

Emergency colectomy during mechanical circulatory support for septic cardiomyopathy



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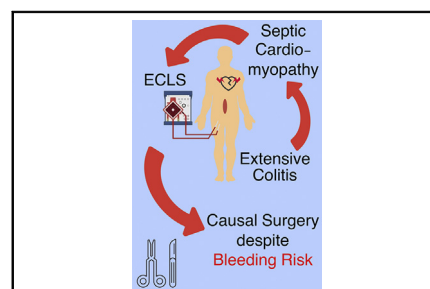
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Importance of causal surgery during mechanical circulatory support.

CENTRAL MESSAGE

Principles of causal surgery should be followed even in patients with extensive SCM that require MCS and have an increased risk for bleeding.

▶ Video clip is available online.

Ulcerative colitis (UC) is the most common chronic inflammatory bowel disorder (IBD) with a prevalence of up to 245 cases per 100,000 persons.¹ Twenty percent to 30% of patients require a colectomy after 25 years of disease activity due to megacolon and/or failing systemic therapy. These patients are particularly vulnerable to infection, resulting in 27.5% of all hospitalizations in patients with IBD. The local institutional review board (No. 19-179) and local ethics committee (No. 379/19) approved the study protocol and publication of data on April 2, 2019. The patient provided informed written consent for the publication of the study data on October 3, 2022.

CASE PRESENTATION

An 18-year-old patient was transferred from another hospital to our intensive care unit (ICU) due to acute respiratory deterioration. UC had been recently diagnosed, and infliximab was administered 9 and 22 days before admission.

Despite intensive supportive therapy, the patient developed a septic shock with moderate acute respiratory distress syndrome and acute kidney failure for which invasive ventilation and renal replacement therapy was initiated on the first day. The patient remained hemodynamically unstable and the

clinical course was complicated by septic cardiomyopathy (SCM) with severely reduced systolic left and right ventricular function (ie, left ventricular ejection fraction <15%) despite positive inotropic therapy. Therefore, venoarterial extracorporeal membrane oxygenation (VA-ECMO) was applied on day 2 using a percutaneous approach (multistage cannula with 25Fr) in the right femoral vein, arterial cannula with 19Fr in the left femoral artery, and distal limb perfusion. After 24 hours, the right and left ventricles remained dilated and ejection fraction was severely impaired despite VA-ECMO flow of 5.5 L/min; hence, a microaxial left ventricular assist device (Impella CP; Abiomed) was inserted to optimize left ventricle unloading. Ejection fraction slightly improved to 20% after 24 hours.

During VA-ECMO and Impella (ECMELLA) support, the patient developed progressive colitis/pancolitis with gastrointestinal bleeding that reached the maximum score for disease severity according to the Mayo scoring system. Due to acute life-threatening disease activity, uncontrolled hemorrhage, and failure of conservative treatment, a subtotal colectomy (rectum-sparing) was performed on day 4. Three revision surgeries, with packing and depacking, were executed due to recurrent intra-abdominal bleeding on day 7, 9, and 12, respectively. As heart function and perfusion recovered, transaminase levels simultaneously decreased

