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Amalgam and Composite Fillings

INFORMATION SHEET

Amalgam and composite fillings

Because many patients ask for dental restorations with no metal or metal alloy, dentists often use composites ("white fillings"). For a number of years, increasingly effective adhesive techniques have made it possible to perform restorations of posterior (back) teeth using composite, an esthetically valuable alternative to amalgam.

The reality

When a cavity is detected, dentists need to remove it then make a repair that provides the best compromise between chewing, appearance and safety, and best possible durability. There are currently two materials used for this: amalgam ("silver filling") which, despite current debate, is still an invaluable product, and composite (direct filling), which is more modern but not without its inconveniences. Both restoration materials are often found in the same mouth.

The variety of clinical situations involving posterior tooth restoration requires a well-thought-out approach to choosing one of the techniques. Based on a clinical exam and X-ray, the dentist makes a relevant therapeutic decision, with the choice based on functional restoration, varying durability and, in some cases, appearance. Obviously, restorations using modern composites—with esthetic and functional qualities which are valid replacements for traditional metal fillings—can be very appealing treatment options. However, the pros and cons must always be considered and, above all, it is important to be familiar with the types of materials.

All about amalgam

Often incorrectly called "lead" fillings, amalgam is the most traditional material. Available for over a century for restoring teeth, amalgam is made of an alloy of silver (~22-32%), tin (~14%) and copper (~8%) combined with mercury. These ingredients are combined to produce a "paste" which hardens once it has been put in place. This material is not very attractive but it combines excellent resistance to abrasion (wear and tear) with excellent durability.

Amalgam is very reliable and durable for treating posterior teeth subject to mechanical forces. As well, over time, amalgam has the valuable property of self-sealing and becoming watertight.

There has been some controversy in recent years about its potential toxicity because of the mercury content. Although the scientific literature shows that dental amalgam does not pose significant health risks, it's important to provide a few details.

- The mercy in amalgam is enclosed within its structure. Tiny amounts are released in the saliva when chewing, at levels far below what is contained in some foods, such as fish.
- Like any substance, mercury may cause allergic reactions; the dentist needs to determine the likelihood of a sensitivity. In most cases, mercury hypersensitivity reactions present as lichenoid reactions (white spots, red patches, papules, ulcers) on mucous membranes directly in contact with the amalgam after a prolonged period. More systemic allergic reactions (swelling or hives) which occur immediately after placement of an amalgam filling are very rare and usually short-lasting.
- Exposure to mercury from any source may be of particular concern to patients with specific medical conditions. Even though dental amalgam is not related to those conditions, caution is advised in patients sensitive/allergic to one of the components in amalgam, patients with lichen planus and patients with severely impaired kidney function. Consequently, the only clinically acceptable reason for removing an amalgam is to replace it for a medical reason.
- The risks and benefits of choosing a restoration material must be carefully considered for women who are pregnant/breastfeeding and children. In many cases, amalgam may be the best option. Even if scientific evidence does not exclude a group of patients for amalgam use, caution is advised. Insofar as possible, treatments are avoided during pregnancy and breastfeeding and alternatives to amalgam are considered in children.

All about composite

Amalgam and composite are often incorrectly compared, since the latter is a more recent material. Composites are esthetically pleasing and blend in naturally since they come in a multitude of shades. Initially, they were used for anterior (front) teeth; the development of composites more resist to wear and tear and fractures has made it possible to extend their indications to posterior (back) teeth. Composites are a paste (resin) containing microparticles and macroparticles made up of quartz, silica and zirconium. They are not without their disadvantages: sensitivity to contamination during placement, resistance to abrasion is relatively good, varying watertightness, some components are potential irritants or allergens. Microscopic cracks that allow bacteria to infiltrate between the filling and tooth are the main cause of post-operative pain and repeat cavities. All composites retract under the effect of polymerization (transformation into a solid) and none of these materials has the durable self-sealing characteristic of amalgam. Using composite on a posterior tooth is a more complex procedure, requiring more time, and is more difficult to do than with amalgam; as a result, it is more costly.

Should amalgam fillings in good condition be systematically replaced?

There are no good reasons for systematically replacing amalgam fillings. Amalgam is still an excellent dental restoration material; one of its main qualities is its durability. It provides satisfactory watertightness between the tooth and filling and, as a result, limits or prevents repeat cavities. Amalgam reconstructs high-quality interdental points of contact, which protects the gums. Its resistance to pressure and abrasion mean that it stands up to the mechanical load involved in chewing.

Functional amalgam fillings should only be replaced if there is a medical reason or a genuine clinical need to restore a tooth.

Patients should be made aware of the challenges. It's important to keep in mind that the materials used currently for dental restoration, including amalgam, are safe and effective.

Everything you need to know about composites when restoring a posterior (back) tooth

Indications for posterior composites

- Prevention.
- Conservative treatment for small cavities.
- Preservation of the integrity of the tooth's structure.
- Structural integrity of the tooth is at risk (risk of fracture).
- Patient's decision to have a non-metal filling.

Contraindications for posterior composites

- Not possible to achieve and maintain a suitably isolated operating field.
- Excessive occlusal function.
- Hyperfunction (teeth clenching, grinding, etc.).
- Extent of the cavity under the gum.

Problems encountered with composites (direct filling)

- Post-operative sensitivity
  1. Immediate sensitivity: normal, temporary sensitivity relieved by painkillers.
  2. Permanent sensitivity: this kind of sensitivity is primarily associated with operating technique.
     - Thermal sensitivity: especially to cold, related to the material not being watertight.
     - Mechanical sensitivity: especially to pressure, associated with the force of chewing.
- Attached around the restoration, especially in places where there is no more dental enamel (e.g. under the gum).
- Sometimes hard to achieve a point of contact between two adjacent teeth.
- Clinical longevity: when there are extensive fillings involving several surfaces of the tooth, composites have a shorter average lifespan than amalgams.

I gave this information sheet to patient (name): _____

Date: _____ Dentist's signature: _____

Please note that the scientific content in this sheet was reviewed and adapted in line with scientific knowledge and recognized best dental medicine practices at the time of publication (January 2024).