

Expert consensus on management principles of orthopedic emergency in the epidemic of coronavirus disease 2019

Pei-Fu Tang¹, Zhi-Yong Hou², Xin-Bao Wu³, Chang-Qing Zhang⁴, Jun-Wen Wang⁵, Xin Xing², Zeng-Wu Shao⁶, Ai-Xi Yu⁷, Gang Wang⁸, Bin Chen⁸, Ping Zhang⁸, Yan-Jun Hu⁸, Bo-Wei Wang⁸, Xiao-Dong Guo⁶, Xin Tang⁹, Dong-Sheng Zhou¹⁰, Fan Liu¹¹, Ai-Mi Chen¹², Kun Zhang¹³, Kai-Nan Li¹⁴, Yan-Bin Zhu²; Orthopedic Trauma Branch of Chinese Orthopedic Association; External Fixation and Limb Reconstruction Branch of Chinese Orthopedic Association; Trauma Expert Committee of Chinese Association of Orthopedic Surgeons

¹Department of Orthopedics, Department of Orthopedics, The First Medical Center, Chinese PLA General Hospital, Beijing 100853, China;

²Emergency Center of Trauma, Third Hospital of Hebei Medical University, Shijiazhuang, Hebei 050051, China;

³Department of Traumatology and Orthopedics, Beijing Jishuitan Hospital, Beijing 100035, China;

⁴Department of Orthopedics, The Sixth People's Hospital Affiliated to Shanghai Jiaotong University, Shanghai 200233, China;

⁵Department of Orthopedics, Wuhan Fourth Hospital, Wuhan, Hubei 430034, China;

⁶Department of Orthopedics, Union Hospital Tongji Medical College Huazhong University of Science and Technology, Wuhan, Hubei 430022, China;

⁷Department of Trauma Microsurgery, Zhongnan Hospital of Wuhan University, Wuhan, Hubei 430071, China;

⁸Department of Orthopedics and Traumatology, Nanfang Hospital, Southern Medical University, Guangzhou, Guangdong 510515, China;

⁹Department of Orthopedics, The First Affiliated Hospital of Dalian Medical University, Dalian, Liaoning 116011, China;

¹⁰Department of Orthopedics, Shandong Provincial Hospital, Jinan, Shandong 25002, China;

¹¹Department of Orthopedics, Affiliated Hospital of Nantong University, Nantong, Jiangsu 226001, China;

¹²Department of Orthopedics, Changzheng Hospital Affiliated to Naval Military Medical University, Shanghai 200003, China;

¹³Department of Orthopedics, Honghui Hospital Affiliated to Medical College of Xi'an Jiaotong University, Xi'an Shaanxi 710054, China;

¹⁴Department of Orthopedics, Affiliated Hospital of Chengdu University, Chengdu, Sichuan 610081, China.

Since December 2019, many patients in Wuhan sustained pneumonia with unknown causes.^[1,2] A part of severe patients developed acute respiratory distress syndrome or septic shock, and even death. On January 7, 2020, Chinese researchers have for the first time detected a new coronavirus. On January 20, 2020, the National Health Commission issued Announcement No. 1 of 2020, which included the new coronavirus pneumonia as a Class B infectious disease, and conducted epidemic prevention and control according to the Class A infectious disease. This new kind of pneumonia has been named coronavirus disease 2019 (COVID-19). The sixth edition of "Diagnosis and Treatment Scheme for New Coronavirus Infected Pneumonia" points out that the main transmission routes include respiratory droplets and close contact transmission. There is a possibility of aerosol transmission in a relatively closed environment with prolonged exposure to

high concentrations of aerosol. New coronavirus pneumonia has a certain incubation period.

Strict measures were adopted across the country to limit the movement and travel of people and strengthen protective measures. The spread of the epidemic was effectively prevented. With the decrease of mobility and travel of people, the number of patients with fractures caused by high-energy trauma is significantly reduced. Meanwhile, low-energy fractures caused by accidental falls at home often occur. Among these patients, there may be close contacts, virus carriers or asymptomatic infected patients. Along with the resumption of work and production, the mobility of the population will increase,

Pei-Fu Tang, Zhi-Yong Hou, and Xin-Bao Wu contributed equally to this article.

