagnosis of superior mesenteric artery thrombosis. Total parenteral nutrition was started immediately after surgery. After weaning from the ventilator, she was transferred to the surgical ward.

She was screened for thrombophilia before she started on anticoagulants. (Table 1) The contraceptive drug was discontinued. After 10 weeks she was discharged to a specialized parenteral nutrition centre, for training in using parenteral nutrition at home. Bowel transplantation may be an option for her in the future. Subcutaneous anticoagulant therapy was recommended to be continued for one year.

Discussion
This case report describes a young female with known UC, who presented with peripheral arterial occlusion and acute superior mesenteric artery thrombosis, without signs of atherosclerosis. Apart from
the use of OC, no other risk factors were detected. In the literature only case reports were found on bowel ischaemia associated with OC. Most reports had been published in the nineteen-seventies and eighties and in 75% of cases dealt with mesenteric vein thrombosis although sporadic arterial occlusion was also reported [3]. Usually arterial disease is precipitated by atherosclerosis, a disease with a very low prevalence in young women. Combination of OC and known risk factors like smoking and hypertension increase this risk [4]. Our patient had stopped smoking 8 months earlier and had no other risk factors. Although the literature does not provide clear evidence that this acute SMA thrombosis was related to the use of OC, we nevertheless decided to advise against taking OC.

In the literature we also found an association between IBD and thromboembolic processes. The risk of venous thrombosis is well established. Patients at highest risk are those with active disease [2]. Several explanations have been proposed for the increased thromboembolic risk, which can be subdivided into three categories, 1) changes in clotting factors and the clotting cascade, 2) prothrombotic metabolic changes and 3) secondary changes in coagulation as a result of the inflammatory process itself due to complex interactions between leukocytes, activated platelets and endothelial cells in conjunction with substances like tissue factor and cytokines [5]. Of course general risk factors like dehydration, age and immobilization can also influence this risk.

Various clotting abnormalities have been suggested as contributing agents. In IBD thrombocytosis, elevations in fibrinogen, factor V, factor VIII, a lowered antithrombin III or protein S and APC resistance have been observed. No correlation between the clotting abnormality and the relatively high rate of thrombosis in IBD patients was found [2, 6, 7]. Prothrombotic metabolic changes comprise elevated levels of anticardiolipin antibodies, hyperhomocysteinaemia and changes in lipid spectrum, although a clear-cut association with clinically apparent thromboembolism is absent [8, 9].

Several explanations for the increased thromboembolic risk in IBD have been described. The most common are peripheral vein thrombosis and pulmonary embolism, although more uncommon sites can be affected as well [5]. Bowel infarction due to mesenteric venous thrombosis has been described in patients who had undergone prior abdominal surgery [10] and even as a presenting symptom of UC [11].

In contrast to venous thrombosis, arterial thromboembolism in IBD has rarely been described. Common sites for arterial thrombosis are the brain or peripheral arteries, whereas bowel ischaemia due to arterial occlusion is rarely reported [11]. To date, only two cases of spontaneous superior mesenteric artery thrombosis in UC have been described. Novotny et al. [12] describe a patient diagnosed at laparotomy with superior mesenteric artery thrombosis. Embolectomy was successful but she died of postoperative stroke. No additional cases were found in 262 survey forms completed by members of the American Society of Colon and Rectal Surgeons.

Brown et al [13] describe a 49-year-old male with active UC who was operated on for bowel ischaemia and later underwent small bowel transplantation for short bowel syndrome. In both cases no underlying cause for thrombosis was found.

In view of the potentially severe, even lethal consequences of thromboembolic events in patients with active IBD, and in view of the absence of guidelines, a tailored approach of thrombosis prophylaxis by anticoagulant therapy in these patients should be considered, taking into account disease activity and underlying predisposing factors. Since many aspects remain elusive, further studies on the haemostatic balance in IBD patients are warranted. A disease-related abnormality in the clotting cascade may perhaps be found to contribute to the higher thromboembolic risk in IBD. This might, in turn, may prevent the necessity for invasive embolectomy, partial bowel resection or even colectomy leading to short bowel syndrome.

References

Table 1. Results of the analysis of prothrombotic and potentially prothrombotic factors in our patient.

<table>
<thead>
<tr>
<th>Prothrombotic factors</th>
<th>Results (reference values)</th>
<th>Common changes seen in active CU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor V Leiden</td>
<td>Not found</td>
<td></td>
</tr>
<tr>
<td>Prothrombine mutation</td>
<td>Not found</td>
<td></td>
</tr>
<tr>
<td>Lupus anticoagulant</td>
<td>Not found</td>
<td></td>
</tr>
<tr>
<td>Anticardiolipines</td>
<td>Not found</td>
<td></td>
</tr>
<tr>
<td>Fasting Homocysteine</td>
<td>Normal</td>
<td>Elevated</td>
</tr>
<tr>
<td>Antithrombine III</td>
<td>85% (75-125%)</td>
<td>Decreased</td>
</tr>
<tr>
<td>Protein S</td>
<td>72% (60-140%)</td>
<td>Decreased</td>
</tr>
<tr>
<td>Protein C</td>
<td>61% (75-125%)</td>
<td>Resistance to protein C</td>
</tr>
<tr>
<td>Factor VIII</td>
<td>323 (50-150)</td>
<td>Elevated</td>
</tr>
<tr>
<td>Factor VII</td>
<td>12% (80-120%)</td>
<td></td>
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Figure 1 (by courtesy of M. de Gast, AIDS pathology) Resection specimen. Thrombus of artery and vein in bowel mucosa as result of long-standing superior mesenteric artery occlusion.


