

REVIEW ON 'DENTAL CAVITY CURE TREATMENTS FOLLOWED BY SURGERY'- RESEARCH GAP OF SURGERY LESS CAVITY CURE TREATMENT AND SINGLE LAYER NANOMATERIAL COATING TO CAVITY WITH CHEAPER WAY RESEARCH

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Article History

Received: 05/01/2024

Accepted: 24/01/2024

Article ID: RRBB/201

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Abstract

Oral diseases are the most common diseases in the world, Oral health is essential to total health and satisfactory quality of life. Tooth cavity is one of them. Tooth cavities, also known as dental caries, are a prevalent oral health issue affecting individuals of all age groups worldwide. This review paper summarizes mainly the surgical treatments use in treatment of cavity which are very painful. These treatments are very costly. And there are many benefits and drawbacks of these treatments in this review these surgical treatments are not disqualified instead of that newly painless surgery less treatment is trying to introduce. Using of Green synthesis nanoparticles and signal layer coating material treatment is trying to introduce.

Keywords-Fluoride Treatment, Filling Treatment, Crown Treatment, Root Canal, Tooth Extraction Nanoparticle, Graphene Research

Introduction

Cavities are permanently damaged areas in the hard surface of your teeth that develop into tiny openings or holes. Cavities, also called tooth decay or caries, are caused by a combination of factors, including bacteria in your mouth, frequent snacking, sipping sugary drinks and not cleaning your teeth well. To cure cavity there are many surgery treatments are available these are very painful. In This review fluoride treatment is included which helps to restore cavity. Fluoride treatment is included in which fluoride are used to cure cavity. Fluorides helps to restore tooth's enamel. Fluoride apply in the form of toothpaste which kill the germs but excessive use can harm. Filling treatment use the filling materials to fill the cavity. hole is done by surgery' in tooth cavity and amalgam, composite, Ceramic materials are full up. In crown Treatment tooth shape cap is fit

on decayed teeth after removal of cavity by drilling machine. Root canal is one of the treatment is helping at the time of the cavity spread full inside the teeth at depth. Tooth extraction is the treatment in which decayed teeth is completely recovered from root surgically. Instead of that the continue disposition treatment of antimicrobial material can cure the cavity without surgery. If the graphene like single layer material can use in treatment, then coating will be best treatment Crown Treatment Root canal will be optional.

Fluoride treatments

If your cavity just started, a fluoride treatment may help restore your tooth's enamel and can sometimes reverse a cavity in the very early stages. Professional fluoride treatments contain more fluoride than the amount found in tap

water, toothpaste and mouth rinses. Fluoride treatments may be liquid, gel, foam or varnish that's brushed onto your teeth or placed in a small tray that fits over your teeth. Fluoride also inhibits enamel demineralization. The calcium fluoride that is deposited on a tooth surface after fluoride therapy is not readily soluble and can act as a fluoride reservoir. This fluoride also can lower the critical pH value of hydroxyapatite crystal dissolution (the pH value at the time that demineralization occurs) from approximately 5.5 to 4.5 in the mouth. In addition, fluoride can be incorporated incrementally into fluoridated crystals on the tooth surface, making the surface more resistant to acid dissolution. In addition to inhibiting demineralization, fluoride enhances enamel remineralization, increasing the speed of the remineralization process and the mineral content of carious lesions. The incorporation of

fluoride also makes the deposited mineral less acid-soluble. The common fluoride compounds used in topical fluoride agents include sodium fluoride (NaF). Which can be acidulated and buffered with a phosphate to form acidulated phosphate fluoride (APF); sodium monofluorophosphate (MFP) (Na, FPO); and stannous fluoride (SnF). Hexafluoride silicic acid (H, SiF) and sodium silicofluoride (Na-SiF) are used commonly in water fluoridation. Dental researchers are investigating other fluoride compounds, such as silver diamine fluoride (Ag(NH), F) and titanium tetrafluoride (TIF) for controlling caries. Common methods for delivering fluoride include water fluoride-tion, fluoridated salt, fluoridated milk, fluoride toothpaste, fluoride supplements (in the form of a drop or tablet), fluoride chewing gum,

Fluoride concentration found in common fluoride delivery system (in ppm)

Delivery system	Fluoride concentration
Water fluoridation	0.5–1.0
Fluoridated salt	250
Fluoridated milk	2.5–5.0
Fluoride drop, tablet, or chewing gum.	0.25 mg per drop, tablet

There is an increased risk of developing mild forms of dental fluorosis when fluorides are used by young children. The risk of young children developing dental caries must be assessed before fluorides are administered for caries prevention.

