Dermatologic Complications with Body Art

Tattoos, Piercings and Permanent Make-Up

Christa De Cuyper
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Second Edition

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EXTRAS ONLINE

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Springer-Verlag Berlin Heidelberg
ISBN 978-3-319-77097-0 ISBN 978-3-319-77098-7 (eBook)
https://doi.org/10.1007/978-3-319-77098-7

Library of Congress Control Number: 2018942637

Printed on acid-free paper

This Springer imprint is published by the registered company Springer International Publishing AG part of Springer Nature
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Body modification is a common human characteristic that has been practiced on all continents and in all races since ancient times. Specific types of body art have been associated with specific social, ethnic and religious societies. Permanent modifications such as piercing and tattooing are common forms of body adornment. In the last decades they have been promoted as a fashion statement by celebrities and nowadays they are accepted in all social classes. Cosmetic tattoos or permanent Make-Up (PMU) have been introduced as an alternative for conventional Make-Up. Tattoos are also used in medical procedures, e.g. for field demarcation in radiation oncology and endoscopic surgery. Tattooing, also known as dermatography, has found its place to camouflage pathological skin conditions such as vitiligo and alopecia or to mask scars and birth marks and it can offer the finishing touch in reconstructive surgery. Its use can also be extended to therapeutic indications and for the implantation of pharmacological substances. Tattooing is only one aspect of body art. The imagination in body adornment and body transforming techniques is amazing and endless. Piercing is often combined with stretching, tunnelling and embedding of jewels. Invasive body-modifying techniques such as implanting, scarification, branding, scalping and even amputation seem to attract the young population; unfortunately these procedures often result in impressive, irreversible body mutilation. All body-modifying methods can lead to complications, which depend on the hygienic conditions in which the procedures are performed, on the training and the skills of the practitioner and on the materials. Allergic reactions can be attributed to the substances used. Poor hygienic standards and careless procedures can result in localised infections but can also lead to severe life-threatening conditions or even result in irreversible damage. Blood-borne diseases can be transmitted (hepatitis B, C, HIV); granuloma and keloid formation can occur. Health care professionals should be aware of the complications that can arise from these procedures.

The body art industry is one of the fastest growing industries in the last years unaffected by the economic crisis. Considering the high number of people that have chosen for a tattoo, a piercing or any other form of body modification, one can estimate that millions of people on the globe live with a self-inflicted health risk with consequences for the health care system in general. Many efforts have been made yet to identify risk factors and to develop preventive measures aimed at protecting public health. Regulation of the composition of the products, harmonisation of the methods for the

analytical determination of possible harmful substances, guidelines and recommendations to ensure that procedures are carried out under appropriate hygienic conditions can offer a big step forward to promoting consumers health. However there is still a lack of uniform universal regulations and control. Recently, new initiatives have been taken by the Council of Europe and by the European Commission to improve the safety of the procedures and the materials, more in particular to limit the risk of side effects caused by poor hygiene and unsafe substances.

The purpose of this book is to illustrate the different aspects of body art starting from the history through epidemiology, to improve the knowledge about materials, with their toxic and allergenic potential, to describe the procedures and the complications that can arise. Cosmetic and medical indications and therapeutic modalities of tattooing will be addressed. A separate chapter is dedicated to tattoo removal with a focus on laser techniques.

To realise this book we had the assistance and contributions of many people whom we would like to thank, in particular the members of the European Society on Tattoo and Pigment Research (ESTP) for their advice, our colleagues, our secretaries and our families for their help and support.

Blankenberge, Belgium — Christa De Cuyper
Santiago, Chile — Maria Luisa Pérez-Cotapos S

Acknowledgements

Yves Bogaerts
Videos and figures
Blankenberge, Belgium
Sandy Verfaille
Inksane, Roeselare, Belgium
Kim Maertens
Inksane, Roeselare, Belgium
Elayne Angel
The Piercing Bible, Merida, Mexico
Darline Vierstraete
The Color Studio, Waregem, Belgium
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List of Videos

1 History and Epidemiology of Tattoos and Piercings: Legislation in the United States and in Europe

Anne E. Laumann and Nicolas Kluger

Core Messages

- Tattooing and body piercing date back to early civilizations.
- In the past, they were used during initiation rites or as an indication of social status.
- Tattooing has been used to identify criminals, prisoners, and slaves and for punishment.
- Body modification has become more common and more sophisticated over the last 50 years.
- Body art may be associated with risky behavior.
- Body piercing may be associated with depression.
- Legislation is variable from country to country and state to state.

