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Original Research

Uses of Laser in Cosmetics: Laser Properties, Emerges as a High-Energy Laser Beam and Treatment of Skin Diseases

Duaa Fadhil Rashid [1], Fatima Mohsen Falih[2], Jihan Dhaif Hussein[3], Maria Harith Mohi El-Din[4], Maryam Salah Jassim[5]

1,2,3,4Baghdad University, College of Science, Department of Physics Sciences, Iraq.
5Albasrah university, College of Science, Department of Physics Sciences, Iraq

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Abstract:

The development of the use of technological automation in modern medicine is an amazing development, and advanced robotic technology has entered the world of medicine in a way that raises astonishment and admiration. Among its most famous applications is the entry of laser rays into the field of surgery, cosmetics, and eye diseases, and the treatment of skin diseases and other diseases, which added more magic and ingenuity to the treatment methods thanks to these wondrous rays, and brought about an unprecedented scientific revolution in the field of therapeutic and therapeutic medicine. Comfort has benefited greatly from these rays that are essential to our modern life. The laser has become widespread in the world of cosmetics and dermatology to treat various conditions and improve the shape of the skin. This powerful light beam with a specific wavelength is used from light sources that emit a very strong light that is focused on the skin for treatment, where it can reach To specific tissues in the skin and affecting them without causing any harm to the neighboring tissues, laser rays are non-ionizing rays, and these simply do not cause any abnormal growth of cells and therefore do not cause skin cancer. The side effects of the laser vary according to the type of laser used and according to the person himself (brown or white). It eliminates cancer cells and destroys them. In addition, laser rays can be used in medical fields and research, the most important of which are cancer treatment, dermatology, ophthalmology, and dental treatment. It has been shown that some cells of the body, such as brain cells and muscles, allow a laser beam to pass through at a certain frequency without absorption, and thus the laser beam penetrates He visits this Tissues and cells, it is concentrated in small spots and the laser beam is directed through the glass fibers and directed to kill cancer cells.

Introduction:

It has now been more than twenty-five years since the innovation of the laser was invented using a ruby crystal as a laser medium. Since that time, the laser has not been limited to merely being used in our daily conversation, but rather has begun to develop from a state of scientific curiosity of

limited use until it has become one of the most important innovations of our time. The laser is now an important tool in various fields such as industry and medicine. It represents the basic tool in communications and holographic systems. It is also the solid basis for many scientific measurements and research programs. Laser is used as a general term for different types of lasers with different characteristics. However, all lasers emit radiation with special characteristics, which helps in their use in a wide range of applications other than ordinary light sources. In light of the wide applications of lasers, it is clear that users who are not physicists need to acquire new information about lasers so that they can understand the specific applications that interest them, as well as understand the advantages and limitations of laser use. This knowledge will of course enable them to make a rational choice of laser and compound Any other assistance they desire I want it. The list of users includes mechanical engineers, electronics specialists, civil engineers, communications engineers, chemists, life scientists, surgeons, military personnel and others.

The laser has entered many areas of life due to its properties that enable it to perform many extraordinary tasks. The laser is a double-edged weapon used in peace as well as in war. Laser rays are electromagnetic light rays of known energy and selective ability Directed to specific goals. The uses of lasers cover various aspects of life, so the laser today is one of the most important and most widely used tools in modern life. There is no doubt that the great development in laser surgery has brought about a qualitative leap in the treatment of many medical problems, such as eye surgery and the treatment of various skin disorders. Laser belts have replaced the surgical scalpel in some operations because of their high accuracy in cutting tissue and reducing bleeding after surgery. This research aims to study laser in terms of the principles of laser, its foundations, the stages of its development, and the most important applications and uses of laser in the medical field and in cosmetics in particular, due to the great role that laser has recently played, as it has many risks of surgical operations, their cost, and the recovery periods that were The patient needs it after undergoing this type of surgical operation. In this research, I devoted myself to studying how to beautify the skin with a laser.
In this research, we will discuss the introduction, the purpose of the research, and the content of the research in the first chapter. The basics of laser, its definition, types, characteristics, method of operation, composition, applications, safety from laser risks in the second chapter. Cosmetic laser in the third chapter.

