

REVIEW ON POROSCOPY

Chandigarh University

Anshika Kaushik, Navjot Kaur

Abstract

Poroscopy is the detailed study of microscopic structures known as pores, which are the openings of sweat ducts on the friction ridges of skin. Pore size, shape, frequency and relative position varies from person to person and hence are used for personal identification. It comes under third level of detail and is used when second level failed to give any result hence, is more accurate and reliable. Fingerprints are considered as gold physical evidence and also used in biometric system for personal identifications. This field require proper expertise, knowledge and experience of the expert to make an unbiased and correct opinion.

Introduction

Forensic science is the application of all natural sciences to the court of law. The tools and techniques used in forensic science are an aid in criminal investigations, collecting evidences, solving the mystery of case and in identification of culprit. Fingerprints are the impressions left by friction skin ridges of fingers. Fingerprints are unique, remain same throughout the life of a person, non-mutable, infallible and have a characteristic pattern. They are also used as biometric as no two fingers yet have been found to have same ridge characteristics, so they are unique for every individual and help in establishing the individuality of a person. Fingerprints are considered as best physical evidence because they are easily found at crime scene, easy to locate, develop and examined. The three level details of fingerprints are used for comparison and examination. In the first level only fingerprint pattern are considered, this level is not always suitable because two or more person can have the same pattern type. Ridge characteristics and their relative position with each other are studied in second level of detail. Minimum eight ridge characteristics are required for establishing the similarity between the two prints. If sufficient number of minutae are not present because of fragmentary or smudged prints than the expert goes for third level of details in which detailed microscopic study of pores and edges are done.

Pores are the opening of ducts of sweat glands on the surface of hand and feet through which human perspiration comes out and leave an impression whenever come in contact with any surface. The study of the number, shape, size, frequency and relative position of these pores is known as poroscopy. In 1686, Marcello Malpighi was the first one who examined pores, ridges and mouth of sweat glands and used microscope in medicine. Edmond Locard, for the very first time used the

concept of poroscopy, where second level detailed failed in solving the mystery of famous theft case of Boudet and Simmonin. He was the father of poroscopy. He stated that agreement in between 20-40 pores are sufficient for positive result and was also known as Sherlock Holmes of France.

Locard stated that pores vary in size, shape, frequency and their relative position. Size of pores varies from individual to individual (diameter 88-200 micron) i.e. small, medium and large. Pores can be round, rectangular, elliptical, oval etc. in shape. Frequency of pore is defined as number of pores per unit area or number of pores on given length of ridge. The relative position of pores with each other is one of the most important used for identification purposes. Sometimes two pores lie so close to each other that they appear to form a triangle, these are the striking marks which are very useful during comparison process. David Ashbaugh gave two method for comparison of pore location. First method is visual examination of pore location around a particular ridge characteristic and second method is overlay method where enlarged photographs are used to study pore location. He also mentioned some drawbacks and their improvement in the field of poroscopy. In 2000 Bindra et al. worked on inked and latent fingerprint impression (rolled and plain) studied various features of pores and concluded that large size pores are least and medium size pores are found the most. Similarly, they stated that rhomboid and round shape pores are more common and also that hypothenar region of palms have the maximum number of pores and the minimum number of pores are present in thenar region. They studied one more feature of pores i.e. interspacing which is the space between two pores. On the basis of clarity, they classify pores as clear, very clear and not clear. Chaudhary and Kumar studied poroscopy and edgeoscopy and revealed that whenever a person writes on paper he/she leaves latent palm impression which are examined using poroscopy for individualization. Pore distribution on nose is stable, a distinguishable feature between different persons and can be used for personal identification was given by Song et al. The study of different aspects of pores in south-Indian population was carried out by Preethi et al. and observed that there is no difference in pore shape, size and position on the basis of gender but a greater number of pores are more in females as compared to males. As the age advances there is change in size, shape, position and number of pores as concluded by Nagesh et al.

Use of poroscopy in forensic science

The study of pore size, shape, frequency and their relative position is a very significant tool in the field of forensic science. their study along with dactyloscopy and palm print identification helps in identifying the culprit in criminalistics. It is a comparative study and 20-40 number of pores are sufficient for making an opinion. it is used when sufficient number of ridge characteristics are not present. Poroscopy is an important phenotypical trait in human anatomy and anthropology as many of the medical diseases are associated with pores. It is used for personal identification of a person and can be used as biometric also in future.

Conclusion

Poroscopy is very useful in establishing individuality of a person especially when the second level of detail failed to give positive result. Sometimes the prints that are found at scene of crime are partially smudged or fragmentary or do not have enough number of characteristics than poroscopy is a very reliable tool for giving opinions. It is a very vast field but just require expertise, experience and proper knowledge of expert. The difference in number, size, shape and relative position of pores between different persons and also between different fingers of same person proved to be an important aid in individualization.

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