



Analyzing the Potential Risk of COVID-19 Among Traumatic Patients—A Short-Term Observation Study of Trauma Center in Taiwan

Chuan-Sheng Hsu¹, Wai-Hung Chan^{1,2}, Huei-Wen Lai³, Shu-Jung Chuang³, Ting-Yuan Ni¹, Tren-Yi Chen¹, Mu-Kuan Chen^{4,5}, Chu-Chung Chou^{1,5,6}, Po-Yu Wang⁷, Yan-Ren Lin^{1,5,6,*}

¹Department of Emergency and Critical Care Medicine, Changhua Christian Hospital, Changhua, Taiwan

²Department of Trauma Surgery, Changhua Christian Hospital, Changhua, Taiwan

³Center of Infection Prevention and Control, Changhua Christian Hospital, Changhua, Taiwan

⁴Department of Otorhinolaryngology, Head and Neck Surgery, Changhua Christian Hospital, Changhua, Taiwan

⁵School of Medicine, Chung Shan Medical University, Taichung, Taiwan

⁶School of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

⁷Department of Pediatric Emergency, Changhua Christian Children's Hospital, Changhua, Taiwan

To the Editor

Until July 12, 2020, coronavirus disease 2019 (COVID-19) outbreak has infected over 12.8 million people and killed at least 560,000 patients. Most patients (over 80%) presented typical symptoms, including fever, anosmia, dysgeusia, respiratory, or unexplainable gastrointestinal tract symptoms.^{1,2} However, some of them did not present obvious symptoms and might even hide as simple traumatic cases (fall down for COVID-19 related hypoxia or weakness).³

For most emergency departments (EDs), high-risk patients could be identified in fever or even respiratory zones. However, for trauma centers, it would be not easy to evaluate each patient well, especially when facing critical conditions (e.g., massive bleeding, organs exposure, open fracture, or amputations). Of course, in epidemic stage, we agree that each medical personnel in trauma center should wear appropriate personal protective equipment (PPE) and test virus for each suspicious patient. However, for some countries, which are not truly getting in epidemic stage, early consumption may induce resource insufficiency in following epidemic condition. Therefore, should we test virus for each traumatic patient in potential

community infection countries? It poses difficult challenge for both government and ED physicians. Taiwan Centers for Disease Control (CDC) pointed out that non-critical surgery could be postponed until the patients are de-isolation. Critical operations should not be limited but requiring appropriate PPE and negative-pressure room (Fig. 1).

For analyzing the potential risk of COVID-19 among traumatic patients, each patient was evaluated (March 9–31, 2020) in our trauma center (level-1 trauma center in the ED, on duty 24 hours for all surgical related specialists, two negative-pressure operation rooms, average 1,300 visits and handles 40 critical operations per month). The risk of COVID-19 infection was defined as “high” when patients with any travel, occupation, contact, and cluster (TOCC) histories within 14 days (after exposure).⁴ Patients who co-exited with fever or typical symptoms without TOCC were classified as “potential” risk. During this period, total 872 traumatic visits were included. Among them, 13 (1.5%) and 45 (5.2%) patients were classified as high and potential risks, respectively. Each of them was separated and kept their distances in different buffering areas for preventing potential cross/in-hospital infection. In the ED, COVID-19

Received: May 19, 2019; Revised: July 8, 2020; Accepted: July 21, 2020.

*Corresponding author: Yan-Ren Lin, MD, PhD, Department of Emergency and Critical Care Medicine, Changhua Christian Hospital, No. 135, Nanxiao St., Changhua City, Changhua County 500, Taiwan. E-mail: h6213.lac@gmail.com

