

Researchers develop new technology for user friendly and affordable tooth implants

Going to a dentist is always considered to be a costly affair. A new development by Indian scientists promises to change this. A group of researchers from Indian Institute of Technology (IIT Delhi) and Maulana Azad Institute of Dental Sciences (MAIDS) have developed a new technology for dental implants which they say would be user-friendly and affordable solution for treatment of missing tooth. These implants can work for all kind of conditions like single or multiple missing teeth and even for providing full denture.

“It took us ten years to come up with this technology. We have learnt to make it to the best of perfections, tolerances and fits. The implants that are imported are expensive and the companies making them are unwilling to share the technology so we have made indigenous implants “ said Prof Naresh Bhatnagar, researcher, IIT Delhi.



Dental implants and their assembly

The researchers studied a range of anthropometry in India based on which they developed the implants. The design was based on the premise of minimum stress generation during the insertion of threaded titanium implant. For every diameter, the abutment size is different and they all have different screws. So the researchers had to make a multi-functional component.

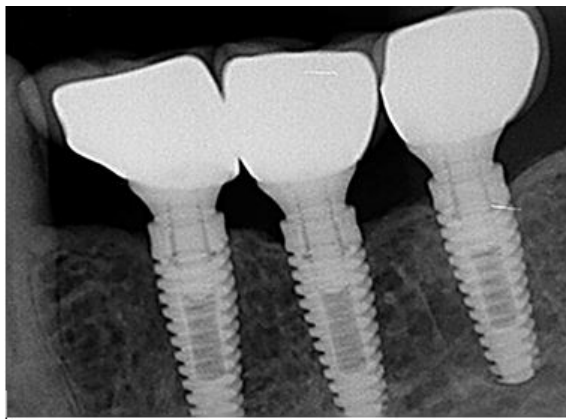
The innovations include the use of same prosthetic platform for all implant integrated platform switching and the development of a single component which serves as implant mount, implant impression transfer coping, implant impression pickup coping (with long screw) and as the final straight abutment. The surface treatment for the implant was developed with a combination of grit blasting and acid etching for better Osseointegration of the implant with the surrounding bone.



Surgical and Prosthetic kit box for the Dental Implantation

The biological efficacy and safety of the implant was tested in animals and results were verified with micro CT analysis and Histomorphometry at Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Thiruvanthapuram and at Shriram Institute for Industrial Research, Delhi. An initial clinical test of the implant has been done at MAIDS in single tooth implant cases. The implant has been tested in 150 patients.

“The success rate was 92 per cent. These tests were done after all due ethical and regulatory clearances. We have also set up a manufacturing lab in IIT Delhi,” told Dr Bhatnagar.



A kit containing all types of surgical drills and components together with universal prosthetic components has also been developed. It consists of all the necessary machinery, molds, tools, jigs and fixtures were designed and developed, even for packaging, cleaning and sterilization, so that it becomes easy and comfortable for surgeons to deploy the implant with no-touch and use the system on patients for maximum success.

The manufacturing and cleaning facility was set up at Nano Research Facility (NRF) at IIT Delhi for the project and IIT Delhi obtained drug license as test manufacturing Unit for Dental

implants for R&D purpose and for clinical trial from Delhi State Licensing Authority. More than 500 implants for the purpose of trial were manufactured in the IIT D facility till date.

The project was funded by Council of Scientific and Industrial Research.

Keywords: tooth implants, affordable, IIT Delhi, CSIR