Laser basics:

Laser (in English: LASER, which is an abbreviation for Light Amplification by Stimulated Emission of Radiation) is electromagnetic radiation whose photons are equal in frequency and identical in phase and wavelength, as they constructively interfere between their waves to turn into a high-energy light pulse Very cohesive In time and space, it has very small nozzle angles, which cannot be achieved using techniques other than radiation stimulation due to its high energy and very small nozzle angles. Laser rays are used in several areas, the most important of which is measurement, such as measuring very small or very large distances with extreme accuracy It is also used in producing heat for processes Industrial parts and surgical operations, especially in the eye, and it is also used in electronic devices to operate optical discs.

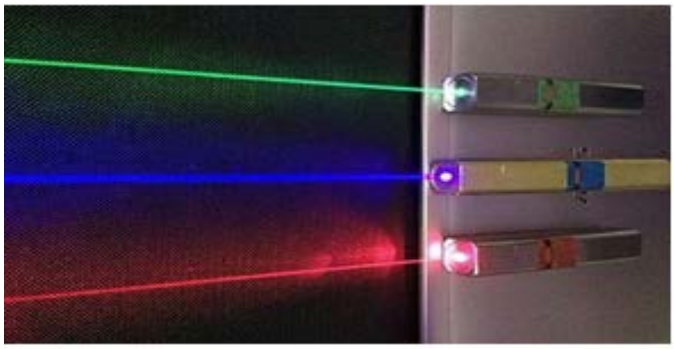

Figure 1. Laser light with different wavelengths

History of laser:

In 1916 AD, the scientist Albertenstein was able to lay the theoretical foundations on which the laser works, in his research on the photoelectric phenomenon. In this phenomenon, scientists noticed that when light electromagnetic radiation is

directed onto a metal surface, electrons are emitted from this surface only if the frequency exceeds a certain limit. However, if the frequency of the light is less than that, then electrons are never emitted, no matter how intense the illuminated light is. This phenomenon remained a mystery that baffled scientists until Einstein was able in 1905 to solve this puzzle after proving that light has a wave nature. It has been proven that light and other types of electromagnetic radiation are not a continuous stream of energy, but rather are in the form of small units of energy called photons. The amount of energy carried by one photon is directly proportional to the frequency of light, and the constant of proportionality is Planck's constant.

In 1947, the physicist Lees Lamb was able to practically prove the existence of the phenomenon of stimulated emission. In 1954, Charles Towne was able to obtain stimulated radiation in the range of fine waves and gave the name “maser”, which is an abbreviation of the English phrase (maser). With this achievement, scientists’ hopes were renewed to obtain stimulated radiation in the visible or invisible light range, and then the laser was manufactured. In 1955, the Russian scientists Prokhorov and Basov proposed the use of optical pumping to obtain what is called the inverted distribution of electrons, which is one of the conditions for laser operation. In 1960, Theodoremann was able to manufacture the first laser in the visible light range. In 1961, the scientist Ernie Javan and the American William Bent were able to manufacture the first gas laser using helium-neon, which gives continuous rather than pulsed radiation. In 1962, Robert Hall was able to manufacture the first semiconductor laser, which is characterized by its small size, and in 1964 it was manufactured On carbon dioxide laser Which is characterized by high radiation capacity The laser uses single-wavelength light rays, that is, they have the same wavelength, and they are generated in certain types of pure crystals. The laser device works to level the phase of the light waves so that they are all in the same phase, thus increasing their energy. The adjacent figure shows light waves that are in the same phase, so what is called constructive interference of light waves occurs. While an ordinary lamp radiates light in irregularly scattered light waves, it does not have the energy of a laser. However, by using crystals of suitable materials (such as ruby red) of high purity, it is possible to stimulate their production of light rays of one color (i.e., of one wavelength) and also of one wave phase. Then the waves match each other by reflecting several times between two mirrors inside the laser crystal, so the waves are organized, interfere constructively, and emerge from the device with the desired high energy.