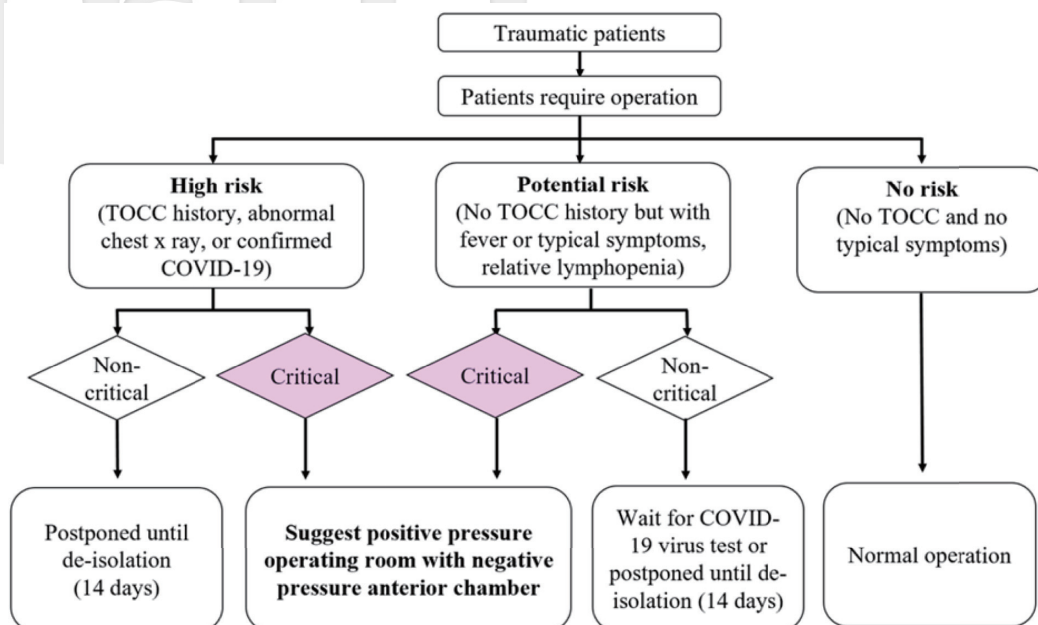


Fig. 1. The flowchart and risk evaluation of traumatic patients is for coronavirus disease 2019 (COVID-19). Each of risk patients was separated and kept their distances in different buffering areas for preventing potential cross/in-hospital infection. Virus test could be provided in the emergency department. Typical symptoms were defining as fever, anosmia, dysgeusia, respiratory, or unexplainable gastrointestinal tract symptoms. Before operation, patients with abnormal chest X-ray (ground-glass opacities or other atypical presentations) should be classified as “high risk” (isolated and treated). In addition, patients with normal white blood cell count and relative lymphopenia should be included in the “potential risk.”

TOCC: travel, occupation, contact, and cluster.

virus tests could be provided. Of all, most patients ($n = 57, 98.2\%$) received simple treatments or examinations (wound managements, portable X-ray, reductions, and immobilizations) without moving to other units. However, only 1 (1.7%) patient received critical operation immediately after suffering severe head trauma. The trauma and ED teams had worn appropriate PPE when handling these patients. Finally, each risk patient was not confirmed as COVID-19 infection. Finally, only 2 high-risk patients had been delayed for their operations after de-isolation (both were non-critical, closed bone fracture). According to their medical records, pain and anxiety might be the most predominant complications of delayed surgery. Therefore, we suggest that effective pain control and depression prevention (e.g., daily telehealth via video or telephone) should be applied for those patients.

In conclusion, risk evaluation for COVID-19 in trauma center is necessary. High risk patients (with TOCC history) should be identified firstly and separated in buffering area. Simple treatments/evaluations could be provided for most risk patients without mov-

ing to other units. Non-critical operations could be scheduled after quarantine. To diagnose COVID-19, reverse transcription polymerase chain reaction (RT-PCR) is the gold standard, but there are some tools assisted with more accurate diagnosed. History (TOCC), symptoms, chest X-ray, and blood tests results are all helpful and mandatory. More importantly, with appropriate PPE and operation room, critical operation should not be delayed.

References

1. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020;395:507-513. doi:10.1016/S0140-6736(20)30211-7
2. Liu YC, Liao CH, Chang CF, Chou CC, Lin YR. A locally transmitted case of SARS-CoV-2 infection in Taiwan. *N Engl J Med* 2020;382:1070-1072. doi:10.1056/NEJMc2001573
3. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan,

China. *Lancet* 2020;395:497-506. doi:10.1016/S0140-6736(20)30183-5

4. Chen TY, Lai HW, Hou IL, et al. Buffer areas in emer-

gency department to handle potential COVID-19 community infection in Taiwan. *Travel Med Infect Dis* 2020;36:101635. doi:10.1016/j.tmaid.2020.101635