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MODERN IMPLANTOLOGY

Boykobilov Soatmurod Shukhrat o'g'li.
Lecturer at the Department of Natural Sciences, Termez University of Economics and Service

Email: soatmurad_boyqobilov@tues.uz

Nazarova Ibodat Khasanovna

Student at Termez University of Economics and Service

Erniyozova Umida Omon qizi.

Student at Termez University of Economics and Service

Annotation

Along with modern implant technology, there have been many innovations in the field of dental health. One of these innovations is implant treatment. Implantation is a treatment method that replaces missing teeth and offers a functional and aesthetic solution. This article provides information about the new modern types of implants used around the world, their advantages and disadvantages, as well as how the implant is used and depends on the age of the person.

Keywords: implantology, modern implant, subperiosteal, transcostal, intracostal, tooth, metal implant, ceramic implant, screw implant.

Аннотация

Наряду с современными технологиями имплантации появилось множество инноваций в сфере стоматологического здоровья. Одной из таких инноваций является имплантологическое лечение. Имплантация – это метод лечения, который заменяет отсутствующие зубы и предлагает функциональное и эстетическое решение. В данной статье представлена информация о новых современных типах имплантатов, используемых во всем мире, их преимуществах и недостатках, а также о том, как имплантат используется и зависит от возраста человека.

Ключевые слова: имплантология, современный имплантат, подпереостальный, транскостальный, внутриреберный, зуб, металлический имплантат, керамический имплантат, винтовой имплантат.

Introduction. Along with modern implant technology, there have been many innovations in the field of dental health. One of these innovations is implant treatment.

An implant is a treatment method that replaces missing teeth and offers a functional and aesthetic solution. Implantation treatment is usually carried out in several stages.

In the first stage, the dentist examines the place where the implant will be installed and assesses its suitability. The quality and quantity of the jaw bone are checked using the necessary X-rays and other imaging techniques. The implant is then installed into the jawbone. A healing period of several months is required for the implant to fuse with the jawbone. During this time, a strong connection with the jawbone is formed around the implant. Once the healing process is complete, the temporary prosthesis provides the patient with comfort in terms of aesthetics and functionality for the installation of the prosthesis on the implant. At the final stage, a permanent prosthesis is installed on the implant. The prosthetic tooth is made individually according to the size of the patient's other teeth. Thus, the implant acquires an aesthetic appearance similar to natural teeth.

Fig 1. Implant

History of modern implantology

Modern implantology - Dental implants were invented by Swedish orthopedic surgeon and research professor **Per-Ingvar Brånemark.** He is called the "father of modern dental implantology."

Early in his career, he studied how blood flow affects bone repair.

In 1952, he and his team implanted titanium-coated optical instruments into the lower legs of rabbits to study the healing process. At the end of the study period, when they went to remove the instruments, they were surprised to find that the titanium had fused to the bone and could not be removed.

Pierre-Ingvar Branemark

(1929-2014)

Dr. Brånemark called this process "osseointegration," and his research took a completely new direction as he realized that if the body could tolerate the long-term presence of titanium, the metal could be used to create anchors for artificial teeth. Over the years, Dr. Brånemark's applications for grants to study bone grafts were rejected. The project was eventually funded by the US National Institutes of Health, and Branemark implants were approved by the Swedish National Board of Health and Welfare in the 1970s .

Today, dental implants are considered to be replacements for tooth roots. They replace a lost tooth root.

Main part

An implant is a titanium metal screw that replaces the root of a tooth. Implants act as an anchor, a strong foundation for fixing permanent or removable artificial (false) teeth:

- Gear bridge.

- Dental crown.

- Teeth.

