Lip prints: An Overview in Forensic Dentistry

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Abstract:

Introduction: Establishing a person’s identity can be a very difficult process. Dental, fingerprint and DNA comparisons are probably the most common techniques used in this context. However there are many well-known implanted methods of human identification, one of the most interesting emerging methods of human identification which originates from the criminal and forensic practice, is human lips recognition. Historical Background: 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. Use of lip prints in personal identification was first recommended in France by Edmond Locard. Conclusion: Apart from identifying and evidential use, lip prints may also be used in detection work, being the source of criminalistic information. A lip print at the scene of a crime can be a basis for conclusions as to the character of the event, the number of the people involved, sexe, cosmetics used, habits, occupational traits, and the pathological changes of lips themselves.

Keywords: Lip anatomy, forensic identification, Forensic dentistry.

Introduction: With the ever-increasing demands placed upon law enforcement to provide sufficient physical evidence linking a perpetrator to a crime, it makes sense to utilize any type of physical characteristic to identify a suspect of an offense. Establishing a person's identity can be a very difficult process. Dental, fingerprint and DNA comparisons are probably the most common techniques used in this context, allowing fast and secure identification processes. However, since they cannot always be used, sometimes it is necessary to apply different and less known techniques.

From time to time, shed light on questions of civil and criminal law. Civil cases range from single malpractice suits to mass disaster insurance claims. Criminal cases involve identification both of murder victims and of suspects. Latent or chance impressions located on smooth surfaces are encountered in a majority of the investigations which require comparative analysis. These impressions may arise from a number of sources, the most frequently encountered being impressions of areas of skin bearing friction ridges, predominantly those from the fingers. The possibility of impressions arising from an area of the skin devoid of friction ridges has been noted. Cases in which impressions devoid of friction ridges have been used for evidential purposes, have primarily involved lip impressions. Lip prints have been with us since the beginning of man. Similar to the prints on a person’s finger, palm and foot in that individual characteristic are used for identification, unlike fingerprints however lips also possess furrows that can be classified into various types for identification purposes, though lip prints have not been as popular.

Biometrical methods of human identification have gained much attention recently, mainly because they easily deal with most problems of traditional identification are identified in biometrics human identification systems users are identified by who they are, not by something they have to remember or carry with them.

There are many well known implanted methods of human identification, one of the most interesting emerging method of human identification which originates from the criminal and forensic practice, is human lip recognition. Lip prints are unique and do not change during the life of a person. The external surface of lip has numerous elevations and depressions that form a characteristic pattern, referred to as lip prints, lip prints can be obtained at the crime scene from clothing, cups, glasses, cigarettes, windows and doors. Investigators often gain evidence through the use of odontology, anthropometry, fingerprints, and other techniques that determine gender, approximate age, height, and blood grouping. Today, however, investigators can also rely on lip prints to identify possible suspects or to support evidence gained in specific investigations. As the available literature is scanty, hence this review was considered to throw some light on lip prints.
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. Use of lip prints in personal identification and criminalization was first recommended in France by Edmond Locard.

In 1950 Synder was the first person who suggested the idea of using lip print for identification who suggested the idea of using lip print for identification. He had conducted an investigation of traffic accident and proved that the characteristics of lips formed by lip grooves are as individually distinctive as the ridge characteristics of fingerprints.

Until 1950, however, anthropology merely mentioned the existence of the furrows without suggesting a practical use for the phenomenon. Since 1950 the Japanese have carried out extensive research in the matter. In the period 1968-1971 two Japanese scientists, Y. Tsuchihashi and T. Suzuki examined 1364 persons at the Department of Forensic Odontology at Tokyo University. Based upon that research it was established that the arrangement of lines on the red part of human lips is individual and unique for each human being. This statement led to the conclusion that there is the possibility of using the arrangement of furrows (on a trace, in a linear form) on lips for the identification of a person. In further research the Japanese scientists examined the principles of the heredity of furrows on the red part of lips.

