F11 Implantation of an RFID Tag Into Human Molars Reduces Hard Forensic Identification Labor: Part 2 - Resistance of the Modified and Implanted RFID Tag Against Pressure and Temperature Fluctuations

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Attendees will learn that RFID tags implanted in human teeth for identification purposes resist high pressure and temperatures. This presentation will impact the forensic community by demonstrating how the use of RFID tags in human molars for identification purposes withstand chewing pressures and varying temperature settings.

In the previous presentation the possibility of using a commercial RFID tag as a properly working device for human forensic purposes was explained. It was found that disassembling and implanting commercial RFID-tags in human molars was practically feasible and resulted in a properly working set-up.

If used as a forensic identification device , the implanted RFID tag has to be resistant against the normal oral pressure - and temperature fluctuations and against extreme pressure and temperature rises. Maximal vertical occlusal load on which the implanted ID-tags kept their readout activity was investigated. The test revealed that, in vitro, the system can stand forces higher than the maximal human chewing force. Fatigue was induced on the implanted samples by thermocycling. The results of this examination opened the discussion of putting an extra isolating layer on the modified ID-tags before implantation. The behavior of the implanted ID-tags during extreme high temperatures was inquired in a temperature test. The maximal read-out temperature of the integrated tags was detected.

The conclusion of these tests was that the modified and implanted RFID tag resists fatigue and can stand maximal human chewing forces and extreme temperatures. Further research and tests are needed in order to optimize the design and stability of these RFID-tags and their interrogator and to detect the physical properties of the system for human identification purposes.

Radio Frequency Identification Tag, Thermocycling, Chewing Pressure

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