Classification of modern types of implants

Classification criteria	Types of implants

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Bonding of implants Location	• Subpereostal • transostal • intraosseous

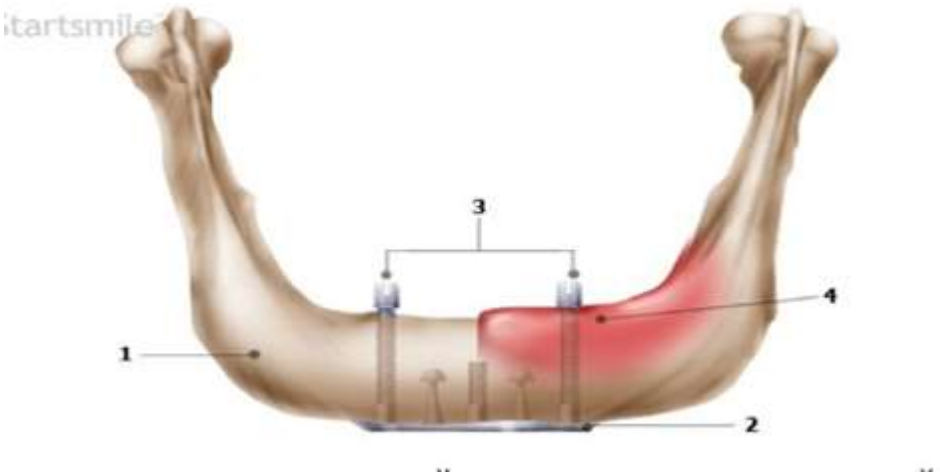

Fig 2. Subperosteal implant

Fig. 3. Transosseous implant

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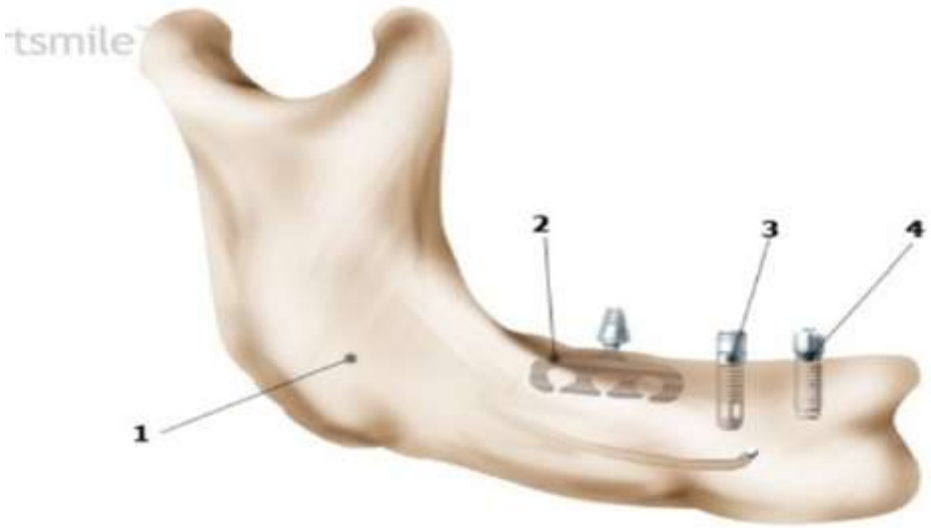

Figure 4. Endosseous implant

Most people mistake an implant for a "finished tooth." What is an implant? This is a reliable support for an artificial root and crown. Titanium screws with a diameter of 3-5 mm are placed in bone tissue, do not cause allergies and are practically not rejected by the human body. Implantation on the upper jaw and/or lower jaw, in the smile area - today it is possible to restore not only functionality, but also an aesthetic appearance. The screw is made of pure titanium. The material takes root well, the risk of rejection by the body is minimal, and can withstand high chewing loads. A dental implant is a product that, depending on its design, can be disassembled or not. The assembled structures consist of the body itself, a cover screw, a healing support, a cover and a head. The non-separable model is a single piece and is used for immediate implantation.