Connectivity:

Laser Properties:

The laser has several properties that distinguish it from other rays. Monochrome or wave spectrum when it has one "one wavelength" frequency and the light source has a high degree of monochrome pigment when the spectrum achieves a very narrow range of frequencies around Given frequency. This means that the laser light package has a very narrow range of frequencies determined by the breadth of the spectral line. It has its own effect on the vastness of the resulting radiation, and this is much smaller than the wide change that the automatic emission of the atom gives in its normal sources of light. When monochrome light should be obtained from it using filters or uniforms when the light emitted from it is narrowed by frequency or wavelength.

Connecting the waves of the single beam, spatially and temporally, the light waves or photons help in strengthening each other to give energy and high power to one beam. We find that the waves of ordinary light are not intertwined with the spectral lines of the breadth of their spectral lines, and we can practically provide their origins to some degree, but at the expense of the intensity of the light, as in the experiments of interference in light.

Directivity

That is, the dispersion or change is almost non-existent, and it is, by its nature, focused without the need to use lenses, and its diameter may reach less than the diameter of a pin, and it can be transmitted to long distances with little loss in the energy transmitted by the concentrated radiation

in its narrow beam, and this gives the characteristic of high intensity to the laser rays

How to produce a laser:

Lasers can be produced in several ways, including 1-4-2 absorption We assume that the electron in the atom is located in the ground level of the atom. It will remain in this level unless an external stimulus affects it. Let us assume that an electromagnetic wave whose frequency is determined by the equation:

In this case, there is a certain possibility for the electron to move to level (2). The energy difference (−) required for this transition is obtained by the atom from the incident electromagnetic wave, and this represents the absorption process.

Stimulated emission:

We assume that the atom is in energy level (2) and an electromagnetic wave of frequency falls on the material. The incident wave S will encourage the atom to move from the second level to the first level. In this case, the energy difference (−) is transformed into an electromagnetic wave that is added to the incident wave and this It is the phenomenon of stimulated emission. However, there is a fundamental difference between the two processes of spontaneous emission (stimulated emission). In the case of spontaneous emission, there is no specific relationship between the phase of the wave emitted by one atom with the wave emitted by another atom. Also, the wave emitted by the atom can be in any direction, but in the case of stimulated emission, since the process is forced by the incident wave, the emission from any atom has the same phase and direction as the incident wave. In this case, we can describe the process of stimulated emission with the following equation: Since is the rate of transitions from level (2) to level (1) that occur as a result of stimulated emission, and it is called the probability of the stimulated transition, the parameter also has the unit (time), as it depends

on the intensity of the incident electromagnetic wave.

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Inverse distribution:

What we mean by it is that the number of atoms in the highest state of excitement is greater than the number of atoms in the stable state, and the name inverse is given because the number of states with lower energy levels in the case of thermoelectric machines is usually greater than the number of states with higher energy levels. The higher the energy level, the smaller the number of states, according to the Maxwell-Boltzmann distribution function. This function depends on the absolute temperature of the medium.

In normal conditions, the probability of atoms moving from one level to another through absorption or emission of a photon whose energy is equal to the difference between the two levels. Therefore, the direction of the transfer depends on the number of atoms in each level and is towards the level with the lower number. However, in the case of thermal equilibrium, the ratio of the number of The atoms in the two levels are as follows:

N2/N1=exp{-(E2-E1)/KT}

K is Boltzmann's constant

In the case of an inverse distribution, it means that the temperature has a negative value.

How the laser works:

When light falls on the active medium, the medium is stimulated to produce color from the light, which is one of the characteristics of the medium or the chosen crystal. After the light is reflected several times inside the medium, the light waves collected in the lens reach the place where they are phased and emerge as a high-energy laser beam.