In Poland, the interest in lip prints started in 1966 when a lip print was revealed on window glass at the scene of a burglary. Research was carried out, and its results were comparable to those achieved in Japan and Hungary. The research was only of preliminary character and did not allow for practical application of results as yet. A project aiming at that objective was launched in 1982, in the Forensic Institute of Warsaw University Criminal Law Department, in cooperation with the former Forensic Institute of Militia in Warsaw. The material for study was collected in the former Military Training Center at Minsk Mazowiecki. Lip prints were collected from 1500 persons (including 107 women), coming from various locations around the country. The age of the volunteers varied from 5 to 60 years. Altogether more than 7000 traces of the red part of the lips were examined. As a result of the examination the individuality of lines in the red part of lips and their unchangeability within the limits practicable for identification was proven.

Since 1985, in Poland, the methods of finding and recovery of lip traces, recovering comparative material, and the techniques employed to carry out that expertise have been introduced into casework of the Fingerprint Department, of the Central Forensic Laboratory of Police in Warsaw. During the years 1985-1997, cheiloscopy techniques have been used in 85 cases, including 65 burglary cases, 15 cases of homicide, and five cases of assault. In 34 cases the identification was positive, which means that cheiloscopy techniques were equal in value to other types of forensic evidence. It has also been included in evidence for presentation in court.

Cheiloscopy [Examination of lip prints]

Cheiloscopy is a forensic investigation technique that deals with identification of humans based on lip traces. Lip prints have to be obtained within 24 hours of time of death to prevent erroneous data that would result from post mortem alterations of lip. Lip print pattern depends on whether mouth is opened or closed. In closed mouth position lip exhibits well defined grooves, whereas in open position the grooves are relatively ill defined and difficult to interpret.

The foundations of cheiloscopy, however, are the same as that of dactyloscopy, that is to say, lip prints are invariable, permanent and allow establishing a classification.

Classification of lip prints

In 1967 Santos 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

Suzuki and Tsuchihashi (1970) have proposed a classification of lip prints also known as Tsuchihashis classification, these are most widely used classification in literature. They classified the natural lip marks/fissures in four types as follows.

Type I: Vertical grooves

Type I': Partial length across the lip grooves of type I

Type II:

Type II': Partial length across the lip grooves of type II

Type III:

Type III': Partial length across the lip grooves of type III

Type IV:

Type IV': Partial length across the lip grooves of type IV
Conclusion

Any process that possesses the possibility of assisting the forensic field in identifying a suspect should be pursued and, if discovered pertinent, utilized in the act of criminal investigations and legal proceedings. The use of lip prints falls into this category and because they have been proved reliable and trustworthy to link a suspect to a crime, more emphasis should be given to this field. Lip print analysis is a process that provides both qualitative and quantitative results thus its application in the forensic field should be widely accepted by both law enforcement and the legal professionals.

Unlike fingerprints, unanimity still does not exist between investigators to accept cheiloscopy as a method of human identification.

The positive identification of living or deceased persons using the unique traits and characteristics of the teeth and jaws is a corner a stone of forensic science. 18 A series of forensic odontological studies on the morphology of the lips and the pattern produced when they are impressed on to a variety of surfaces forms a worthy additional weapon for personal identification. 5, 10, 15 Some researchers are trying to relate characteristic lip patterns with persons gender, and detected DNA in latent lip prints. 19

The main feature for dental identification is the existence of ante-mortem data 20, 21 which cannot be expected in cheiloscopy therefore the only use of cheiloscopy will be to relate lip prints to the lips produced them. Research suggests the conclusive evidence that lip prints are suitable for the successful comparison, analysis and identification of a person to a crime. In fact there have been convictions of perpetrators who were positively identified via the analysis of their known lip prints to those found at the crime scene. There is a need to develop one cohesive cheiloscopy system, practicable in forensic odontology.

Apart from identifying and evidential use, lip prints may also be used in detection work, being the source of tactical and criminalistic information. A lip print at the scene of a crime can be a basis for conclusions as to the character of the event, the number of the people involved, sexes, cosmetics used, habits, occupational traits, and the pathological changes of lips themselves.

Research studies and information regarding the use of lip prints as evidence in personal identification and criminal investigation in forensic dentistry are very much scanty, but exist as a methodology in forensic dentistry. Studying in depth and establishing further facts and truth in lip prints will certainly help as useful evidence in forensic dentistry.

References


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