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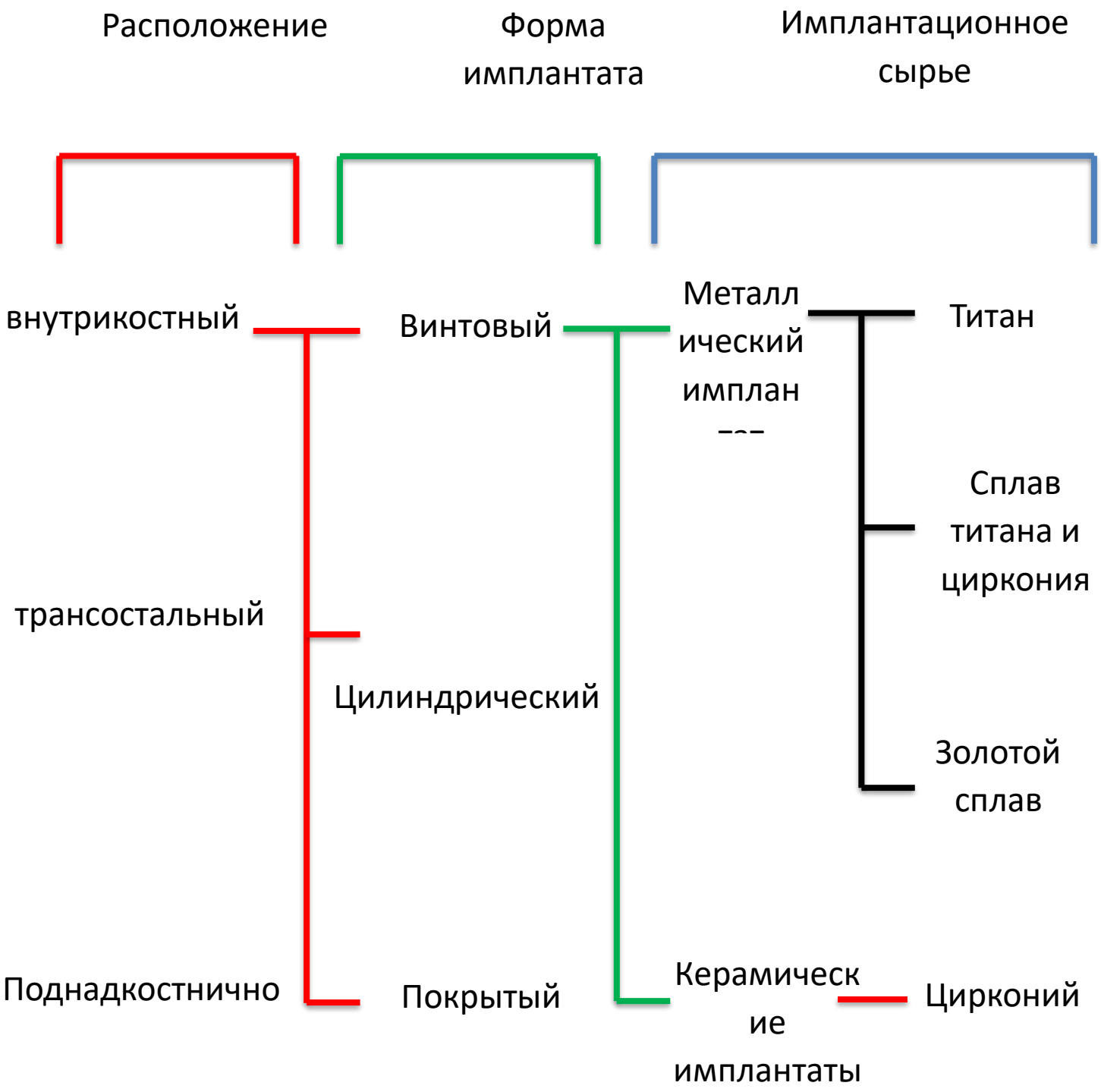

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Modern parts of the implant

1. Artificial root "implant" of the internal part (6 or 8 six-cranial ribs in the internal part)
2. Abadman
3. 3. screw
4. Karonka

Advantages and disadvantages of implant treatment

I. Treatment of one missing tooth
II. Treatment of multiple missing teeth
III. Treatment of complete edentia

Advantages and disadvantages of implant treatment

I. Treatment of one missing tooth
II. Treatment of multiple missing teeth
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Implantation of one missing tooth

I. **Advantage:** placing bone in the area of the right tooth while preserving the adjacent teeth.
II. Good for long term use
III. Chewing ability is almost close to natural teeth.
IV. Duration of treatment is 3-6 months.
V. **Disadvantage:** high initial cost.

