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Augmented Reality in Surgical Oncology. A Literature Review

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Abstract

Introduction: Augmented reality (AR) devices enable doctors to associate visualizing diagnostic data, to establish therapeutic procedures in order to improve work efficiency and safety and to develop the surgical training of young doctors. This new approach may contribute to an increase in the quality of medical training and a decrease in the costs of surgeries. This paper assesses whether augmented reality can improve the results of surgical procedures as well as its possible progress in the future.

Methods and Results: The intra-operative use of augmented reality by using Google Glass glasses, on which we projected MRI/CT images of the anatomical areas invaded by tumors and/or images of normal anatomy, helps us to perform surgeries, as well as to present them as teaching material. We have also performed a review of the available literature, beginning with 2011 and ending with November 2021, by looking up the terms "augmented reality" and "surgical oncology" in PubMed. The results of the search were 308 studies in this field which prove the utility of the method. Many papers show that the performance of the augmented reality systems is superior and compatible with traditional imaging techniques.

Conclusions: The specialty literature reveals a growing interest on the part of surgeons regarding the use of augmented reality during surgery. This procedure enables the improvement of the safety and efficiency of surgical techniques, as well as their presentation to students and residents alike. The method is innovative and has to be carefully approached before being introduced into routine practice.

Key words: augmented reality, surgical oncology, radiofrequency ablation, medical education