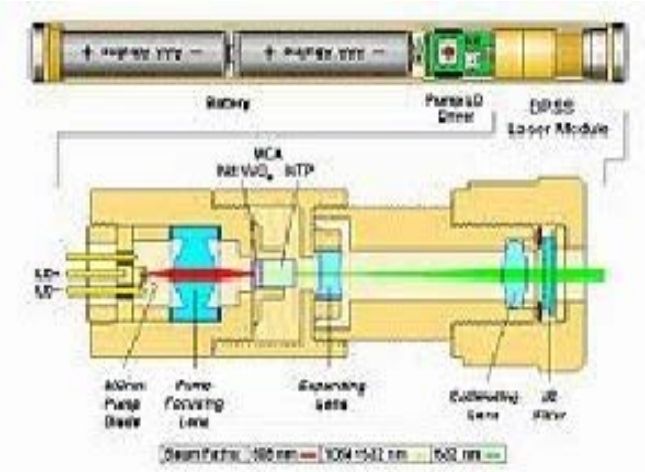

Figure 2. Internal laser installation

- Moderate gains
- Energy pumping
- Reflector height
- Outputs are coupled
- Laser beam

2-6 Main laser components

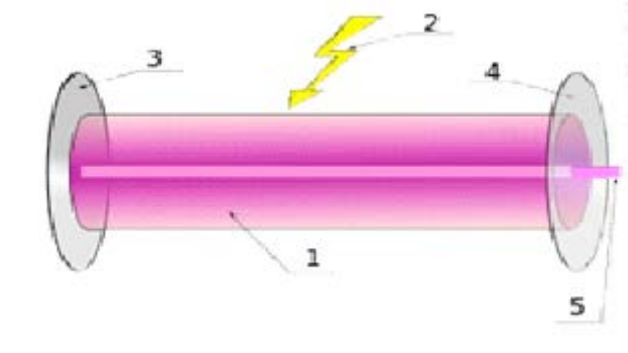

Figure (2-6): Parts of the laser device

(1) The medium or crystal that produces laser rays.

(2) Electrical energy to stimulate the active medium to emit light waves

(3) High-performance light reflector (mirror).

(4) Light reflector (mirror)0

(5) Output laser beam (laser output)

The laser device works by reflecting light of one color, that is, of one wavelength, between the rear mirror (3) and the lens. This is done by stimulating the medium to produce that color of light, which is a characteristic of the chosen crystal or medium. After the light beam is reflected within the medium several times, the collected light waves reach equilibrium. Then it has a regular phase (step) and

Emerges as a high-energy laser beam. The types of lasers described below give distinct laser lines and wavelengths. We mention the types of lasers that emit light in the long wavelength range, the technology used, the color and the type of laser 7-1 Gas laser Certain gases are used to produce the laser beam, including: (He-Ne) Helium-neon laser that emits at various wavelengths in the 633 nm range, and is very popular in ophthalmology education because of its low cost.

Carbon dioxide laser:

It can emit several hundred kilowatts at 9.6 µm and 10.6 µm, and is often used in the cutting and welding industry. The efficiency of CO2 laser is more than 10%.

Argon ion laser:

It emits light in the wavelength range from 351 nm to 528.7 nm. Depending on the optics and laser tube, a different number of usable lines exist, but the most common lines are 458nm, 488nm and 514.5nm. Nitrogen is an accidental electrical discharge in a gas at atmospheric pressure. Gas lasers are cheap and the resulting ultraviolet radiation has a wavelength of 337.1 nanometers.

Chemical laser

Chemical lasers operate by a chemical reaction and can achieve high powers in a continuous process. For example, in a hydrogen fluoride laser (2700-2900 nm) and a deuterium fluoride laser (3800 nm) the reaction is a combination of… Hydrogen or deuterium gas with metabolites Combustion of ethylene in nitrogen trifluoride. They were invented by George Pimentel.

Solid state laser:

Solid laser materials typically contain "dopers," where a single crystal is dotted with ions that provide the necessary energy. For example, the first working laser was a rubin laser, which was made of sapphire crystal (chromium-aluminum oxide). Chromium or neodymium are also used as alloys. Fiber lasers also belong to the solid state laser category, as they are an effective and practical means. They are used for writing on artifacts and their parts, and are also used for welding metals.