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1.1 History

1.1.1 Tattoos

Tattooing, defined as the practice of producing an indelible mark or figure on the human body by inserting pigment under the skin using needles or other sharp instruments, has probably been around since the beginning of humanity [1]. There is not so much a continuous history related to tattooing, but rather many concurrent happenings in different societies across the world. Tattoos disappear when their canvas goes; in other words, with the death of the individual, so our current information may be more discontinuous than the reality.

The famous 5300-year-old preserved corpse, nicknamed Otzi, found in the mountains of the South Tyrol in 1991 was covered in tattoos. These included linear marks over many of his joints and a cross on the inside of the left knee. They may have been placed to help with pain from his evident arthritis [2, 3].

Dark blackish-blue inscriptions have been found on Egyptian mummies dating as far back as 2100 B.C. Interestingly, it appears that this practice of tattooing was limited to women. It may have been only for decoration, but other hypotheses suggest a ritualistic significance or a relationship to fertility and sexuality. The tattoos were groups of dots and dashes in geometric patterns, often across the abdomen. The oldest of

C. De Cuyper, M. L. Pérez-Cotapos S (eds.), *Dermatologic Complications with Body Art*,
https://doi.org/10.1007/978-3-319-77098-7_1

these mummies is that of Amunet, a priestess of Hathor, the Egyptian goddess of love. Later (circa 1532–1070 B.C.), female mummies from the New Kingdom of Nubia (South Egypt) were embellished with representational tattoos, for example, the image of the god Bes, on the thighs.

In the late eighth century B.C., Isaiah prophesied "This one will say, 'I am the Lord,' another will call himself by the name of Jacob, and another will write on his hand, 'The Lord,' and surname himself by the name of Israel" [4]. Old testament sayings like this together with the injunction "You shall not make any cuttings in your flesh for the dead nor print any marks upon you: I am the Lord" [5] in Leviticus, composed circa 550–400 B.C., belie the presence of these marks on the bodies of Israelites at that time. This latter admonition may have been motivated by the use of tattoos among non-Jewish people, for example, those of the cult of Baal [6].

About the same period, the Pazyryk were a nomadic tribe living in the Altai Mountains of Siberia. A number of their tombs have been opened and previously undisturbed bodies found to be elaborately decorated with real and mythical beasts. These pictures are thought to reflect the societal status of the bearer [6].

Likewise, it is clear that tattooing occurred in China. Although, in some parts, men tattooed their hands as a sign of valor and women tattooed the nape of the neck as a sign of marital status, in general, tattooing happened among "barbarian" peoples. Tattoos may have been used as facial cosmetics, to ward off evil spirits, or as marks of slavery or punishment [7] (Fig. 1.1).

In Japan, there is evidence from clay figures from the Jomon period (10,000–300 B.C..) of facial tattoos, and later, during the Yahoi period (300 B.C.–300 A.D.), tattooing occurred on the face for decorative and religious purposes and to ward off evil spirits. Later, tattooing fell into disrepute, and during the Kofun period (300–600 A.D.), it was used as a punishment and to identify "untouchables." Decorative tattooing, heavily influenced by the imagery of wood-block print artists, developed during the Edo period (1600–1800 A.D.). The Yakuza, who initially were flamboyant and crazy samurai in the service of the emperor, degenerated into the criminal class, and it was this group who became known for elaborate full body tattoos (Fig. 1.2). These tattoos, even today, may be applied by hand and take many days to complete. Their painful acquisition is a measure of courage and group solidarity. During the Meji era (1868 to present), tattooing has been forbidden, increasing the association with criminality, although, as in the rest of the developed world, tattooing is becoming more mainstream [8].

Fig. 1.1 The earliest written record of facial tattooing among the Drung culture of China is at least 350 years old. The tattoos are connected to rites of passage, and they also serve as tribal identifiers to differentiate the Drung from other neighboring groups

Little is known about tattooing during the latter part of the first millennium and the early part of the second millennium A.D., but the Inuit (Eskimos), who lived along the Arctic coasts of Siberia, Alaska, Greenland, and Canada, continued to use facial tattoos over the centuries (Fig. 1.3). They served to protect them from

Fig. 1.2 Nakamura Fukusuke in the role of Koito with Ichimura Ichizo in role of Sashichi. Color woodcut diptych with gauffrage 1858, seventh month. From the play *Fuka unbaka ikiji shinwara*. Signed: Toyokuni ga in a Toshidama cartouche. Artist: Utagawa Kunisada (1786–1865). Publisher: Otaya Takishi

enemies and showed the women could bear pain and were ready for marriage. Traditionally, older women did the tattooing using an unusual method of bone needles blackened with soot, which were threaded through the skin so that the black particles remained embedded in the tracks [8]. Symbols were formed mainly using lines, dots, and geometric designs.

