Lip prints: Role in forensic odontology

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ABSTRACT

Identification plays a major role in any crime investigation. The pattern of wrinkles on the lips has individual characteristics like fingerprints. Cheiloscopy is a forensic investigation technique that deals with identification of humans based on lips traces. In the past decades, lip-print studies attracted the attention of many scientists as a new tool for human identification in both civil and criminal issues. The lip crease pattern is on the vermilion border of the lip, which is quite mobile and lip prints may vary in appearance according to the pressure, direction and method used in making the print. It concludes by enlightening the readers with the fact that the possibilities to use the red part of lips to identify a human being are wider than it is commonly thought.

KEY WORDS: Cheiloscopy, criminal issues, lip prints, lips traces

The challenges faced by man in early days to provide the identity of an individual. Identification of humans is prerequisite for personal, social and legal reason. The invention of finger print in the past century is the only reliable means of human identification.[1] In individuals, the finger print patterns are distinctive and permanent and hence considered as a tool for identification.[2] However, the awareness of the advanced techniques in crime detection has alarmed the criminals for taking sufficient precautions like the use of gloves.[3] In such circumstances, the identification of criminal using accurate methods like fingerprint analysis fail to establish a positive identity. Thus investigator can rely on adjuvant technique such as cheiloscopy as supportive evidence.[2]

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The pattern of wrinkles on the lips has individual characteristics as fingerprints. The wrinkles and grooves on the labial mucosa (called sulci labiorum) form a characteristic pattern called lip prints, the study of which is referred to as Cheiloscopy.[4] It can be defined "as a method of identification of a person based on characteristic arrangements of lines appearing on the red part of lips or as a science dealing with lines appearing on red part of the lips".[2]

The lip prints being uniform throughout the life and characteristics of person can be used to verify the presence or absence of a person from the crime, provided there has been consumption of beverages, drinks, usage of cloth, tissues or napkin etc., at the crime scene.[5] However, studying in depth and establishing further facts and truth in lip prints will certainly help as useful evidence in forensic dentistry.

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History

The biological phenomenon of systems of furrows on the red part of human lips was first noted by anthropologists; R. Fischer was the first to describe it in 1902.[6] In 1932, one of the France's greatest criminologist Edmond Locard, recommended the use of lip print for identification of a person.[7] The idea of using lip print for identification was first suggested by Le Moyne Snyder in the year 1950. He introduced a case in which lip prints helped the crime scientist in an unusual way.[2] Dr. Martins Santos in 1960 proposed that these lip characteristics could be used in personal identification and devised a simple system for classifying lip prints.[2]

In 1967, Suzuki made a detail investigation of the measurement of lips, the use and the color of rouge and method of its extraction to obtain useful data for forensic application.[8] Later in 1971 Suzuki and Tsuchihashi, conducted a study and they devised their own classification.[2] Mc Donell in 1972 conducted a study on lip prints between two identical twins and reported that two identical twins seemed to be indistinguishable by every other means but they had different lip prints.[8]

Cottone in 1981, reported in his book Outline of Forensic Dentistry, that cheiloscopy is one of the special techniques used for personal identification.[8] In 1990, Kasprzak conducted research for the period of 5 years on 1500 persons to elaborate the practical use of lip prints.[6] It was during the period 2000-2012 that the study was carried out by several researchers from other countries and also in India. Different aspect of lip prints like stability, morphological patterns and sex determination among different groups of population. So all this research suggesting that the cheiloscopy can be used as an adjuvant technique in identification.[2]

Classification

In 1967 Santos[9] was the first person to classify lip grooves. He divided them in to four types namely:

1. Straight line
2. Curved line
3. Angled line
4. Sine-shaped line

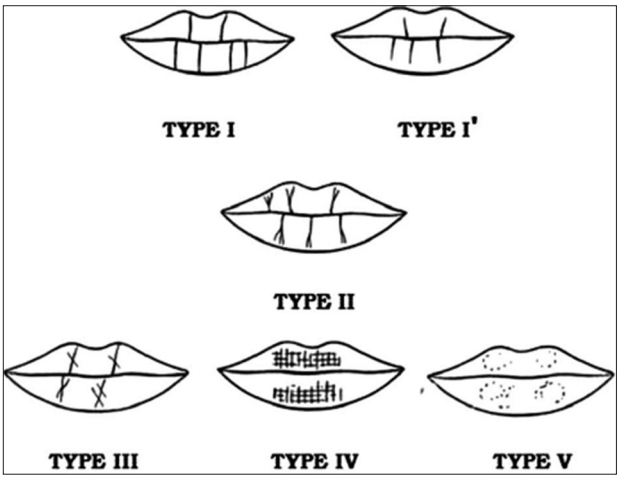


Figure 1: Suzuki and Tsuchihashi classification

Suzuki and Tsuchihashi, in 1970,[10] devised a classification [Figure 1] method of lip prints, which follows:

