Care of traditional patients in the campaign against COVID-19: casualties of friendly fire

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ABSTRACT
In response to the COVID-19 pandemic, hospitals have adopted protocols geared to optimize the care of patients with COVID-19, while mitigating risk of exposure to other patients and to health care workers. These modifications can have un-intended consequences and impact the care of non-COVID patients. In the campaign against COVID-19, we must remain vigilant that patients with traditional disease processes also receive thoughtful and coordinated care.

As news of COVID-19 global spread saturated the medical and lay media, an independently living 88-year-old woman, Ms. F, presented to our institution with sudden onset shortness of breath. In recent days, she had experienced intermittent chest pain and had developed abdominal swelling and orthopnea. On admission, she was a slight woman, alert, but hypoxic. A week prior she had noted vague upper respiratory symptoms, and while her chest film suggested pulmonary edema, an infectious process could not be excluded.

With this constellation of symptoms, Ms. F, with what would indisputably be cardiac ailments during ‘peace time’, suddenly became an unknown and even frightening entity, admitted to a service for ‘Persons Under Investigation’ or PUIs, while undergoing testing for COVID-19 infection. The cardiology team followed her as consultants for the alternative diagnosis of decompensated heart failure. Anxious family members were updated on her condition remotely, as policies restricting visitors to hospitals became widely implemented to control spread of the virus.

Alarming reports of the COVID-19 pandemic began feeling close to home in early March in the mid-Atlantic area, where our center is located. Recognizing that safe-guarding the ability to provide care to our patients would require vigilance to prevent provider exposure, our hospital developed modified processes for evaluating COVID-19 positive and suspected patients. Institution of electronic consultation (e-consultation) and avoidance of invasive procedures and imaging in PUIs unless immediate impact on management was expected, included some of the adoptions [1].

Front-line staff caring for Ms. F provided her as personalized and attentive care as could be accomplished, donned in high-level personal protective equipment (PPE), including gloves, gowns, respirator masks, and full face-shields. The cardiology consult team performed an e-consultation, per protocol, and noted left ventricular hypertrophy with anterolateral T wave changes on her electrocardiogram as well as a rise and fall of her Troponin (peaking at 9 ng/mL) and an elevated NT-pro BNP of 5,750 pg/mL. Physical exam findings, as noted by the primary team, were unremarkable, albeit obtained while wearing extensive PPE. Synthesizing these findings, medical treatment for a non-ST elevation myocardial infarction and heart failure was instituted, with cardiac catheterization and echocardiography recommended pending results of her COVID-19 testing. Due to limited testing capabilities in the US, early in the spread of the virus, Ms. F spent five days on a non-cardiology service awaiting COVID-19 results [2]. During this time, she remained hemodynamically stable and improved respiratory-wise.

Ms. F’s COVID-19 test ultimately resulted negative and morning following this, she was referred for cardiac catheterization. As scheduling played out, an echocardiogram was not performed prior to her catheterization procedure – cancellation of elective cases in the cath lab meant inpatient cases were accommodated earlier in the day than typically expected. During her case, while attempting to obtain a left ventricular end-diastolic pressure, the procedural team found that a catheter would not cross the aortic valve into her left ventricle. Further, dense calcification of her aortic valve was noted on fluoroscopy. Together, these findings strongly suggested that a frail elderly woman had arrived in the

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cath lab for an invasive procedure, with undiagnosed critical aortic valve disease.

Angiography was subsequently completed and demonstrated severe right coronary artery and ostial left anterior descending disease. These blockages collectively compromised 70% of the blood supply to her myocardium. Importantly, these lesions were notable for the absence of acute plaque rupture features to explain her Troponin elevation. Her presentation, as pieced together in the cath lab, was one of heart failure in the setting of critical aortic stenosis and concomitant multi-vessel coronary artery disease, a hemodynamic scenario associated with high in-hospital mortality [3]. Consistent with this, Ms. F developed intra-procedural hemodynamic instability, unable to tolerate the challenge of the procedure with her tenuous equilibrium. Placed in the unfavorable position of performing an ad-hoc, high-risk intervention, the interventional team proceeded with an emergent balloon aortic valvuloplasty.

Ms. F initially fared well after intervention, but sadly succumbed later in her hospital stay, affirming the precariousness of her presentation. Determining whether knowledge of her aortic valve disease, noted on a physical exam performed by a specialist, or by an echocardiogram completed earlier in her hospitalization, would have altered her outcome, is impossible. What is troubling, is the manner in which the gravity and complexity of her diagnosis came to light, and that she was not afforded a timely discussion of her poor prognosis.

In the pursuit of optimizing our algorithms to protect staff and patients in the era of COVID-19, we may be blind-sided by the impact of these policies on patients with traditional disease processes. In Ms. F’s management, initial admission to a PUI service made recognition of the complex interplay of her cardiac derangements challenging. PPE introduced difficulties in obtaining a meaningful physical exam and e-consultation meant specialist input was provided without an in-person cardiac evaluation. Delayed echocardiography continued the sequence of events that led to her unfortunate cath lab visit. Cognizance of the holes through which vulnerable patients can slip is important to improve these processes.

Reviewing Ms. F’s case from a systems-improvement perspective led to initiatives to promote the safety of clinicians while providing high-quality care to our patients. Our division obtained a wireless stethoscope to facilitate remote cardiac examination in certain scenarios. Discussions regarding the role of a portable echocardiography device to perform point of care (POC) imaging were entertained. Additionally, our echocardiography lab developed a protocol for focused echo studies to allow selected PUI and COVID-19 patients to undergo urgent echocardiography, while minimizing sonographer exposure. Importantly, awareness and discussion of the complexities of this case was independently an effective intervention in helping clinicians gain perspective in navigating such novel and nuanced scenarios.

As we adapt to a state of chronic COVID-19 census in our hospitals, we must be vigilant that all patients receive thoughtful and coordinated care, and that there are not casualties of friendly fire in the campaign against COVID-19.

Disclosure statement

No relationships with industry or disclosures to report.

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