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Application model of reading the medical images from the National Health Insurance (NHI) MediCloud System for clinic dentists: A case report

KEYWORDS
MediCloud System;
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Dentist;
Medical image;
Medical safety

In Taiwan, people have convenient and free access to the medical care under the National Health Insurance (NHI). Many people are used to going to different hospitals or clinics for treatments according to different symptoms. Therefore, personal medical and medication information is scattered in different medical institutions. Because clinicians (including dentists) do not have complete information of their patients, there is a risk of duplicate prescriptions or examinations. This in turn affects the safety of the patients' medication. Initially, in order to improve the quality of medical care and medication for the public, in 2013, the NHI Administration combined the cloud computing technology to build a patient-centered cloud medication history database. In 2016, it was upgraded to the NHI MediCloud System, integrating the patients' medical information in different institutions on the same platform and providing clinicians in various institutions with the function to query the patients' recent medical and medication records through the Internet when conducting clinical treatment and prescribing the drugs, so as to ensure the safety of medication for the public. Due to the continuous expansion of the system functions, in addition to medication records and clinical examination records and results, the system can now also provide surgical details, dental treatment and surgery records, allergy records, specific controlled drug medication records, specific medication records of anticoagulants, rehabilitation medical records, discharge medical records, and Centers for Disease Control (CDC) vaccination information. In addition, from 2018, clinicians can also access the medical images such as computed tomography (CT), magnetic resonance imaging (MRI), and dental panoramic radiography images from this system to assist in diagnosis. This system can also help the patients to save time and money for getting medical images.[1,2] The query function of this system has become the most advantageous assessment tool for the patients' medical safety and health status for clinic dentists. This article reported a case on the application model of reading the medical images from the NHI MediCloud System for clinic dentists.

The architecture of this application model is shown in Fig. 1A. A 44-year-old male patient came to a local dental clinic for evaluation of dental implant surgery. Six months ago, he had visited a regional hospital for bilateral submandibular area swelling. Therefore, the dentist read his recent medical records through the NHI MediCloud System (Fig. 1B and C). The system showed that he had a CT scan in the previous hospital. The dentist read his CT images and report (Fig. 1D). The report showed that there was no

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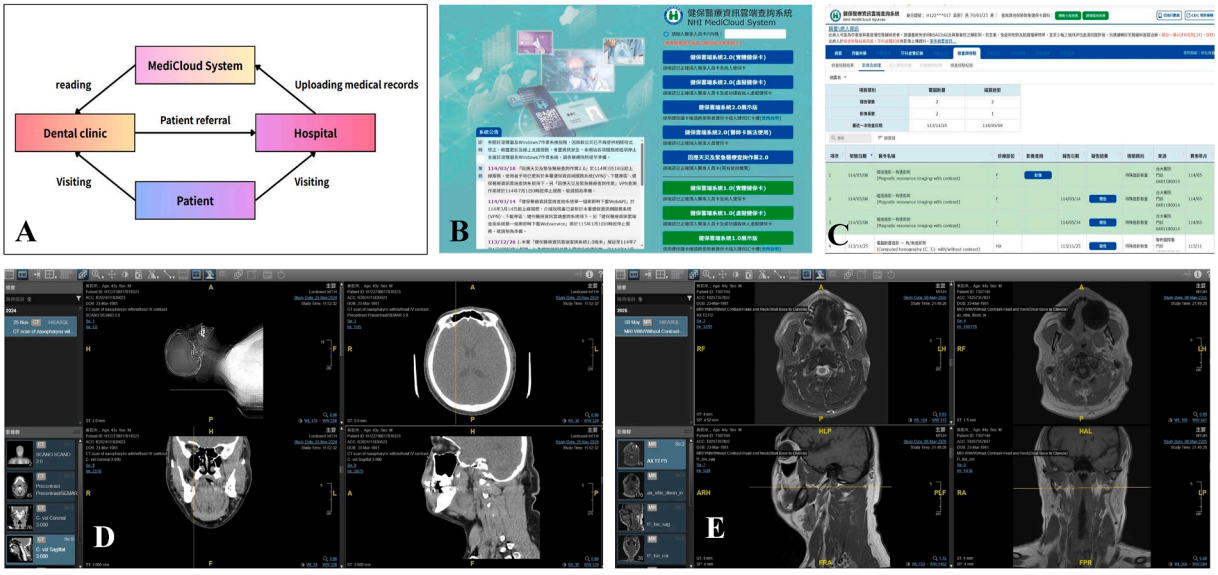

Figure 1 Application model of reading the medical images from the National Health Insurance (NHI) MediCloud System for clinic dentists. (A) The architecture of this application model was demonstrated in this case report. (B) The main computer of the dental clinic can be connected to the home page of the NHI MediCloud System. (C) When this patient visited the dental clinic for treatment, the dentist could check his medical records through the NHI MediCloud System. (D) The dentist could read his computed tomography (CT) images and reports produced by other hospitals. (E) The dentist could also read his magnetic resonance imaging (MRI) images and reports produced by other hospitals.

definite mass lesion over the submental region, and the right palatine tonsil was calcified and suspected of having tonsillolith. The nasal septum was deviated to the left side. However, during the pre-surgery evaluation, the patient still complained of increased saliva secretion, numbness at the base of tongue, loss of taste at the dorsal tongue, and the submental area swelling. The dentist could feel a movable mass over the submental area when performing palpation. Based on the patient's medical safety, the dentist decided to postpone the dental implant surgery and referred the patient to a medical center for further examination. The patient then underwent an MRI examination in the hospital (Fig. 1E). The report revealed that there was no definite tongue lesion. The submandibular and parotid glands were nearly normal. There was no definite neck and supraclavicular lymphadenopathy. The bilateral paranasal sinuses were basically unobstructed. Based on the medical history taking, the oral and cervical physical examinations, and the results of CT scan and MRI examination on the NHI MediCloud System, the dentist determined that there was no doubt about the safety of this patient undergoing oral surgery. Therefore, the dental implant surgery was performed according to the original treatment plan and completed successfully.

Medical safety is always a priority for any clinician before performing treatment or surgery on a patient.[2–4] A complete medical safety assessment for the patients may require different types of testing equipment and methods. For clinic dentists, the advanced testing equipment (such as CT and MRI) is not readily available. However, the patients' medical safety and health status involves a systematic assessment of the whole body outside the oral cavity. At this time, as in this case, the NHI MediCloud System becomes the most advantageous assessment tool for getting whole body medical information. Especially in the oral surgery that does not involve emergency medical care (such as tooth extraction or dental implant surgery), the patients' medical safety should be carefully assessed in advance. Through the use of the NHI MediCloud System and the convenience of obtaining medical treatment information, clinic dentists' assessment tools are extended to the testing equipment of all hospitals in Taiwan. The use of the NHI MediCloud System has become one of the characteristics of dental services in Taiwan. Moreover, in addition to the diagnosis and treatment of oral diseases, our previous research emphasized that dentists also play a certain role in finding and diagnosing the head and neck lesions for their patients.[5] The use of the NHI MediCloud System can help to play a role in this regard.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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