CASE PRESENTATION

A 68-year-old woman was admitted to our emergency department for dyspnea, hypotension, vomiting, and diarrhea. Physical examination revealed purpura and ecchymoses (Figures 1–3). Blood analysis demonstrated an inflammatory syndrome (CRP: 455 mg/L) with neutrophilic leukocytosis (20,081/μl), thrombocytopenia (25,000/μl), acute kidney failure (creatinine: 3.22 mg/dl), impaired coagulation (D-dimer: >20,000 ng/ml, aPTT: 50 s, TT: 32 s, TP: 44%), and lactic acidosis (pH: 7.00, lactate: 4.8 mmol/L). Lifesaving support included blood culture, ceftriaxone, corticosteroids, fluid resuscitation, vasopressor, and mechanical ventilation. A transthoracic echocardiography was performed to assess left ventricular (LV) function and standard echocardiographic variables. In particular, LV ejection fraction (LVEF) with the biplane Simpson’s method (53.4%; Figure 4) and 3D echocardiography (53%) were normal (Video S1). Conversely, speckle-tracking echocardiography (STE) findings demonstrated abnormal LV systolic function with a global longitudinal strain (GLS) calculated at −13.4% (Video S2). We added dobutamine to norepinephrine because myocardial impairment was evidenced by a depressed GLS value. Within 2h, we initially observed a decrease in the norepinephrine dose associated with a decline in lactate level. The clinical course subsequently deteriorated with the development of digital necrosis and acute kidney injury requiring bilateral transtibial amputations and continuous veno-venous hemofiltration. Finally, vasoactive agents were weaned on the tenth day, and the patient was discharged from intensive care 20 days later.

DISCUSSION

Profound but reversible myocardial depression in septic shock patients has been described in the literature. Transthoracic echocardiography is the first-line tool to assess patients in shock. Conventional echocardiographic variables may be affected by loading conditions. STE is a novel technological modality allowing early detection of LV dysfunction, prior to decrease in LVEF. Normal value of GLS is reported in the range of −20% in healthy subjects. The prognostic value of sepsis-induced myocardial dysfunction detected by STE has been suggested in
In this review, worse GLS values directly correlated with higher mortality in comparison with abnormal LVEF. Clinical implications include monitoring of myocardial dysfunction and institution of appropriate cardioprotective strategies early in the course of the disease. However, the clinical significance of LV systolic dysfunction detected in septic patients is uncertain. Also, the use of inotropic agents and treatment goals are debated.

Therefore, further studies are needed to validate the routine use of STE in the hemodynamic assessment of septic patients.

3 | CONCLUSION

Identifying cardiac failure in sepsis remains challenging. GLS represents a more sensitive indicator of septic LV dysfunction compared to conventional measurement of LVEF. This clinical picture illustrates that strain echocardiography may help to identify cardiac dysfunction at precocious stage in critically ill patients at risk of myocardial depression during a fulminant sepsis. However, the clinical impact of GLS measurement in septic patients remains unclear.

AUTHOR CONTRIBUTIONS

All authors have made substantial contribution to the preparation of this manuscript. JH acquired the images, interpreted the data, and drafted the manuscript. YB performed literature research. PB made critical revision and approved the final manuscript.

ACKNOWLEDGMENTS

We gratefully acknowledge the work of members of our hospital who facilitated this work.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The datasets generated during the current report are available from the corresponding author on reasonable request.

FIGURES 1–3 Three consecutive images of the patient illustrating petechiae on the chest and ecchymotic purpura on the upper and lower limbs

FIGURE 4 Biplane Simpson’s method for calculation of left ventricular ejection fraction (53.4%)
INFORMED CONSENT
Written informed consent was obtained from the patient to publish this report for educational/research purposes in accordance with the journal's patient consent policy.

ORCID
Julien Higny © https://orcid.org/0000-0003-4096-0412

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SUPPORTING INFORMATION
Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Higny J, Bulpa P, Berners Y. Strain echocardiography in a sepsis-induced cardiomyopathy. Clin Case Rep. 2022;10:e06502. doi: 10.1002/ccr3.6502