Bridge prosthesis

I. **Advantage:** short treatment time, low cost.
II. **Disadvantage:** replacement every 5-10 years.
III. Making a bridge by sharpening two adjacent teeth.
IV. Since the teeth do not have roots, the chewing pressure is weak, so the pressure is put on the adjacent teeth, which is a long-term injury.

Treatment of multiple missing teeth: Implantation

I. **Advantage:** not visible when laughing
II. Chewing pressure is the same as in natural teeth.
III. Duration of treatment is 3-6 months.
IV. Easy to use for a long time
V. **Disadvantage:** high initial cost.

Partially removable denture

I. **Disadvantage:** when you smile, the edge of the prosthesis is visible.
II. With prolonged use, bone resorption occurs as a result of pressure on the gums.
III. A removable partial denture should be fabricated and secured.
IV. It is necessary to change the prosthesis every 2-5 years.

Treatment of complete edentia Implant

I. **Advantage:** strong connection or column preparation.
II. Installation of multiple implants for stability
III. Chewing pressure is the same as in natural teeth.
IV. Easy to use for a long time
V. **Disadvantage:** treatment duration is 3-6 months.
VI. Starting price is high

Without implants

I. **Advantage:** The treatment duration is short.
II. **Disadvantage:** with long-term use, resorption in the alveolar bone continues.
III. Damage to the bones makes the facial profile unsightly.
IV. It is difficult to eat food that is difficult and difficult to chew.
V. It should be replaced every 3-4 years.

Modern types of implants

Figure 5. Advantage of the Ossem implant

1. To install a crown, it is not necessary to drill (drill) into nearby teeth. Implantation restores teeth with complete edentia (without a tooth) using All - on -4 or All - on -6 technology.

2. The crown installed on the implant is a complete analogue of the tooth. Looks natural and chews food well.

3. No dietary restrictions, you can safely eat solid food: the head does not vibrate.

4. Caring for a crown installed on an implant is no different from a regular brush.

Types of osstemal implants

The model range of Osstem implants is represented by the following series:

- **TC** – classic, studded thread, different diameters. There are **four different attachment options for the upper and lower jaw with different levels of bone density** . Implants in this series undergo additional treatment with acid and sand. They have a rough, almost porous surface.
- **SS III S.A.** – implants are installed **in one step** , immediately after tooth extraction. The stability of the system has been increased, which eliminates loosening and breakage.
- **MC** – has a solid body and support. The small diameter design is designed for installation in **thin bone. At the same time,** MS line prostheses are very durable and can withstand high loads.
- **ET** is a product of a subsidiary and is manufactured in the USA. **The implants have microthreads and a sealed plug** that prevents the penetration of pathogens and bacteria.

Figure 6. Advantages of ICX and Ankylos implants

Increased tissue stability

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Subcrestal implant placement combined with horizontal offset and concave abutment design creates an ideal three-dimensional space for the growth and maintenance of healthy tissue and bone.

Constant tissue stability

Over 55,000 implants and over 20,000 patients over 20 years have been studied, with implant survival rates of >97% at 5+ years, with stable bone levels confirmed at 5–12 years of follow-up.

Preservation of the crestal bone

The thread design matches the function of the bone, making it easier to insert and helping to preserve the bone ridge. Provides default stability and instant loading.

Early osseointegration and rapid bone formation

The surface, cleaned and treated with high temperature, ensures a good connection between the bone and the implant and accelerates bone formation.

Simplified treatment process

TissueCare joint eliminates micro-movement while enhancing frictional retention, reducing the risk of bacterial growth and inflammation.

Raw materials for implants

Biocompatible materials

V. Cobalt alloy (Ti - Co - Cr - Mo)

The main composition is Titanium, cobalt-chromium-molybdenum "KKM".

Mainly used in orthopedic implants.

However, due to its low ductility, quality control is important.

Orthopedic femoral implant (**Fig. 7**) Dental implant

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Ashio ceramics are the most durable ceramics used in dentistry.

(The technique has higher strength than soft titanium).

Comparison of the durability of biocompatible materials during implantation.

-Titanium alloy (Gr.5)

- Tantalum

- Cobalt is an alloy of cobalt.

-Zirconium

-Titanium (Gr.1~4)

Titanium implants of strength level (Gr.1~4) are used in Uzbekistan.

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