

Occupation marks and their Forensic Significance

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ABSTRACT:Occupation marks are produced on the skin of a person in response to the particular type of occupation. These marks are attained during their line of work which will be dependent upon the type of work people they do. These occupation marks assist the investigators in personal identification of the unknown victim. Many researches have been done to determine various occupational marks that occur in different professions. This paper focuses on occupational marks developed on people involved in various professions.

INTRODUCTION

Forensic science is a field of science which is applied in the court of law for legal matters to provide justice to the innocent and punish the guilty. Identification of the unknown body is one of the important tasks in forensics. Occupational marks help to great extent in identification of the anonymous body. Occupation marks are produced on person's body in response to the particular type of occupation and the location of the work. These marks are attained during their line of work which will be dependent upon the type of work people do. Occupation marks are significant in forensic investigation for identifying the deceased of mass disasters like earthquake, building collapse, aircraft crash, explosion etc. when the identification cannot be done due to facial damage and dismemberment of body parts. They can be developed on any part of the body depending upon the type of their occupation, like, in hands, foot, bones, teeth etc. [1]

Occupational marks produced in the skin are generally calluses and corn that occurs in areas exposed to frequent friction or pressure. [2] These marks on skin are normally seen in manual workers. Occupational marks can also be seen in professional workers who are indulged in office related works, athletes, musicians, etc.

Major population of our country is involved in the work where their work involves use of hands to some point. It is easy to distinguish between the rough hands of laborers and the smooth hands of those working in offices. Many people working in the industry regularly use certain tools, their continuous use results in developing specific marks on the hands or on areas where the tools come in contact, thus it helps in recognizing the type of work a person is involved in. DNA analysis helps in identification but sometimes DNA analysis is not feasible therefore occupation marks help in the identification process.

Occupation marks in various professions

Many researchers have studied on numerous occupational marks produced on the skin due to different occupations.

A review was carried out in 1953 to study the occupational marks acquired by the barbers. Tiny hairs from male are accumulated on the finger of barbers, these hairs then pierce into the

fingers and the conditions which arise is known as interdigital sinuses. Various researchers have studied about interdigital sinuses of Barber's hands. [3]

Various Studies have occupational marks and skin disorders that are developed in athletes. Blisters, callous, abrasions, lacerations, etc. are common conditions that are seen in athletes. Further conditions also occur in athletes depending on the sports they play.

Some of the occupational marks and skin disorders are; Football: Black heel, callosities, Acne mechanica, Athlete's nodule, tennis toe [4]; Basketball: Basketball pebble finger, Black heel, Callosities [5]; Baseball Blisters, Callosities [6]; Boxing: Knuckle pads, Athlete's nodule; Cycling: Saddle sores, bicyclist's nipple; Lacrosse: Black heel; Tennis: Tennis toe, callosities, black heel; Marathon runners: Jogger's nipple, callosities, runner's toe [6]; Skiing: Skier's toe, Skier's palm, abrasions[4]; Softball: Blisters, Callosities; Surfing: Athlete's nodules, Surfer's dermatitis[4]; Weight lifting: Callosities, black palm, Acne mechanica , Lichenified plaques [4], [5].

Other sports include gymnastic, hockey, golf, softball, lacrosse, karate, etc, they all have some conditions like runner's toe, blisters, callosities, karate cicatrices, golfer's nail, lacerations etc.[4]

A study was conducted in 1992 regarding 'skin disease among musicians', another study was carried out in 2000 about 'skin conditions in musicians' and another research in 2004 about 'Contact dermatitis and other skin conditions in instrumental musicians'. Various music artists like guitarist, violinist, flutist, pianist, cellist, etc, develop occupational marks, generally in fingers and also in other areas depending upon the body parts involved while holding and playing the music instrument.[2]. Pianist develop a condition called Vasospastic white finger disease, paronychia [7],[8] and callous, Garrod's pad etc. are acquired by violonist[7],[8]. Callosities are also developed on fingers of drummers and on lips of clarinet players.[8],[9],[10].

Sugar artist develop occupational marks as well. They work at bakery and confectionaries. They are required to handle hot items and sugar. A research was published in 1996 about skin problems related to sugar artists. They often develop blisters in palm due to the contact with hot material. They also handle hot sugar which leads them to get burn (usually second degree) on hands with erythema and blistering. They are always involved in working with hot items and high temperature, which makes them to develop blisters and burns.[11],[12]

A research paper published on 2002 has showed that electricians develop skin necrosis, burns [13] as well as lichenification due to friction and pressure [2]

An article regarding coconut tree climbers was published in 2006. It presented a case on coconut tree climber with 20 years of work experience, who had hyper pigmentation and thickening of skin over bilateral forearms [14]. This lesion was present from the time he had started working as coconut tree climber. This condition was developed due to the use of forearms for climbing.

Another occupational mark can be seen in slipper strap makers according to the study conducted in 2008. Several callous are developed on their hands. The location and pattern of the callous developed on their fingers are exclusive to slipper strap makers due to their particular style of holding the scissor. This study has also discussed about other occupational marks produced by scissors like hair dressers, tailors, beedi rollers and gardeners. [15] They

all develop callosities and in some cases deformities. Similarly cobblers develop scars and cuts on fingers and thighs due to cutting leathers.[2]

Occupational marks can also be seen on teeth of tailors as they have the tendency of grasping needle between teeth and biting thread which produce abrasions on the teeth. A research on this was conducted in 2014. In this study samples from 70 tailors were collected and observed the occupational marks on their teeth. The visual examination of the samples confirmed the presence of different types of abrasion among which irregular type abrasions were majorly observed. [16]

Workers of tobacco industry are often in threat of developing lesions in hands. Studies have been done on tobacco workers and have showed the occurrence of severe lesions in hands of cigarette makers. Studies have mentioned the development of eczematous lesions in hands of workers, usually produced by mechanical trauma or alkalinity of tobacco.[17],[18],[19],[20] callous are also seen on the fingers of the workers in tobacco industry. There are various sources for the development of lesions like, pesticides used for the growth of tobacco, pastes and glues used and the leaves of tobacco.[19],[20],[21]

A research was published in 2018. It was a study conducted on butchers to see the changes in their hands. This study was done on 24 butchers, majorly on men and 45.8% of them showed lesions on their hands. As the butchers come in contact with meat on a daily basis they are exposed to biological agents from raw meat. Contagious viruses like papillomavirus (HPV) cause a condition known as butcher's wart.[22] HPV produces lesions on the hands. Therefore hyperkeratosis are seen on butchers hand.[2]

Construction workers develop skin burns and necrosis due to constant contact with cement which has many irritants and allergens. They also develop blisters and callosities on hands and their skin are abraded. These conditions are more prevalent where workers do not use protective gear like gloves. [2],[23]

CONCLUSION

Various literatures are available which discuss about occupational marks of numerous professions. However occupational marks of many more professions are in need to be studied. Occupational marks are an important clue in forensic science, especially in establishing the identity of unidentified body. Occupational marks will help in narrowing down the search to establish the identity.

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