

Medical imaging techniques as tools for the study of forensic clinical anatomy

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The last decades have been characterized by a growing interest in the field of imaging techniques for the study of the anatomy of human body. This is a fundamental concept since it is not only interesting to anatomical theory but also useful to clinical medicine, especially in the field of surgery. In this work, we demonstrate that advanced medical imaging techniques may play a major role in forensic clinical anatomy, especially for the evaluation of iatrogenic and non-iatrogenic lesions. Here in, we evaluate the usefulness of CT- and MR-based direct volume rendering reconstruction [1] and tractography [2] for the study of: i) medial rectus lesion; ii) oro-antral fistulas; iii) dislocation of dental implants; iv) brain injuries. Our results, which improve the conventional three-dimensional images, reveal a new avenue of research studies and clinical fields, mostly in anatomy. Computer-assisted, model-based procedures typically cover specific modifications of virtual anatomy as well as numeric simulations of associated phenomena, like mechanical loads or diffusion processes, in order to evaluate potential therapeutic and post-operative outcomes. In the future, a combined approach of these advanced tools with other radiological techniques may lead to an imaging data set with unsurpassable anatomical, physiological and pathological information, offering unique advantages in the forensic science field.

References

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Keywords

Direct volume rendering; MRI; CT.