Semiconductor laser:

It is a type of solid state laser, but in conventional laser terminology "solid state laser" excludes semiconductors from this name. Neodymium is a common impurity in various monocrystals, including yttrium, yttrium fluoride, and lithium fluoride Aluminum agate. All of these impurities can produce a laser high in the infrared spectrum with a wavelength of 1064 nm. They are used for metal cutting, welding and marking of metals and other materials, and also in spectroscopy and for laser dye re-pumping. Semiconductor lasers are also commonly used at different frequencies or wavelengths, used to produce 532 nm (green, visible), 355 nm ultraviolet and 266 nm light. Nanometer (ultraviolet rays) when light of these wavelengths is required.

Infrared laser

An infrared laser is usually used as a very short-pulse laser such as a titanium-doped ruby (T: ruby) laser. Thermal limitations in this type of laser can be alleviated by using a laser medium whose thickness is much smaller than the diameter of the pump beam Smh For further thermal gradient in materials and produces up to kilowatts of electricity.

Laser applications:

The laser is used in many and varied magazines because it is very safe and has characteristics that make it an advantage. It is used in medicine, industry, electronic devices, accurately measuring dimensions, merging discs, transferring information accurately and quickly, in agriculture, in sterilization and other applications.

In industry

Lasers are currently used in various fields, such as their use in compact discs, in the electronics industry, measuring distances accurately – especially the dimensions of space objects, and in communications. Laser rays are also used to treat some eye diseases, where high-energy laser rays are directed in the form of flashes at a specific point in the eye for a short time, less than a second. In 1960, he invented a laser device that emits monochromatic, directional rays that can be focused to a high degree by a convex lens. There are also many materials capable of emitting laser beams, including solid materials (ruby and neodymium glass), gaseous materials (helium, neon, and xenon), and semiconductor materials (arsenic, gallium, and indium antimony). Types of laser devices, such as those described above, are used, but they operate at lower powers. Their temperatures reach between 1000 and 1800 degrees Celsius in industry to cut steel plates, the thickness of which may reach 3 cm. Its advantage is that it is cut with extreme precision, as the laser device is directed by a computer. Among the uses of lasers are welding solid, active materials and materials that have a high melting point, with their manufacturing precision due to their firing of a dense, narrow, focused beam. Laser rays can also open a hole with a diameter of 5 micrometers within 200 microseconds in the hardest materials on the planet (diamond, ruby, titanium). During the manufacturing period, there is no change in the nature of the material.

Lasers in medicine

Bloodless surgery, laser wound dressing, surgical treatment, kidney stones, treatment, eye treatment, and dentistry.

Military uses of lasers

Target discrimination, munitions guidance, missile defense.

Other applications

There are also other applications of lasers, the use of lasers in electrical industries, measuring the extent of pollution, geometric conformity, and copying information with high accuracy and speed. It is also used in specifications and measurements, and also in agriculture, in

sterilization and and killing bacteria, and it is used in meteorology and other applications.

Safety from laser risks:

Prevention of laser risks can be achieved in three main ways:

Use absorption filters

In it, light can be absorbed using colored dyes placed inside the materials that make up optical devices, such as glass or plastic, which absorb specific wavelengths.

Use reflective filters

It consists of thin layers of special materials with different light reflection coefficients that are deposited on the glass.

Use Rugate filters

A mixture of fluorides and oxides is placed in layers that have rough edges, and these layers have a gradual change in reflection coefficients, which increases their effectiveness.

Laser is considered a unique method of medical treatment for the following reasons:

• Laser beams can be combined, which allows the light to be focused in the optical fibers, to be transmitted to distant places in the body.

• Laser beams may be produced in pulses, allowing the transmission of thousands of millions in a time of a few seconds in the target area.

• The monochromatic laser, which allows it to efficiently absorb light from some materials, can be directed towards blood vessels to increase photoactivation of light-sensitive materials.

• The laser is used as an alternative to the surgical scalpel, which means there is no bleeding.

