●遺体の身元確認における Ai画像の役割

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　遺体の身元確認にはさまざまな手法があり、遺体の状況や対照資料の入手可能性を考慮して選択・適用される。Ai画像を用いた頭蓋-顔画像スーパーインポーズ法や生前医療画像との異同識別法は迅速・正確に個人を特定できるため、今後の普及が期待されている。これら手法の詳細と今後なすべき取り組みについて述べる。

　Personal identification of deceased bodies including the victims of mass disaster is the one of the most important police activities. Comparisons of face, fingerprint and dental record between those in antemortem and postmortem are conventionally used methods for personal identification. In addition to them, DNA typing became popular for the victim identification of mass disaster in recent years. The applicability of each identification method strongly depends on the condition of deceased body and possibility to obtain reference materials. Particularly, the DNA typing is strongly affected by the kinship of the person providing the reference DNA. The power of personal identification became quite low in some situations, for example, samples from the ones in brother and sisterhood. Face and fingerprints lose their original shapes rapidly in degradation so that these are applicable for the personal identification only in the early phase after the death. Based on the above, we should choose appropriate identification methods on a case-by-case basis in caseworks.

　In parallel with recent popularization of Autopsy imaging (Ai), the number of the personal identification established with it is increasing. The CT images obtained in the Ai (Ai-CT) can be used in a cranio-facial superimposing method that establish the link between the skull shape and the antemortem facial images of the candidate of the deceased body. Also, the Ai-CT images can be used for comparisons with antemortem X-ray images including CT taken in hospital. Bone shapes of the Ai-CT are compared with those included in antemortem X-ray images, by chance in some cases.

　Since the Ai-CT imaging is performed with high numbers of CT slices, its DICOM data is enough applicable to the MPR imaging which produce the slices virtually in any angle. The slices equal to the antemortem slices in angle can be prepared for the comparison. For examples, the head CT slice taken in diagnostic can be compared with the adjusted MPR image of Ai-CT image with focusing on the complicated shape in the mastoid cells. Such focusing points for comparisons are dependent on the area taken in diagnostic (antemortem) X-ray image. High numbers of slices in Ai-CT also contribute to produce the high-quality 3D bone surficial shapes in volume rendering. The 3D shape of postmortem bone can be adjusted to antemortem image in view angle by rotating. As an example, the comparison between the antemortem X-ray image of bone fracture and the postmortem 3D shape of healed fracture is introduced in this article. In any case, it is impossible to take antemortem X-ray image with deceased body. The limited numbers of X-ray images taken in life for the diagnosis taken under unique conditions are all we can use for the personal identification. Ai-CT image enables us to make comparison in such a restricted condition with its high resolution.

　In order to enhance the activity of personal identification with Ai-CT images, we have proposed the installation of the system composed of several kinds of software including a DICOM viewer for forensic laboratories located in every police headquarters. In 2020, the system was installed in forty-seven forensic laboratories (in every prefecture), and these laboratories are now in charge of the personal identification with Ai-CT images. The National Research Institute of Police Science has a training institute of forensic science. The training of the identification methods is ongoing for the staffs of prefectural forensic laboratory at this institute.

　To forwarding the identification with Ai-CT imaging, it is very important to put police officers on notice of the effects of this method because the efforts of police officer to collect antemortem medical images are essential. Educations in what kind of medical image are needed, what format are preferred, and how to collect them are required to operate the identification effectively. We give a lecture regarding them to police officers whenever opportunity offered. Finally, we would like to ask medical doctors and technical staffs who are engaged in Ai to keep collaborations with us. By exchanging the information of each field, quality and efficiency of this collaborative mission must increase.