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Software for cataloging and identification of dental implants: A powerful tool for recognition and forensic identification purposes

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Abstract

In recent years, with the increasing use of dental implants for prosthetic rehabilitation therapy, and given the multitude of types of implants, it has been thought to use the different shapes, types and lengths for personal identification purposes. The idea of analyzing and comparing the shape of implants is made possible by information and communication technology, i.e. the set of technologies that enable you to process and communicate information through digital means, and through mathematical algorithms of recognition highly complex that are the result of years of study. Everything is easily accessible through a web portal (www.which-implant.com)

Materials: A series of software operating on radiographs through identification of edges has been developed, recognition of the structural elements of binary images, identification of graphs needed to determine with accuracy the outer edge of the shapes, and calculating the geometrical parameters, such as the center of gravity and orientation. Once obtained the geometry of the implant, such data are compared with those stored in a database or with data obtained from another X-ray instrument.

Expected results: Given a X-ray showing an implant and the database of the web portal, the algorithm determines which database model matches better the implant of the x-ray, indicating the percentage of success of the matching with mathematical certainty. Given two X-rays showing two implants, the algorithm says with mathematical certainty expressed as a percentage, if such implants are matching.

Discussion: The analysis of the implants inserted into the bone structure is a non-invasive technique, useful for identification both in the living and the dead. The material to be analyzed is maintained unchanged due to the position within the bone and to the type of material: titanium. The recognition system is valid for personal identification purposes, both of reconstructive and comparative type (forensic). It could also be useful in case of mass disasters for a fast screening.