Types of lasers used in cosmetology:

There are 6 types of lasers used in cosmetic surgery:

- Vascular laser
- (pigmented laser) pigment laser
- (Resurfacing laser) A laser used for peeling
- Excimer laser
- Laser used for peeling without removing the outer layer of skin
- Laser hair removal

-1 Vascular Laser

- There are several types of wavelengths used in this field, the most famous of which is 595,585 nanometers.

When cells undergo necrosis, their membranes rupture, causing them to enlarge dramatically. Vacuolization, non-condensed chromatin, and disintegrating cellular organelles are hallmarks of abnormal nuclear shape, which is accompanied by enlargement of the mitochondria and rupture of the plasma membrane, which in turn causes the loss of intracellular contents [46]. While radiation-induced necrosis is rare, it can happen in cancer cell lines and tissues.

This type of laser is directed at the substance hemoglobin found in red blood cells. It has many uses, the most important of which is the treatment of birthmarks as well as the expansion of hairs (Haemangioma & Portwin Stain has proven its effectiveness in treating warts and rosacea.q

- -3-2 Dye laser
- Types of lasers used in dyes:
- Ruby 694nm
- Alex 755nm
- Nd YAG 1064nm
- The longer the wave, the deeper the laser becomes and the less it is absorbed by the pigment cells. This device is used in dark birthmarks, Nevus of BakerU”s, and in treating freckles and acne spots. The dye laser uses a dye laser, which is a liquid organic dye dissolved in specific solutions that differ in properties from those. Solid or gaseous materials, dye materials are easily cooled and their most distinctive characteristic is their ability to be tinted, meaning that the wavelengths of a particular dye can vary over a wide range. These organic atoms contain a high concentration of active atoms per unit volume when compared to lasers emitted by gaseous media. The number of effective dye medium is not subject to any damage at high times, which require greater pumping. Organic dye is cheap and requires a small volume.

Preparation method

The active medium for dye lasers is prepared by dissolving a measured amount of the dye material. Dye materials are characterized by their ability to absorb visible light from the electromagnetic spectrum. If the dye laser is pumped by a pulsed laser, the pulse of the beam will be like the pulse of a flash lamp, and if the laser is pumped by a

continuous wave laser, it will be a continuous laser beam. The dye laser can be operated in continuous or pulsed wave modes if the dye lamp is also used as continuous.

—3-3 Laser used for peeling 3Resurfacing Types of lasers used for peeling Erbidum 2940 nm Co2 10.600 nm These devices simply remove the outer layer of skin, and the required depth range can be controlled, as well as the power of the laser to be increased or decreased. Skin tumors can be treated, and the entire face can be peeled to remove superficial wrinkles. This is considered one of the most dangerous laser devices in terms of use, because it may cause complications. Such as bacterial or viral infections or skin scars, if not used correctly.

-3-4 Excimer laser

It is one of the modern lasers that have proven its effectiveness in treating vitiligo, psoriasis, and some other skin conditions. Its wavelength is 540 nanometers. There is no doubt that the benefit of this device is in shortening the treatment period.

3-3-5 The laser used for peeling without removing the outer layer of skin – Non ablative – Resurfacing

This device is considered one of the latest devices used to remove superficial wrinkles on the face. There are more than several wavelengths, the most famous of which are 1450 and 1540 nanometers. The idea in these devices is to heat the lower layer of the skin. The skin, specifically the substance that stimulates fibroblast cells, and then to produce new collagen, Fibroblast Collagen, and we often notice a very slight change before and after laser sessions. It is not recommended to use these devices for dark skin because it may cause dark pigmentation.

