Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
The pandemic of the new coronavirus infection has swept the world and killed more than 5 million people, which has shocked all human beings who have believed in modern medical progress. Of course, this number of victims is less than plague, the Spanish cold, and AIDS, but its influence and destructive power that has affected socio-economic activities worldwide in such a short period were quite profound. There were many casualties among the medical staff who have worked in hospitals, and there were occasions when the medical system became dysfunctional. Along with the sedation of infections, the balance between restriction and acceleration of socio-economic activities is difficult. With the spread of vaccines and the advent of viral therapeutic agents, we expect how to control this pandemic has finally become visible.

In this situation, we realize that data science and robotics innovations are quite important in many medical fields. Artificial intelligence (AI) diagnosis and remote medical care are becoming a reality, and this direction will accelerate further in 2022, the first year of post-pandemic. The trend of digital transformation (Dx) will also be rushing into Orthopedics next year. In addition, research on virtual reality and augmented reality is being actively conducted, and it has become possible to use it for surgical simulation and technical training. As, in the field of abdominal surgery, remote robotic surgery will soon become available in the field of orthopedics as well.

These Dx trend will prevail to our field instead of experience, and knowledge of medicine, which can change the medical care style dramatically in near future. It is crucial for orthopedic surgeons to always aim for its development and evolution.

© 2021 The Japanese Orthopaedic Association. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Of course, the wave of digitalization has already been coming into the operating room. Navigation is already routinely used in spinal surgery, allowing for the safe installation of screws. Recently, navigation has come to be used for the correction of severe deformation and bone resection in joint surgery. In addition, robot-assisted surgery is also available for joint diseases. So far, it has only a function to assist the osteotomy, but it appears that it will be possible to do this by itself with electric equipment in the future. In addition, research on virtual reality and augmented reality is being actively conducted, and it has become possible to use it for surgical simulation and technical training. As, in the field of abdominal surgery, remote robotic surgery will soon become a reality in the field of orthopedics as well.

In orthopedic education, craftsmanship and profound experience have traditionally been emphasized in the manual reduction for fractures and cast fixation. In addition, in radiological image tests, the practice has been enthusiastically conducted to interpret and reconstruct from two-dimensional images into three dimensions in mind. However, the development of medical AI can bring new aspects that reduce these kinds of training, experience, and knowledge. Advances of digitization in medical fields have the strong power to change the style of medical care itself. It is crucial for orthopedics to always aim for its development and evolution.

Conflicts of interest

None.

Atsushi Okawa
Department of Orthopedic and Spinal Surgery, Tokyo Medical and Dental University, 1-5-45, Yushima, Bunkyo-ku, Tokyo, 113-8519, Japan
E-mail address: okawa.orth@tmd.ac.jp.

9 December 2021
Available online 17 December 2021