Correspondence to: Prof. Bin Yu, Department of Orthopedics and Traumatology, Nanfang Hospital, Southern Medical University, Guangzhou, Guangdong 510515, China

E-Mail: yubinol@163.com

Prof. Bao-Guo Jiang, People's Hospital of Peking University, Beijing 100044, China

E-Mail: jiangbaoguo@vip.sina.com

Prof. Ying-Ze Zhang, Emergency Center of Trauma, Third Hospital of Hebei Medical University, Shijiazhuang, Hebei 050051, China

E-Mail: yzling_liu@163.com.

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and patients suffering from fractures resulted from traffic accidents and work injuries will inevitably increase. This requires orthopedic surgeons to further increase awareness of epidemic prevention and adopt standardized preventive measures for diagnosis and treatment to avoid outbreaks in the hospital. Based on the current situation of epidemic prevention and control in China, the expert group from the Chinese Orthopedic Association and Chinese Association of Orthopedic Surgeons formulated an expert consensus on the diagnosis and treatment of orthopedic emergency surgery during the outbreak of COVID-19, which has been published in the Chinese Journal of Orthopedic Trauma in Chinese [Supplementary file 1 is this consensus statement in English, <http://links.lww.com/CM9/A221>].^[3]

The expert consensus categorized the orthopedic patients into four types. Type I patients had not traveled in the epidemic area within 14 days and had no history of direct or indirect contact with suspected or confirmed cases. Type II patients had a history of direct or indirect contact with people from the epidemic area within 14 days, or patients live in same neighborhoods with suspected or confirmed cases. However, the patients had no clinical symptoms and all examinations were negative. Type III patients are diagnosed as a suspected case of COVID-19. Type IV patients were diagnosed as a confirmed case.

The expert consensus has systematically summarized the epidemic prevention measures during the diagnosis and treatment of orthopedic emergency patients from three aspects: the admission of orthopedic patients, perioperative management and the choice of treatment methods. When admitting orthopedic patients, medical staff should diagnose and treat patients under strict protective measures. In addition to orthopedic specialist evaluation, all patients should be evaluated for the risk of new coronavirus infection and classified into five types according to the standards. Prevention and control measures of infections are carried out in strict accordance with different risk levels. For Type I patients, the medical staff adopt first-level protection measures. For Type II patients, the second-level protection measures should be adopted accordingly. Single ward and specially-assigned medical staff for treatment and nursing is preferred for the kind of patients. Regular review and repeated examinations are suggested to be conducted. The operating room and anesthesiology department staff should be informed about the patient condition. A separate negative pressure operating room should be prepared for operations on type II patients. Two kinds of disinfectants should be used to completely disinfect the operating room after surgery.

In case of fever or respiratory symptoms from type II patients, relevant inspections should be performed in a timely manner. Once the diagnosis of COVID-19 is suspected or confirmed, the patients should be re-classified as type III or IV case. For Type III and IV patients, they should be transferred to the new coronavirus pneumonia designated hospital for treatment. When the specialist assessment does not support transportation of type III and IV patients due to serious injuries and poor conditions, the medical staff should adopt third-level protection measures. Patients also need to wear surgical masks, goggles,

disposable sleeves and socks and avoid direct contact with any stretcher, elevator or other items during the diagnosis and treatment. If the same doctor is responsible for many patients, it is necessary to change the isolation gown, outer gloves, and shoe covers in a timely manner after each patient check to prevent cross infection. For orthopedic emergency patients suspected or confirmed to be infected with the new coronavirus, multidisciplinary collaboration from respiratory department, intensive care unit, and anesthesia department are required to evaluate the patient's general condition and perioperative risks. On the basis of professional protective measures, the proper treatment can be done following orthopedic principles. Manual reduction and brace or plaster fixation can be tried for the majority of traumatic fractures of four extremities. Minimally invasive techniques are also recommended for fracture fixation in a fast fashion.

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Conflicts of interest

None.

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