-3-6 Laser hair removal

It constitutes more than 80% of laser uses. Laser concentrated light radiation penetrates the skin and hair follicles, where these follicles absorb it. Laser reduces hair density after several sessions at long intervals. The effectiveness of this method depends on the density of hair in the area to be treated and the degree of Hair growth. The thicker the hair, the better the results. Therefore, the treatment is more effective in people with black or dark brown hair because it contains a higher percentage of melanin, which absorbs light to a greater extent. The method of using lasers to remove unwanted hair in the face and areas has been proven. Its effectiveness, speed, and ease of use within a few minutes (one session takes 20-30 minutes), and without the possibility of complications such as infections or scarring on the skin after hair removal, which made the demand for it increase greatly, and the idea of laser work is based on This field involves burning or damaging the hair follicle by shining laser rays that are absorbed by melanin, which is present in high concentration in the hair. Laser is also useful in removing birthmarks, scars, skin tumors, and tattoos, softening the skin, and getting rid of the effects of acne and wrinkles.

3-4 layers of skin:

From the outside to the inside, the skin consists of three distinct layers: the epidermis, the dermis, and the subdermis. The epidermis layer is the outer layer of the skin. There are other cells between the skin cells that differ in form and function. They are called pigment cells or melanocytes, which secrete melanin, which gives the skin its distinctive color. The skin has components that modify part of the skin cells, such as the hair follicle, which produces hair, the sebaceous glands, which secrete fats that cover the surface of the skin to protect it from dryness, as well as the nails and sweat glands.

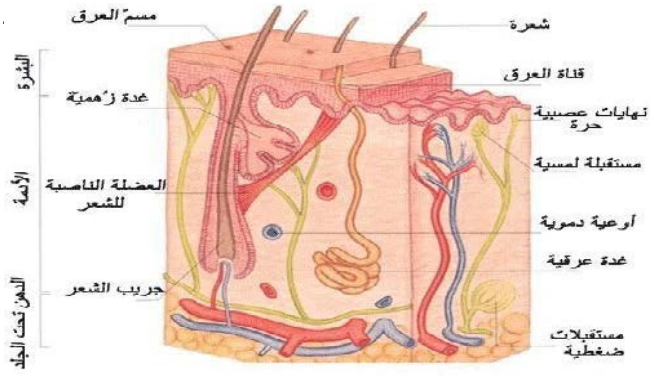

Figure (3-4) Layers of the skin

-5Human skin and laser:

The nature of the interference of all types of lasers with living tissue can be explained according to the following terms:

3-5-1 Reflection:

-There is always a degree of reflection of the laser light from the skin (Epidermis).

-3-5-2 Transmission and diffraction

-The laser light crosses and penetrates the skin and deep tissues. This absorption occurs by the target tissue according to special types of lasers. The absorbed laser light causes coagulation, cutting, or evaporation in the tissue, and in a distinctive way, the laser light reaches its specific target, such as pigment, pigment, and water.

-3-5-3 Tissue coagulation

-It is related to the thermal effect, as converting the laser power into heat causes coagulation and blocking of blood vessels, or cauterization, with less coagulation occurring with heat above 54 degrees Celsius.

-3-5-4 Fabric evaporation:

- It occurs at temperatures higher than 100 degrees Celsius, especially due to the rapid transfer of heat from the laser light to the tissue. This may lead to boiling in the cellular fluid and complete destruction of the cellular protein and the cell itself. The vapor of these evaporated tissues causes a yellowish drop of about one micron. It is also important to use a special laser mask when peeling or removing skin lesions. The heat emitted depends directly on the interaction of atoms and moving molecules and excitation, as when the temperature rises from 100-40 degrees Celsius, most proteins, DNA, RNA, membranes, and cell contents begin to melt and dissolve Coagulation depends On the evaporation of tissue water, as water is the target in these types of laser devices. 2CO laser. Some other lasers target skin pigment such as melanocytes and blood vessels, including tattoos.

Laser applications in cosmetology:

Laser has many applications in the world of cosmetics and dermatology. It is used in treating skin problems, scars, and irritation resulting from acne, freckles, melasma, wrinkles, removing tattoos, removing pimples, birthmarks, and the effects of burns, hair removal, smoothing, eyelid patching, removing lip lines, and face lift and straightening its surface, Removal of red spots, also known as age spots, hematomas associated with aging, removal of pigmentation, and removal of adipose tissue. Modern technologies in the field of using laser rays to treat the skin have allowed the possibility of removing thin layers of skin and fixing fine lines in it. Laser rays vaporize very thin layers of tissue while reducing the effect of thermal shock, and therefore the outer layer of the skin is removed (skin sanding). The base (dermis) can be fixed to give a more youthful appearance and wrinkles are reduced and eliminated.