Filling Treatment

Tooth decay is one of the most common diseases in the oral and maxillofacial region and 29% to 59% of individuals over the age of 50 experience it at least once (1). Depending on the type of decay and its intensity, decayed teeth are either restored or replaced with implants. Filling is the most common treatment for decayed teeth and amalgam and composite fillings are used most commonly as dental filling materials. Dental cavity represents one of the widespread illnesses of the tooth. Method for treating of the tooth is to drill the cavity and to fill the hole with suitable material.

Measurements show that during drilling the tooth vibrates with increasing mass that causes unpleasant feeling for patient. Dental amalgam is a dental filling material used to fill cavities caused by tooth decay.

1) Dental amalgam

Certainly, the most common material for dental fillings is a silver amalgam made of silver combined with tin, zinc, copper, and mercury. These are popular for many reasons, but largely because, as WebMD puts it, "they're long-lasting and relatively inexpensive." There are some noted drawbacks to silver amalgam fillings. Some people find them less aesthetically pleasing than other dental filling materials, as they are clearly silver in appearance. The mercury contained in the amalgam releases low levels of mercury in the form of a vapor that can be inhaled and absorbed by the lungs. High levels of mercury

vapor exposure are associated with adverse effects in the brain and the kidneys. Studies have found no link between the amalgam fillings and health problems and the FDA considers them safe for adults and children ages 6 and above.

2) Composite

Composite resin is an excellent material for dental fillings, and its popularity continues to grow. These fillings are aesthetically attractive, as they can be created to match your existing tooth color. They are often used for front teeth, as they can easily blend in with your natural teeth. Composite fillings are more expensive than silver amalgam, and there are some concerns about durability. Composite fillings wear out sooner than amalgam fillings (lasting at least five years compared with at least 10 to 15 for amalgams); in addition, they may not last as long as amalgam fillings under the pressure of chewing and particularly if used for large cavities. Even with these concerns, composite fillings are amongst the best filling options for front teeth.

3) Ceramic

Another great dental filling option for front teeth is fillings made of porcelain. Generally referred to as ceramic fillings, porcelain is stain-resistant and long-lasting. Like composite fillings, ceramics can be color-matched to your existing teeth. Ceramic fillings are much more expensive than silver amalgam fillings, and more expensive than composite fillings as well. If they are within the budget, ceramic is an excellent material for dental fillings.

Crown Treatment

A dental crown is a tooth-shaped cap. Dentists use crowns to restore weak, broken or decayed teeth. A crown fits over your entire tooth, like a snug hat. To ensure a proper fit, a dentist will need to remove a small amount of enamel before bonding your new crown in place. You may need a dental crown to: Strengthen a weak tooth. Protect and support a cracked tooth.

Restore a worn-down or broken tooth. Hold a dental bridge in place. Cover a severely stained or discolored tooth. Cover a root canal-treated tooth. Cover a dental implant. There are many types of dental crowns. The kind that's right for you depends on your personal preferences and unique oral health needs.

1) Metal crowns

Dental technicians use several metals to make dental crowns, including gold, palladium, nickel and chromium. Metal crowns rarely chip or break, last the longest in terms of wear and only require a small amount of enamel removal. They can also withstand biting and chewing forces. The metallic color is the main drawback of this type of crown. Metal crowns are a good choice for out-of-sight molars.

2) Porcelain-fused-to-metal (PFM) crowns

Porcelain-fused-to-metal (PFM) crowns combine the durability of metal and the natural look of porcelain. Dentists can match these crowns to the shade of your own teeth. Despite their strength, PFM crowns have some drawbacks. For example, the porcelain coating may chip off over time, exposing the metal underneath. In addition, PFM crowns may gradually wear down the enamel on your opposing teeth (the teeth that touch your crown when you close your mouth).

3) Pressed ceramic crowns

A pressed ceramic crown has a hard inner core. It's similar to a PFM, but the core is ceramic instead of metal. To make this inner core, a technician melts and presses ceramic in an oven at a very high temperature. Next, they add multiple layers of porcelain. Like all-porcelain crowns, pressed ceramic crowns mimic the translucency of natural tooth enamel. Pressed ceramic crowns have the same drawbacks as PFM crowns. The layers of ceramic can chip away over time. Dentists use pressed ceramic crowns on front and back teeth.

