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What Is A Ceramic Metal Crown

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Abstract: A few decades ago, it was difficult to combine reliability and aesthetics in dental prosthetics. Crowns made of dental and precious alloys were installed on the molars. Metal with plastic coating was used as a budget material for the smile area. For more expensive prosthetics—beautiful but fragile porcelain is used. Gold dentures on the front teeth were considered a valid option, although they age a person by at least 10 years.

Keywords: Dental prosthetics, plastic coating, expensive prosthetics.

Introduction: A few decades ago, it was difficult to combine reliability and aesthetics in dental prosthetics. Crowns made of dental and precious alloys were installed on the molars. Metal with plastic coating was used as a budget material for the smile area. For more expensive prosthetics—beautiful but fragile porcelain is used. Gold dentures on the front teeth were considered a valid option, although they age a person by at least 10 years.

Thanks to the invention of metal ceramics, it became possible to combine strength and aesthetics in one material. The metal frame gives the structure strength, and the ceramic coating makes the crown as close in appearance as possible to a natural human tooth.

The process of manufacturing a ceramic metal crown takes place in several stages:

1. A metal base is cast. Most often made of chromium-nickel alloy, but it is possible to use precious materials.
2. Layers of ceramic mass are applied from above, followed by firing. The first layers overlap the gray color of the metal. The subsequent ones create a natural shade of enamel, which is selected individually according to the color palette. Ceramic layers are

applied so that the cutting edge of the crown has a transparency similar to the natural one.

3. The final stage is coating the finished product with glaze. It has protective and aesthetic functions, giving the surface a polished sheen.

The third stage is performed after the final fitting of the prosthesis "on the patient".

Pros and cons of a ceramic metal crown

Positive



The prosthesis is characterized by wear resistance and durability – it perfectly withstands chewing, does not wear off over time, and its color does not change. The service life of such structures is 10-15 years.

The ceramic coating looks like natural enamel. It is possible to select the color that is as close as possible to the natural shade of the patient's teeth.

If a small ceramic chip occurs, its restoration is possible directly in the patient's mouth with light-curing materials. In fact, metal ceramics are "sealed".

The cost of a ceramic-metal crown made of chromium-nickel alloy is relatively low.

Minuses

The most significant disadvantage is the rather large thickness of the entire cap. It consists of a metal thickness (from 0.3 mm) and a ceramic layer (about 0.8 mm). On average, the wall of the prosthesis is 1.1–1.5 mm. Therefore, the tooth for such a crown needs to be sharpened on all sides by the same 1.1–1.5 mm, and this is quite a lot. Severe stitching of hard tissues imposes certain restrictions on the prosthetics process.

There are also some disadvantages in terms of aesthetics.

Human enamel is translucent, and the ceramic coating, when applied to metal, loses its transparency. Therefore, the prosthesis has a good, but not perfect appearance. For example, crowns made of pressed

ceramics or zirconium dioxide are close to enamel not only in color, but also in the degree of transparency.

The second aesthetic disadvantage is the exposure of the metal base when the gum subsides over time. This defect does not always occur, but it is still not so rare.

The base metal frame has a low allergenicity, but in rare cases it can cause allergic reactions. It can also be oxidized by saliva.

Indications and contraindications

The installation of a ceramic metal crown is indicated in such cases:

- Significant destruction of the patient's natural crown. In this case, the artificial crown performs a protective and aesthetic function.
- Prosthetics on an implant or a stump tab.
- Defects in the anterior and anterolateral sections of the patient's dentition.
- Allergy to plastics.

Contraindications:

- Prosthetics for children and adolescents.
- Increased tooth wear.
- Low, shallow, flat and thin-walled natural crowns. In these cases, it is impossible to cut the hard tissues of the tooth to the thickness of the metal-ceramic cap.
- The need to fill in large gaps when installing a bridge

(from 3-4 units). In this case, a heavy load on the "bridge" can lead to ceramic chips.

- Some malocclusion.

The question of the need for tooth depulcation is decided by the doctor.

Is it possible to put metal-ceramic crowns on the front

teeth?

Patients often ask this question. The answer is yes, this type of prosthesis is universal. It can be installed on any unit of the dentition – incisors, molars and premolars.

Types of metal-ceramic crowns



They are mainly classified based on which materials are used in the manufacture of the base.:

1. On base-value alloys. This is the most common type of product. It has a relatively low cost. However, the disadvantages described above relate specifically to this type of structure.

2. Gold ceramics. It is made on the basis of gold and its alloys. The golden frame does not oxidize, does not cause allergies. It has a longer service life. A smaller number of ceramic layers must be applied to the base, since even slightly shining through the ceramic coating, gold gives a natural yellowish, rather than a gray-bluish hue. As a result, the gold-ceramic cap is thinner, which means it requires less teeth grinding. The fit on the tooth is more accurate – the gap between the base of the crown and the tooth is about 50 microns. For ordinary metal ceramics – 100 microns. The disadvantage is the high price. It is 2 times higher than that of the base alloy construction.

3. Titanium base. It is an absolutely biocompatible metal – it does not cause allergies and does not oxidize. Lightweight, which is important in the manufacture of extended bridge-like structures. When prosthetics are performed on titanium implants, it is fully compatible with them. Minus titanium is quite difficult to work with, and also requires the use of specialized ceramics during coating. The price of titanium cermet is also relatively high.

A good option is metal ceramics with a solid porcelain edge (shoulder mass). When the gum subsides in such a prosthesis, the metal edge will never be exposed. This technology is more complex and requires special skills from a dental technician.

The stages of prosthetic installation

They differ slightly depending on the type of prosthetics, but are generally similar.

If a crown is placed on the tooth, the orthopedist evaluates the need for its depulcation. If it is needed, the patient seals the channels at the dentist-therapist, then returns to the orthopedist, who performs tooth sharpening.

Then a cast of the patient's jaw is taken and sent to a dental laboratory, where a crown is made. Then the orthopedist adjusts it directly in the patient's mouth, and sends it for glazing. The final stage is the installation of the prosthesis on a special cement.

In prosthetics based on a stump insert, the process is similar to the previous one, only a metal stump insert serves as a "ground tooth".

The installation of a crown is the final stage of implant-based prosthetics.

Before making it, an impression is also taken – digitally (by scanning) or a classic one, using a solidifying plastic mass. The crown is fixed to the abutment using cement or screws.

Care of a metal-ceramic prosthesis

Cermets require the same hygiene as natural teeth. Dentures are cleaned 2 times a day. However, do not use abrasive or bleaching pastes that can damage the ceramic coating.

Dentists recommend using an irrigator, which will carefully remove food residues in the interdental spaces. You need to use it 2-3 times a week.

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