Western interest in tattooing reappeared during the second half of the eighteenth century. Captain Cook, a British explorer, and his crew were fascinated by the tattooing they saw on the South Sea Island of Tahiti, the Mokos they encountered among the aborigines of New Zealand (Fig. 1.4), and the skin pictures on the inhabitants of Hawaii. The word "tattoo" came from the Tahitian word "tatau," meaning "the results of tapping," and it signified the noise made by the mallet when it hit needles made from sharp-toothed bones driven into the flesh. Tattoos among the Marquesan people were used to distinguish rank and age among men (Fig. 1.5). Tattooing started in the teen years and for men continued throughout their lives to cover the whole body, while women's tattoos were typically only on the face, lips, ears, feet, and hands. Tattooed individuals, including the famous Omai who was displayed as a human oddity, were brought back on ships to Europe, causing considerable sensation. In turn, the seamen learned the Polynesian tattooing techniques and produced their own designs. A French man, Jean Baptiste Capri, was tattooed on the Marquesas after he had deserted a whaling expedition, and in 1804 he displayed himself in Russia as the first European tattooed attraction, thereby paving the way for many other sideshow human oddities. Traditional tattooing died related to the arrival of protestant missionaries, despite the stories of the English missionary, John Williams, using the

Fig. 1.3 Yupik figure with chin tattoos

Fig. 1.4 Facial Moko. Photographer: Walter Brooks (with permission)

local skill to have the word "murderer" tattooed across the upper lip of a woman who had murdered her husband.

By 1846, there was sufficient demand among soldiers and sailors and from others who wanted to make livings as "tattooed masterpieces," for Martin Hildebrandt to open a tattoo shop in New York City. This was followed in 1891 by the development of an electric tattoo machine by "Professor" Samuel O'Reilly and in 1904 by an updated machine with electromagnetic coils set transversely to the tube assembly. Both were based on Thomas Edison's recently patented electric pens. The design was updated again in 1929 by Percy Waters, a Detroit tattooist, and, with minor modifications, this is the machine that is in general use today. Although still painful, the rapidity of the multiple needle pricks needed to make an elegant tattoo has made the process more bearable and allowed for the popular spread of the technique. Between the two World Wars, tattoos became so mainstream among working class and military men that Norman Rockwell's illustration of The Tattooist was on the cover of the middle class magazine, the *Saturday Evening Post* [9]. Soon after this, a tattoo on the back of the left hand was used in highly successful advertisements disseminated across the United States to sell cigarettes.

Even in the modern era, tattooing has not only been used for decorative and voluntary group affiliation purposes but also for identification purposes, for example, for the cataloging of sick Russian and Jewish prisoners in the Auschwitz concentration camp during the Second World War (Fig. 1.6). This was done by using a stamp of numbers made out of needles and rubbing ink into the

Fig. 1.5 Proud parents: Island of Nuku Hiva, Tahiti Shores

wounds. Immediately after this during the Korean conflict, it was used to place a permanent marking on the body of an individual's blood type, using a purpose-built electric tattoo machine [10]. In the early 1980s, before it was known what caused this new life-threatening disease, there were discussions about tattooing the genital areas of those with acquired immune deficiency syndrome. This never happened, as far as the author knows.

The association with criminals and other marginal groups in the West results not from the forceful placement of tattoos but relates to the use of these for signaling affiliation with such groups. Tattoos may be done in prison, not by the guards, but by the inmates devising make-shift tattoo implements and using ash or other ink for pigment. These tattoos may have meaning, such as a teardrop close to the eye signaling having committed a murder (Fig. 1.7), or they may symbolize membership in a particular gang, for instance, a Pachuco cross or a five-point star. This latter type of tattoo is often performed as an initiation rite on the street or in a public place at the time the wearer joins the gang. In the 1950s–1980s, many tattoos were associated with motorcycle groups, as well as punks and hippies [11, 12].

More recently, with the advent of fine arts skill among tattooists, the use of many different types of pigment, and the publicity of celebrities, the practice of decorative tattooing has proliferated among those under 30 years of age across first world countries.

1.1.2 Body Piercing

Body piercing is defined as the cosmetic piercing of body parts for the implantation of objects such as rings, studs, or pins. Like tattooing, body piercing has been practiced in almost every society but has usually been confined to the ears, mouth, and nose, possibly for religious purposes [13]. Less has been written about this practice than about tattooing, although antique statues and remnants, for