4) Porcelain crowns

All-ceramic or porcelain crowns mimic the appearance of tooth enamel more than any other crown type. They're also a good choice if you have metal allergies. Lab technicians use many different materials to make ceramic crowns, but one of the most popular is zirconium dioxide. Zirconia crowns are extremely durable and can withstand heavier forces than other types of ceramic crowns. They're also gentle on your opposing teeth, resulting in less enamel wear.

5) All-resin crowns

Dental crowns made out of resin are generally less expensive than other types of crowns. But they're fragile and more likely to break compared to porcelain-fused-to-metal (PFM) crowns. Dentists often use resin to make temporary crowns. They last three to five years on average.

Root canals =When decay reaches the inner material of your tooth (pulp), you may need a root canal. This is a treatment to repair and save a badly damaged or infected tooth instead of removing it. The diseased tooth pulp is removed. Medication is sometimes put into the root canal to clear any infection. Then the pulp is replaced with a filling

Risks of a root canal

A root canal is performed in an effort to save your tooth. Sometimes, however, the damage is too deep or the enamel is too frail to withstand the procedure. These factors can lead to loss of the tooth. Another risk is developing an abscess at the root of the tooth if some of the infected material remains behind or if the antibiotics aren't effective. If you're apprehensive about a root canal, you can talk to your dentist about an extraction instead. This often involves placing a partial denture, bridge, or implant in place of the damaged tooth.

Tooth extraction=some teeth become so severely decayed that they can't be restored

and must be removed. Having a tooth pulled can leave a gap that allows your other teeth to shift. If possible, consider getting a bridge or a dental implant to replace the missing tooth. Tooth extraction offers a number of benefits. Most importantly, it reduces harmful bacteria that can damage your teeth and gums. Left untreated, a decayed or damaged tooth can wreak havoc on your smile, causing a domino effect of problems. Removing your affected tooth gives you the best chance for optimal oral health. Additionally, a tooth extraction can help ease dental pain almost immediately — especially if your tooth Post- There are some risks in root canal surgical infection. Drysocket. Nerve injury, Perforation of maxillary sinus, Delayed healing.

Instead of that we can follow the new technique (**Research gap**)

Antimicrobial and tooth cavity coating chewing gum using nanoparticles

We can make a chewing gum which can help to cure cavity without surgery. In this technique we can use a sugar free gum and in that we can add antimicrobial nanomaterial like fluorides such as Silver diamine fluoride with can extract by green tea leaves also we can use Zinc Oxide nanoparticles in that chewing gum and the most important topic if we are get successful in making a graphene containing material which will be harmless to body we can use this single layer material for coating of decayed teeth by a single layer

There are some properties why we can use silver diamine fluorides

Antibacterial: SDF has strong antibacterial properties that help to inhibit the growth of harmful bacteria in the mouth, which can contribute to the decay process.

Desensitizing: It can help reduce tooth sensitivity, which is common in teeth with cavities.

Non-invasive: SDF is a non-invasive treatment, meaning it doesn't require drilling

or removal of healthy tooth structure. This makes it particularly useful for treating children and individuals who are fearful of traditional dental procedures.

Stops Decay: SDF can effectively stop or slow the progression of dental cavities by strengthening the remaining tooth structure.

Long-lasting: It can provide long-lasting protection to the treated teeth.

Low cost: SDF is a relatively cost-effective treatment compared to traditional restorative procedures like fillings or crowns.

Minimal discomfort: Patients often experience minimal discomfort during SDF application.

Color change: It can cause a temporary darkening of the treated tooth, which is a cosmetic drawback for some individuals.

There are some properties why we use ZnO nanoparticles

Antibacterial properties: Zinc oxide nanoparticles exhibit antibacterial and antimicrobial properties. This can help in inhibiting the growth of harmful bacteria in the oral cavity, which is essential in preventing further decay around the cavity.

Enhanced remineralization: Zinc oxide nanoparticles can contribute to the remineralization of tooth structure. They can help restore minerals to the demineralized areas around the cavity, making the tooth stronger.

Biocompatibility: Zinc oxide nanoparticles are generally considered biocompatible and less likely to cause adverse reactions in the oral cavity.

Conclusion—This paper concludes that the surgical treatments like fluoride treatment, root canal, Crown Treatment these are painful and costly treatments instead of that we can give the best effective continue antimicrobial material deposition treatment using sugar free chewing gum can do. If we get success in using

graphene nanoparticles for coating of tooth cavity this will be the greatest achievement in tooth cavity treatment. Silver diamine fluoride nanoparticles can synthesis by green tea leaves then Zinc Oxide nanoparticles can use

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