

3D PRINTING IN FORENSIC ODONTOLOGY

Aman Chowdhry

*Associate Prof,
Department of Oral Pathology, Faculty of Dentistry,
Jamia Millia Islamia, New Delhi*

** Corresponding author: achowdhry@jmi.ac.in*

ABSTRACT

This letter highlights why and how forensic odontologist should keep abreast of advances in 3D printing. This letter will make them aware that this technology exists so that array of new prospects it opens can be explored.

Key Words: Stereolithography, Forensic odontology, Forensic 3D printing.

Dear Editor,

Since the invention of 3D printers in 1984 by Charles W. Hull (U.S. Patent 4,575,330), the technology has come a long way ever since then. Many companies are providing small, at-home 3D printers for amateurish usage. Advanced professional printers are available, which allow usage of variety of materials with improved color choices and surface finishes. Presently 3D printing is being used in various fields of science and its application has ranged from automobile industry to medical equipment and artificial organs.¹

The use of 3D printing in forensic disciplines is still relatively new-fangled. On very few occasions this technology has been utilized for forensic cases / experiments^{2,3}. It's surprising why more scientists, lawyers, and expert witnesses haven't been benefited of 3D printing by its use in court. The reason for this can be due lack of understanding or costing involved.

3D Printing in dentistry:

Application of 3D printing in dentistry has been highlighted by A Dawood in 2015¹. Employments of 3D printing in dentistry incorporate:⁴

1. Generation of bore guides for dental implants
2. Creation of physical models for dental specialities (like prosthodontics, orthodontics and oral surgery)
3. Make of dental, craniomaxillofacial and orthopedic implants
4. Fabrication of copings and frameworks for implant and dental restorations.

3D Printing in forensic dentistry:

3D printing can have its usage in forensic odontology including: facial reconstruction and identification, bitemark analysis, lip printing and rugoscopy etc. Thus their application can be utilized for solving crimes and presenting evidence to court.

Road ahead:

Gross BC 2014 have tabulated and compared various types of 3D printers (Stereolithography, inkjet, Selective Laser Sintering, Fused Deposition Modeling, or Laminated Object Manufacturing), which can be help selecting an appropriate 3D printer⁵. After careful appraisal the authors anticipate that this exhilarating novel technology will lead to new opportunities of research is forensic odontology. 3D models of teeth / bones / facial approximations / bite marks / lip prints / rugae etc may be useful

to forensic odontologists in civil and criminal matters for both analysis and as exhibits in evidence. This will affix a new facet to the clarity of communiqué in the courtroom.

The costs are falling as this technology is being utilized in many other fields. The setup involved in 3D printing is improving by providing a better resolution and improved software. All this is likely to ease the making of models and enhance the quality of the products. For forensic odontologist it is important to keep abreast of advances and should be aware that this technology exists so that array of new prospects it opens can be explored.

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