

Cheiloscopy - An approach for personal identification and sex determination

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Abstract

In any crime investigation recognising the person is a very essential role. The lip print of each individual is exclusive and may be utilised in identification of human beings and sex of the individual. Thus, lip prints are often used to substantiate the presence or absence of a person at the scene of crime. Cheiloscopy, the method that deals with identification of human beings based on lip prints, is a forthcoming tool for the identification of persons. It is a forensic investigation method that deals with identification of humans, formed on lips traces. The wrinkles and grooves on labial mucosa referred to as sulci labiorum form a characteristic figure referred to as 'lip prints'. This article provides an overview on Cheiloscopy in Forensic Odontology.

Keywords: Cheiloscopy, Lip prints, Forensic Odontology.

Introduction

The word cheiloscopy is procured from the Greek word Cheilos which means “lips” and scopy means to examine. R.Fischer, an anthropologist in 1902 described the furrows on the red part of human lips [1]. The first ever research on lip prints was carried out in Hungary, Europe in 1961. It began at a scene of crime where lip traces were discovered on a glass door.¹

Lip prints of each individual are distinctive except in monozygotic twins and do not vary during the whole life of a person. It has been discovered that the lip prints of parents and children and those of siblings have shown semblance. It has also been established that lip prints retrieve after going through alterations such as inflammation, trauma and diseases like Herpers, Cold sores, erythema multiforme etc. It is viable to identify lip patterns as early as 6th week of intrauterine life.

Recognition of a human being is expedient for personal, social and legal grounds. The involvement of finger prints in the past was the only well grounded means of identification of a person. In people, the patterns of finger print are distinguishing and constant and hence considered as an identification tool. However, the acknowledgement of the advanced techniques in identification of a crime has distressed the criminals leading them to use sufficient precautions like the use of gloves.² In such conditions,

the recognition of the criminal using techniques like finger printing, fail to incept a positive identity. Thus investigator can count on an alternate technique such as cheiloscopy as supportive evidence.

Lip prints that may be collected from the scene of crime could be of three types

1. Visible Lip Print: Traditionally, the use of lipstick was necessary to leave behind colored traces of lip prints. These are called visible lip prints.
2. Persistent Lip Print: Marks made by invisible lipsticks on different surfaces may be regained days after being formed, using agents such as aluminium powder and magnetic powder. These are termed as “persistent” lip prints.
3. Latent Lip Print: Marks made by the secretion of oil and moisture from minor salivary glands, sebaceous glands and sweat glands present at edges of the lips which may be developed are called “latent” lip prints.

Registering of lip prints

Identification is of foremost importance in any investigation related to a crime. Cheiloscopy is a profitable technique mostly in identifying the individuality of a human being based on lip traces, which can be found at the scene of crime and can be used in a court of law against the criminal.

Lip prints can be recorded in abundant ways

1. Direct photography if the prints are present on a glass surface.
2. Photographing the suspects lips³
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.³
4. Using numerous substances such as Aluminium powder, Silver metallic powder, Silver Nitrate powder, plumb carbonate powder, fat black aniline dyer or Cobalt Oxide.
5. All lip prints contain lipids which make their development possible by using Lysochromes dyes (Sudan 3, Oil Red O, and Sudan Black).⁴

The print recorded is either directly photographed or covered by a cellophane tape to maintain a permanent record. Currently, many types software's are used to record the lip prints.

Registering Lip Prints from suspect⁵

These consecutive methods can be used to record the lip prints

1. On non porous flat surface such as mirror, they can be photographed, enlarged and overlay tracings made of the grooves.
2. Rouge can be applied to the lips and then lips are photographed.
3. After using lipstick, the impression should be taken on a paper until the lipstick has exhausted.
4. Using special creams on the lips and then transferring it.

Benefits of Registering Lip Prints

In Sex Determination

In a study performed by Vahanwala – Parekh,^{6,7} it was illustrated that certain patterns were prevalent in either sex.

1. Type I and I' are prevalent in females in third and fourth quadrants i.e. lower lip.
2. Type II is characteristic in males in the second quadrant i.e. upper lip, left side.

3. Individuals with all quadrants having different pattern were common in males whereas having same pattern in all quadrants were seen in females.
4. Type I and I' are dominant in Fe

For Personal Identification

The specific grooves on the Human Lips play a crucial role in identification of a human being which many studies have justified.

Shortcomings of registering lip prints

The lip pattern is on the vermilion border of the lip, which is quite mobile and lip prints may differ in appearance according to the pressure, direction and technique used in registering the lip print. If lipstick is used for recording, the quantity of the lipstick used can also affect the print. Also the print is traced manually which presents problems with reproduction and introduces some subjectivity to the comparison.⁸ There are some pathological conditions which can invalidate the cheiloscropy study such as Lymphangioma, Congenital lip fistula, Lip Scleroderma, Syphilis, Lip Chelitis etc.⁴ It should also be recognized that only in very defined circumstances, there is antemortem data implying to lip prints, which obviously impairs a comparative study where necro-identification is concerned. The main feature for dental identification is the existence of antemortem data which cannot be expected in cheiloscropy. Therefore, the only use of Cheiloscropy will be to relate lip prints to the lips that produced them.^{3,8,9}

Scope of Cheiloscropy

When the prints don't seem to be lucid (only the appearance of the lips is printed), individual identification of a person based on this trace is very hard (unless the trace contains a lot of individual characteristics by scars) and sometimes identification ends with group identification. In these cases, it is feasible to inspect the substance which constitutes the trace e.g. Saliva as a biological trace. The potential for DNA typing from the lip print is perceptible. If lips are coated with remains of food or cosmetics and also the lines are printed unclearly, the trace can have the shape of a stain and can be subjected to chemical examination so as to determine the substance covering

the lips.¹⁰ Traces with clear lines and individual elements enable individual identification of a person. In this sense, lip prints have the same worth as Dactyloscopic (Finger print) traces.

Conclusion

Today, investigations can count on Lip Prints to identify possible suspects or to base the evidence gained in specific investigations. However, many investigations are still required to appreciate more about the science of Cheiloscropy. Collection of the visible as well as latent Lip Prints with apt transferring and recording media is important for its application as positive forensic evidence. There are even possibilities of using identifiable lip prints obtained from the skin of assault and murder victims in a similar way to what has already been done with latent finger prints. Thus one can conclude that identity can be well established by a combination of methods which makes the identification process comparatively unblemished.

Source of Funding

None.

Conflict of Interest

None.

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How to cite this article: Sansanwal M, Chowdhary S, Bhateja S, Arora G. Cheiloscropy - An approach for personal identification and sex determination. *Int J Aesthet Health Rejuvenation* 2019;2(4):77-9..