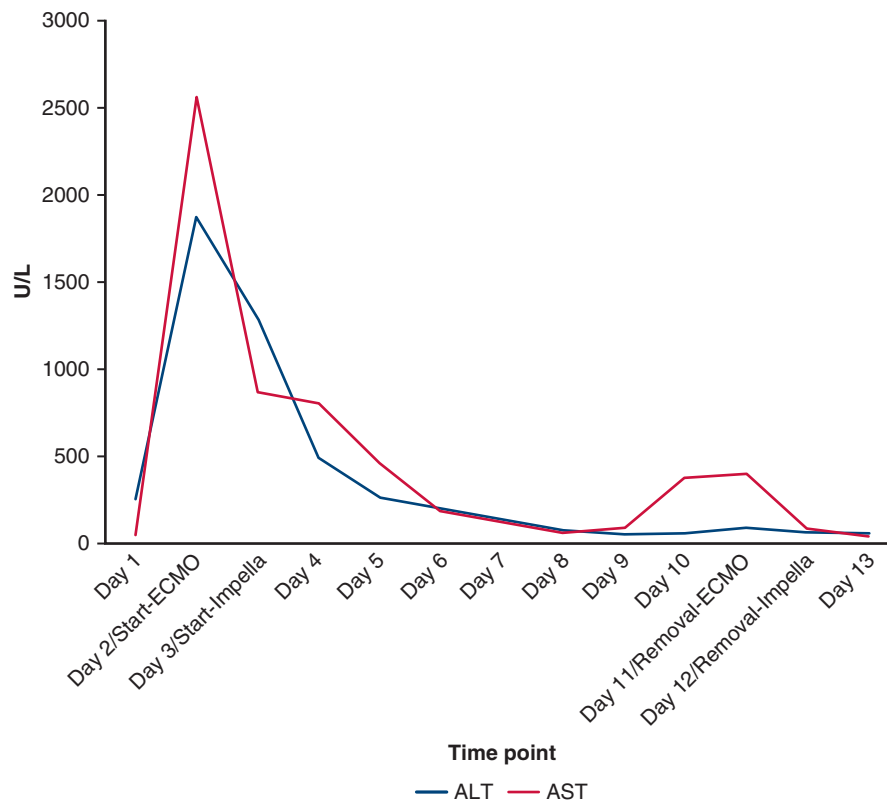


FIGURE 1. Time course of alanine-aminotransferase (ALT) and aspartate transaminase (AST) during support with extracorporeal membrane oxygenation (ECMO) and the Impella device (Abiomed).

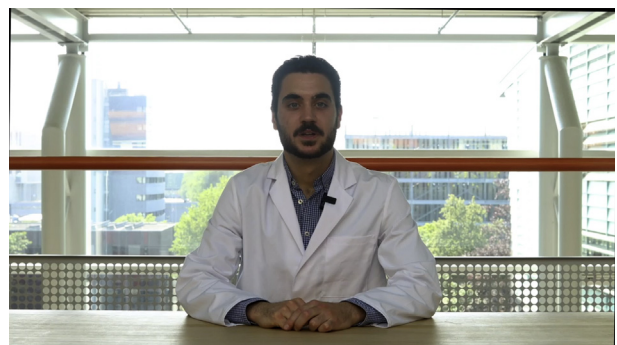
and confirmed circulatory therapy success (Figure 1). ECMELLA support was successfully removed at day 11 and 12, respectively. After 39 days in the ICU, the patient was transferred to the general ward for further recovery.

The patient was discharged after 61 days into rehabilitation care; further treatment of UC included topical corticosteroids and we reported improved general condition after 2 months during a follow-up in our post-ICU care outpatient clinic.

DISCUSSION

Patients with UC have markedly worsened sepsis-related outcomes compared with other IBDs.² A high proportion of these patients can be treated with conventional corticosteroids or rescue medical therapy with either cyclosporine or infliximab.¹ However, 10% of patients with UC will require surgery within the first year of diagnosis. Colectomy is curative for UC and medical therapy can be withdrawn, but it causes important short- and long-term complications. Our case was particularly interesting because the fulminant UC course was accompanied by SCM that required causal colectomy during ECMELLA support under close multidisciplinary cooperation. In addition, we summarized the case and discussed its relevance in a video (Video 1).

SCM is not clearly defined but common diagnostic criteria include sepsis with acute left and/or right ventricular dysfunction in the absence of other etiologies. Early treatment of SCM can reduce mortality and mechanical circulatory support is used in selected patients who do not respond to intensified medical therapy. Therefore, VA-ECMO can be a reasonable approach for septic shock.



VIDEO 1. Short summary of the case report and discussion of its relevance. ECMO, Extracorporeal membrane oxygenation; VA, veno-arterial. Video available at: [https://www.jtcvs.org/article/S2666-2507\(22\)00357-1/fulltext](https://www.jtcvs.org/article/S2666-2507(22)00357-1/fulltext).

Survival rates among patients with severely reduced left ventricular ejection fraction (<20%) were 62% in a recent meta-analysis.³

We described the course of transaminases (Figure 1) that helped to identify acute heart failure at an early stage, and eventually indicated recovery of the patient as a marker of successful right ventricular unloading and adequate systemic perfusion. Slattery and colleagues⁴ also reported that abnormal liver function tests were among the first abnormalities in a comparable case. We suggest that liver function tests can be a simple tool for early identification of acute heart failure in hospitalized patients.

CONCLUSIONS

We demonstrated a successful multidisciplinary approach with emergency colectomy under ECMELLA in an immunosuppressed patient with severe exacerbation of

UC and biventricular failure due to SCM. Principles of causal surgery should also be followed in patients with SCM that require intensive mechanical circulatory support and have an increased risk for bleeding complications. Furthermore, abnormal levels of transaminases can be among the first abnormalities in these patients and help to identify acute heart failure at an early stage.

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