Treatment of skin diseases

It is used to treat skin lesions using argon laser and carbon dioxide laser. Argon laser. The argon laser gives off a strong blue light mixed with green light between 488 and 514 nanometers, which is absorbed by hemoglobin and by colored molecules in the superficial layers of the skin (dermis). Dermatologists use the argon laser to treat colored skin problems such as red spots, red spots and hematomas. Yes Accompanying old age. The carbon dioxide device is used in dermatological and cosmetic surgeries with a high power of up to 100 watts.

Eyelid patching

The laser works as a precise tool to remove damaged skin while reducing the area of bleeding. It also removes fatty bags located under the eyes, leaving no visible scars for people. In this type of application, the carbon dioxide laser and the Erbidium laser 3-6-5 are used for hair removal using a laser. The laser industry has given priority to laser treatment over other methods, especially in the field of hair removal, where the use of laser for hair removal is considered the only and optimal solution now. The only problem faced In using laser hair removal is that the pigment cells present in the hair that we want to destroy are the same pigment cells present in the skin tissues whose integrity we want to preserve, but it was solved by inventing a device called (the Alexandrite device). The Scandinavian laser device is considered the only device that enables laser rays to affect the pigment cells in the hair while completely preserving the pigment cells in the skin. Another advantage of this device is that it can treat chronic inflammation Of the chin in men due to shaving. Hair removal does not occur in

one session. Rather, it requires 3-5 sessions between the session and the next, 6-8 weeks after which about 80% to 90% of the hair disappears. Laser rays for hair removal usually do not go beyond the surface layer of the skin and cannot penetrate and reach the uterus at all, even if it is done. Removing hair from the abdomen of a pregnant woman is permissible and does not represent any danger to the pregnant woman or her fetus. We often use it for pregnant women and there is no negative effect.

Hair acquires its color with the presence of a high concentration of dye. Dye, according to its scientific definition, is a substance that absorbs light. If the dye absorbs all colors of light (all wavelengths), the hair is black. If it reflects all colors of light, the hair is white, and a black body absorbs more heat using… In this principle, a light source was designed that emits a high-power light pulse, and the pulse can be controlled and continued. This is why the pulse can be controlled and continued, and this pulse can be directed to treat hair of any color. The process of photolysis hair removal depends on a precise physical principle, which is the difference in light absorption Between Skin dye and hair dye. The best treatment conditions are available to those with light skin and dark hair. When the light pulse resulting from the laser device is directed at the surface of the skin, it filters and passes what is under the skin, just as light filters on the surface of a lake that passes into its depths. This light is absorbed by the hair follicles, and this is done in a selective manner, meaning that the hair follicles have a greater tendency to a certain type of light in terms of color or wavelength. The rapid selective absorption of the light plant produces heat that destroys the hair at its roots.

Actions taken by the patient after the laser:

1. There may be a slight degree of redness after laser treatment.
2. Usually apply cold compresses for 5-10 minutes to relieve pain and redness.
3. A quartzone cream can be applied after cold compresses for two days.
4. It is allowed to shower after the laser, but gently, without scratching.
5. Cosmetic materials can be used the day after the laser procedure.
6. Do not forget to apply sunscreen frequently and for several weeks.

Recommendations

• The doctor and patient must make their own decisions regarding all treatment options.
• The surgeon should discuss with the patient the options for anesthesia and the location where the treatment will be performed.
• The doctor must discuss with the patient all treatment costs.
• The skin must be cleaned well using a solution to remove oils before skin peeling or any other cosmetic procedure.
• The skin must be lubricated with ointment in order to maintain its suppleness and smoothness during the first ten days of the operation.
• The doctor must follow a light diet after the operation.

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