1. Type I: A clear-cut groove running vertically across the lip.
2. Type I': Partial-length groove of Type I.
3. Type II: A Branched groove.
4. Type III: An intersected groove.
5. Type IV: A Reticular pattern
6. Type V: Other patterns.

This classification is the most commonly used for recording the pattern on the lips.

Recording lip prints

Lip prints can be recorded in a number of ways.

1. Photographing the suspect's lips.[11]
2. On a non-porous flat surface such as a mirror they can be photographed, enlarged and overlay tracings made of the grooves.[12]
3. Applying lipstick, lip rouge, or other suitable transfer mediums to the lips and then having the individual press his or her lips to a piece of paper or cellophane tape or similar surface.[11]
4. Using a finger printer, preferably a roller finger printer.[13]
5. By having the subject impress his or her lips (without lipstick or other recording medium) against a suitable surface and then processing these prints with either conventional finger print developing powder or with a magna brush and magnetic powder.[11]

Processing and Developing of the Lip Prints

Provided the lip print is left on a suitable medium it can be developed using a number of different powders or cyanoacrylate and photographed.[14] The powders used are the same as for fingerprint development and the latent lip prints must be dry.[15]

Basic latent print dusting

For many crime scene investigators, more than half of the powder they use is regular, nonmagnetic powder. It can be used on windows, counter-tops, television sets and many other items moved or touched at residential burglary scenes. At commercial burglary scenes, it can be used on metal file cabinets, painted doors, broken glass and metal window frames.[13] Regular powders are available in colors such as black, silver/gray, Bichromatic and white. Proper color is chosen to provide sufficient contrast with the background surface if a clear photograph of the latent print has to be obtained.[13]

Developing the Latent Lip Prints

To record lip prints using the magna brush method, the person

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should impress his or her lips against a glossy porous surface or a smooth nonporous surface.[16] These lip prints should then be subjected to a heat source until they solidify or should be allowed to air dry. These prints should then be powdered using a magna brush and magnetic powder. Conventional powder methods are usually unsuitable for powdering lip prints, inasmuch as the brush tends to smear or leave streak marks on the print. These streaks may then be interpreted as false characteristics by the comparer. These magnetic powders and magna brush are costly as compared to that of conventional powders.[13]

Lip Print in Crime Detection

Just like finger print and teeth, lip print can be used as tool for identification. Lip prints are unique and do not change during life of a person.[16] Traces of lips should be looked for on cutlery and crockery items, on the window or door glass and on photograph or letters. Lip print may also appear on side by side with tooth marks on food products. In practice, lip prints have also seen in the windows, painting, doors, plastic bags and cigarette ends.[2] They can be most frequently seen during murders, rapes and burglaries. Traces with clear lines and individual elements enable individual identification of human beings. In a sense, lip prints have the same value as dactyloscopic traces. In the case of traces, in the shape of strains the identification examination terminates with group identification; in their character they are similar to other chemical and biological traces.[6]

Lip Print in Court

On May 12, 1999,[1] an Illinois appellate court accepted, in people versus Davis, No 2-97-0725, the uncontroverted testimony of two state police expert (a finger print examiner and a questioned document examiner) that:

1. Lip print identification is generally acceptable within the forensic science community as a means of positive identification because it appears in the literature.
2. Lip print identification methodology, although seldom used is very similar to finger print comparison and is known and accepted form of scientific comparison.
3. There is no dissent in the forensic science community with regards to either the methodology used or fact that lip prints provide a positive identification.
4. The Federal bureau of investigation (FBI) and the Illinois state police consider that lip prints are unique like finger prints and are positive means of identification.[13]

Conclusion

Along with other traditional method, cheiloscopy can also serve as a very important tool in identification of a person. The uniqueness of lip print needed to be conformed and accepted. A standard and uniform procedure has to be developed for the collection, development and recording of lip prints and the ensuring comparison.

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