



### F6 Bitemarks in Perishables: 3D Laser Scanner Analysis

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After attending this presentation, attendees will understand how new technologies, especially laser scanner 3D modeling of dental casts, can enhance the study of bitemarks. The sectioning performed allows an approach to further development in the study of bitemarks to help investigators and magistrates to identify the perpetrators of such injuries.

This presentation will impact the forensic science community by showing how this photographic technique provides a reliable system to use in the field or laboratory. It has been tested within the Forensic Science Institute of the French Gendarmerie (I.R.C.G.N). The practical applications presented can be used as a guideline to forensic odontologists.

In 1997, C. Georget and W. Baston compared experimentally produced bitemarks left in food with the dental casts of two suspects.

The pieces subjected to analysis were: (1) a piece of cheese with bitemarks; and, (2) study models of maxillary and mandible dental arches of two suspects.

The first step is to make a molding to duplicate the shape of the bitten substrate. The cast of the impression is then made of resin (resin INTERIM CD / SPAD) and is duplicated.

The observation of cast supporting bitemarks objectives evidence of marks indentations, the traces left on the edge of the food, tearing the material. The cast also specifies the dynamics of the bite (lateral movement and slippage) specific to the individual who has bitten. The meeting point between the upper and lower teeth are visible in the form of a bead. This observation also helps to identify the visible teeth on the food. The shape of the teeth can give the orientation of the object in the mouth.

In 2011, Georget and Conigliaro repeat the previous studies.

The contribution of new technologies and especially the use of laser scanners assist in the production of fast and easy 3D models of the dental casts and perishable substance.

The use of a 3D laser scanner has advantages. The print is done without any risk of deformation due to the pressure of a conventional impression material on the perishable substance. Furthermore, as no impression material is used there is no risk of the material tearing. The average ambient temperature of the enclosure of the scanner is 22°C (74°F). This temperature does not alter the sample to be analyzed during the impression taking. In extreme cases, a fragile sample can be placed on a refrigerated pedestal. The shape of the food is preserved.

This non-destructive method enables the production of sections according to the needs of the forensic odontologist. The digitalized dental cast is available for further examination due to the non-destructive nature of the methodology.

**Bitemark, Perishable, Noninvasive Analyze**