The decision to use 250 mL of intra-abdominal blood as a cutoff was based on earlier work and experience at our own institution as well as in consultation with radiology colleagues at our institution. You are absolutely correct; 250 mL of intraperitoneal blood will not cause hemorrhagic shock. We chose this volume of blood because, in examining the accuracy of the FAST, we felt that this volume of blood should have been detected by FAST in this more contemporary cohort of patients. This decision was also based on the review of all of our operative reports, which, at times, indicated an approximate volume of hemoperitoneum by the operating surgeon (although, admittedly, not all operative reports attempted this quantification). False-negative FASTs, therefore, were FAST examinations that were reported as negative and, subsequently, were contradicted by findings at laparotomy (regardless of indication) of more than approximately 250 mL of free intraperitoneal blood. The article you cite that found that the mean volume of intraperitoneal fluid detected by FAST was 619 mL was, in fact, performed at our own institution in 1993 and published in 1995.5 We feel comfortable saying that, since that study was published, there have been meaningful improvements to the ultrasonographic technology that we have at our disposal and that the overall comfort and ease with which FAST is performed in our clinical practice has improved. We also acknowledge that this is an area of clinical practice that may benefit from a more contemporary prospective evaluation of current ultrasonographic technology and skill to better describe this technology’s role in evaluating and treating our patients.

The statistical analysis that you performed is interesting and merits more discussion. Likelihood ratios would have been a useful addition to our work, although we would counter that we hold our sensitivity and specificity findings to be correct in our published article. Given that, we calculate the positive likelihood ratio as 44.95 and the negative likelihood ratio as 0.15. By our calculation, this would raise the probability of disease from 12.8% to 87% in FAST-positive patients and reduce the probability of disease to 2% in FAST-negative patients. We are not familiar with the usefulness index, but by our calculation, FAST has a usefulness index of 0.71, which would make it a useful test if we take the cutoff to be 0.35.

You raise an excellent point as to the phrasing of our opening paragraph, which should be better rendered as follows: “It was not until the work by Rozycki et al. in the early 1990s that focused assessment with sonography for trauma (FAST) was described as an integral component of the evaluation of trauma patients in the United States.” [emphasis added] It was in no way our intent to minimize the significant contributions of our international collaborators’ pioneering work in the use of ultrasonographic technology for point of care evaluation; you are correct that, in these very pages, work by a host of other nations that describes and validates the role that ultrasound can and should play in the management and evaluation of critically ill and traumatically injured patients has been published.

We thank you for your thoughtful analysis and close attention to our work and look forward to ongoing discussions as to how best to use FAST and ultrasound in our clinical practice and future research efforts.

DISCLOSURE

The authors declare no conflicts of interests.

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Response to “Changes in traumatic mechanisms of injury in Southern California related to COVID-19: Penetrating trauma as a second pandemic”

To the Editor:

We would like to thank Yeates et al.1 for their timely and valuable publication on changes in traumatic injury patterns in Southern California during the recent pandemic. A similar trend occurred in Texas, where, similar to California, orders to limit social gatherings and visitation of nonessential public locations to mitigate transmission of severe acute respiratory syndrome coronavirus 2 went into effect by Governor’s decree on March 19, 2020.2 However, by the end of June in Texas, stores, restaurants, and other essential services were permitted to reopen to 50% of total occupancy.3 As of March 2021, Texas has been reopened to full capacity.4 Despite the variation in duration of restrictions, a similar variation of injury pattern was noted in the West Texas region.

Our level 1 trauma center provides care for the urban region of Lubbock County, as well as the surrounding rural areas of West Texas and Eastern New Mexico. As the only level 1 center in the region, we are the primary referral source for severe injuries. We evaluated rates of overall trauma, blunt trauma, accidental trauma, assaultive trauma, and self-inflicted trauma in this region during the pandemic and compared these with historic patterns from 2015 to 2019.

Despite overall injury severity scores remaining unchanged in 2020 (χ² [5] = 6.16, p = 0.29, Kruskal-Wallis H test), we discovered a significant increase in all-cause penetrating trauma compared with all-cause blunt trauma: 374 of 2,448 cases (15.28%) in 2020 compared with 1,108 of 12,101 from 2015 to 2019 (p < 0.001, Fisher’s exact test). In addition, over this same period, we found an increase in assaultive penetrating trauma in the urban environment of Lubbock.
Country compared with the surrounding rural communities in 2020: 95 of 175 cases (54.29%) in 2020 compared with 218 of 532 from 2015 to 2019 (p = 0.0028, Fisher’s exact test). Conversely, we found an increase in accidental penetrating trauma within the surrounding rural communities: 100 of 165 cases (60.61%) in 2020 compared with 327 of 453 from 2015 to 2019 (p = 0.0078, Fisher’s exact test).

Similar to the findings of Yeates et al., 1 we found an increased rate of penetrating trauma in 2020, particularly, a significant increase in assaultive penetrating trauma in Lubbock County, relative to the surrounding rural communities. These data suggest that factors unique to the year 2020 may have affected urban communities disproportionately to rural communities. It is possible that regulations around social distancing created a greater negative impact on mental health, social well-being, and cohesion in urban versus rural communities; it is also possible that financial constraints had a different impact in different regions. Variations in injury patterns in 2020 have anecdotally been shared by many trauma centers across the country; compiling these patterns into a snapshot of the pandemic impact may help inform future decisions regarding trauma prevention during a public health crisis.

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Response to Wyatt et al.’s comment on “Changes in traumatic mechanisms of injury in Southern California related to COVID-19: Penetrating trauma as a second pandemic”

We appreciate the response, data, and insights provided by Wyatt et al. Their esteemed Level I trauma center in Texas noted an increase in penetrating trauma rates associated with COVID-19-related restrictions, similar to findings in our multicenter study in Southern California. 1 However, their center notably serves both urban and rural communities, allowing for a unique comparison of pandemic-related changes in trauma between these diverse geographic locations. Their study found that the more urban region of Lubbock County suffered an increase in assaultive penetrating trauma compared with surrounding rural communities, postulating that urban communities may be more affected as a whole by factors unique to 2020. Although prior studies have shown significant increases in penetrating trauma in urban and rural areas separately, the current study describes an important difference in the magnitude of change between two different communities in close proximity. 2–4 Wyatt et al. go on to discuss that this finding may be related to a greater impact of social distancing regulations on urban communities or disparities in financial impacts. Regardless of the cause, we agree that this adds another layer to the discussion regarding the substantial impact this pandemic has had on the preexisting epidemic of penetrating trauma across the country.

We believe future studies should confirm differences in penetrating trauma burden between rural versus urban areas and search deeper to understand the exact underlying risk factors, including social determinants of health, substance abuse, socioeconomic status, and strictness of pandemic-related restrictions. 5 We believe that understanding these subtleties may prove useful to design interventions at the hospital and/or community level to combat the second pandemic of firearm violence.

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