

Laser removal of tattoo- a case report

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Abstract

Tattoo is one of the most frequently used techniques of permanent body decoration, it is a graphic sign obtained on the skin as a result of the introduction of dye into the skin tissue.

It happens that the tattoo begins to disturb, life circumstances change, the tattoo reminds you of something you would like to forget. The development of tattoo removal methods is the expression of a search for a method to completely remove it without damaging the tissue. The methods used so far include: lasers, surgery, peels, dermabrasion (chemical and mechanical), cryosurgery, electrosurgery, light coagulation in the infrared range, salabrasia (use of sodium chloride), camouflage, etc., however, no method guarantees complete removal of the tattoo.

Laser removal of tattoo

Tattoo is one of the most frequently used techniques of permanent body decoration, it is a graphic sign obtained on the skin as a result of the introduction of dye into the skin tissue. It is usually performed on: forearms, arms, legs and around the spine. Permanent tattoo

(permanent) is performed for a lifetime, however, with the passage of time the dye is absorbed into the skin and the tattoo changes slightly.

Modifications of the body may have a cultural or religious background, or they may be an expression of belonging to a particular subculture. Currently decorating the body with the help of a tattoo is probably in most cases following the fashionable and imitating the style of decorating by pop-culture stars, well-known actors, athletes and media people. Psychologists and researchers also indicate that modifying the body may result from specific developmental needs (eg creating one's individuality), it can be a form of self-expression, expressing one's thoughts, preferences, to emphasize one's femininity or masculinity, to be a way to emphasize one's identity and independence. Sometimes tattoos are simply made "fortunately" or are used to remember an important life event^{1, 2, 3, 4, 5}.

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Laser removal of tattoos uses methods of non-selective tissue removal or selective photothermolysis using high-energy Q-switched lasers. The most commonly used for this purpose: CO₂ laser, as well as ruby (694nm), which removes black, blue and green, Nd: YAG (1064nm) - black, blue and red, alexandrite (755nm) - black, blue and green and dye pulse (510nm) - bright, red, orange and yellow colors^{6, 7}.

In laser therapy (as in the case of other treatments in the field of aesthetic dermatology) the main contraindications are: pregnancy, lactation, pre-cancer and skin cancers, as well as active bacterial, viral and fungal infections. In addition, laser treatments can not be performed in patients with vitiligo, lichen planus or psoriasis vulgaris (due to the risk of new lesions appearing). Among other very important contraindications one should also mention: the tendency to keloids and taking medicines light sensitizers, which include, among others. psoralens, barbiturates, sulfonamides, some non-steroidal anti-inflammatory drugs, tetracycline antibiotics, antidepressants, sedatives, retinoids, ciprofloxacin and norfloxacin. In contrast, oral contraceptives may predispose to the development of discolourations of the molasses type. The photosensitizing effect is also exhibited by some herbs, e.g. Saint John's wort. An additional contraindication is a tan (laser treatments can be performed after a period of about 8 weeks from exposure to radiation)^{8, 9}.

¹ Armstrong M.L., McConnel C., „Tattooing in adolescents, more common than you think: The phenomenon and risks”, Journal of School Nursing, 10, 2004

² Martin A., „On teenagers and tattoos”, Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1997.

³ Carroll S.T., Riffenburg R.H., Roberts T.A., Myhre E.B., „Tattoos and body piercing as indicators of adolescent risk-taking behaviors”, Pediatrics, 109, 2002.

⁴ Roberti J.W., Storach E.A., Bravata E.A., „Sensation seeking, exposure to psychological stressors, and body modifications in a college population”, Personality and Individual Differences, 37, 2004.

⁵ Roberts T.A., Ryan S.A., „Tattooing and high-risk behavior in adolescents”, Pediatrics, 110, 2002.

⁶ Jones C., Nouri K.: Leczenie laserowe zmian barwnikowych: praca przeglądowa, Dermatol i Kosmetol 2006, 2(2):56-60

⁷ Magdziarz-Orlitz J.: Usuwanie tatuażu z zastosowaniem lasera Nd:YAG/KTP (1064/532 nm) - doświadczenia własne, Dermatol Estet 2008, 10(5):21-26.

⁸ Lanigan S. W.: Lasery w dermatologii, Czelej, Lublin, 2005

⁹ Pytrus-Sędkak B., Drozdowski P., Zub K.: Zastosowanie metody IPL w dermatologii estetycznej, Dermatol Estet, 2009, 11(5):385-392.

The suitability of the laser for individual tasks is determined by its parameters such as:

- wavelength (λ) [nm],
- pulse power (P) [W],
- single-pulse energy (E) [J],
- duration of a single pulse (for pulsed lasers) (t) [s],
- surface energy density [J / cm²],
- laser beam area [cm²].

About how many treatments should be performed and how the place will look after the removed tattoo decide:

- type of dye
- the depth of the tattoo
- way of tattooing
- the place where the tattoo was made
- reaction to a laser (immune system)
- individual patient predisposition

Side effects of laser therapy in permanent tattoo removal:

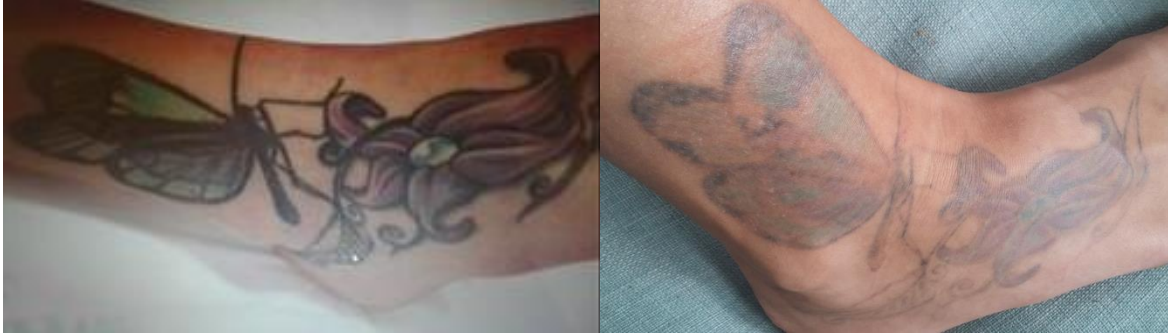
- discoloration, discoloration
- infections
- scars
- allergic reactions
- changes in the texture of the skin at the surgery site
- pigment not completely removed

Care after laser removal of the tattoo:

- It is recommended to cool the areas after LASER operation, eg applying cold compresses
- After 2 hours after the treatment, you can take a shower, but avoid long baths, bathing in swimming pools, lakes, etc.
- For the first 3 days after the treatment, the treated area should be washed about 3 times a day with water with the addition of a delicate gel or gray soap
- After washing, the skin should be dried with a disposable paper towel to avoid bacterial contamination. Drying should be carried out with gentle touches, do not rub the treatment area
- It is recommended to lubricate with an antibacterial ointment, eg Tribiotic, Triderm, Balm Tattoo Laser
- You can cover the areas after surgery to prevent infections. The dressing must be light and allow air to pass through
- Itchy skin is a natural sensation during the healing process after the laser removal of the tattoo. Under no circumstances should you scratch or scuffle, as it may cause scarring.
- Avoid shaving the area after the treatment until it has completely healed (approximately 10 days)
- Do not tan the area after the treatment for 12 weeks, use SPF 50 cream
- You can play sports, but it is not recommended to perform strenuous exercises for the first few days after the procedure¹⁰.

¹⁰ Szymańczyk J., Michalska I., Gołębiowska A.: Zastosowanie laserów wysokoenergetycznych w dermatologii, Medycyna 2000, 59/60(VII):25-29.

A case report:



Ryc.1. Before the removal of the tattoo (March 2018) and after eight sessions of laser removal of the tattoo (June 2019). Own study.



Ryc.2. Burns and blisters with fluid after one of the sessions. Own study.



Ryc.3. Scabies and healing of the surface after the session. Own study.

The patient did the tattoo in 2009, in 2014 she improved the tattoo. In 2018 she decided to start removing the tattoo, until now she is after 8 treatments using the Q-Switch laser. At the beginning it was ensured that the tattoo would disappear completely after a maximum of 6 sessions, but it is still visible. After each tattoo removal session, she had problems such as increased body temperature, lower limb warming, burns, blisters and exudation, great discomfort and swelling that persisted for over a week after each session. Removing the tattoo was very painful, the patient changed the room after four sessions. Subsequent sessions in another office (using a different apparatus) were less painful, edema and warming were also lower. With each session, the tattoo should blend by about 50%, however this does not happen. Probably this is affected by a fairly large area and the use of many pigments (during the correction of the tattoo in 2014 there was a pigmentation and the imposition of subsequent colors). Also, the area where the treatment was performed is a sensitive area with thin fat tissue.

After the procedure, the patient kept the limb in the elevation, cooled it with special gel compresses and had a kinesiology tape (application fan) to reduce swelling. Lymphatic drainage was also performed, which definitely depended the foot. As for the further removal

of the tattoo, you will probably need another few sessions (each of them costs several hundred zlotys), you can also try to cover with a tattoo in the color of the skin (however the color changes on the course of even the seasons and during the life) . A novelty on the market is the use of Tattoo Remover, however, it also does not guarantee complete removal of the tattoo. The disadvantage of this method is also the fact that one can only remove as much as 5 cm² tattoo at one time and perform treatments every 12 weeks. So removing such a tattoo will take a few years, because each treatment should be repeated 2-3 times.

The patient does not lose hope that over time other tattoo removal methods will develop, and the present ones will be improved. For now, he uses a special make-up to get the more formal out of the way to hide the half-removed tattoo.

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