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POST AND CORE IN DENTISTRY: REMBRACING THE PASSE

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ABSTRACT

A pulpless tooth can indefinitely serve as an integral part of the dental apparatus, provided the supporting structures are not compromised. Considerable amount of tooth structure loss occurs due to caries, endodontic treatment and the placement of previous restorations in an endodontically treated tooth. The loss of tooth structure makes the subsequent restorations more problematic and increases the likelihood of fracture during functional loading. So in order to make a tooth fit to receive a restoration, post and core is required. In the present era, post and cores are being expeditiously replaced by of dental implants. An upsurge in knowledge along with modernization of equipments has lead to an immense change of treatment modality from post and cores to dental implants. Decision making regarding the treatment should not be restricted to the recent trend but in such a manner that the patient receives the maximum benefit.[1] The field of restorative dentistry has made significant advancements over the years, leading to better outcomes for patients with damaged or missing teeth. One of the critical components of dental restoration is the post and core system. This article delves into what post and core are, why they are important, how they are placed, and their significance in ensuring a functional and aesthetically pleasing restoration.

What is Post and Core?

In dentistry, a post and core is a prosthetic system used to restore a tooth that has been extensively damaged or has undergone root canal therapy (RCT). The system serves two main purposes[2]:

1. **Post:** This is a metal or fiber-reinforced structure inserted into the root canal of a tooth to provide support for the final restoration, which is typically a crown.
2. **Core:** The core is the filling material that builds up the tooth's structure after a post is placed. It restores the tooth's form and function, providing the necessary support for the crown.

Together, the post and core system allows for the restoration of a tooth that might otherwise be too compromised to support a crown or other prosthetic restoration.

Why Post and Core[3,4]?

To understand the necessity of post and core, it's important to recognize the nature of the tooth after root canal treatment or significant decay. When a tooth undergoes root canal therapy, the pulp (the soft tissue inside the tooth) is removed, leaving a hollowed-out tooth structure. The tooth, having lost a significant amount of its internal structure, often lacks the strength to hold a crown securely.

In these cases, a Post and Core is placed to

- **Restore strength:** The post serves as an anchor, preventing fracture and providing adequate retention for the final crown.
- **Increase support:** The core material fills the void left by the removed pulp and rebuilds the tooth's original form, ensuring the tooth can support the restoration.
- **Provide retention:** Both the post and core help hold the crown in place securely, ensuring longevity.

Without a post and core, the tooth could be at risk of fracture or failure, especially under the pressure of normal chewing forces.

Types of posts[4,5]

Posts can be made from a variety of materials, each with its own advantages and disadvantages. The choice of post depends on factors such as the location of the tooth, the amount of remaining tooth structure, and the patient's specific needs. The common types of posts include:

1. **Metal posts**
   - **Stainless steel:** A commonly used material for posts. It's strong and durable but lacks aesthetics.
   - **Titanium:** A metal post that offers good strength and biocompatibility, making it a preferred choice in some cases. Titanium posts are less likely to corrode and have a lower risk of rejection by the body.

- **Gold:** Though rarely used today due to aesthetic concerns, gold was once a popular material for posts due to its strength and ease of manipulation.

2. **Fiber posts**
- Made from materials like carbon or fiberglass, fiber posts are more aesthetic compared to metal posts. They are commonly used in the anterior (front) teeth, where visibility is a concern.
- Fiber posts are also more flexible, reducing the risk of tooth fracture compared to metal posts, which are stiffer.

3. **Ceramic posts**
- Ceramic posts are known for their aesthetic appeal, especially in visible areas of the mouth. They are biocompatible and blend well with natural tooth color, making them an excellent choice for patients seeking a more natural-looking restoration.
- However, ceramic posts are typically less flexible than fiber posts, which could increase the risk of fracture under excessive stress.

Core materials[5,6]

Once the post is placed, the next step is to build up the core. Various materials can be used for this, including:

1. **Resilon:** A thermoplastic root canal filling material that is sometimes used in post and core systems. Resilon has the advantage of being biocompatible and bondable to the post.
2. **Composite resins:** These are the most common core materials used today. They can bond to both the tooth structure and the post, creating a strong, durable, and aesthetic result. They are also more flexible than other core materials, which helps to reduce the risk of tooth fracture.
3. **Amalgam:** While less commonly used today due to aesthetic concerns, amalgam was once a go-to material for dental cores. It is durable and provides a strong bond to the post.
4. **Glass ionomer cement:** This material is occasionally used as a core in situations where bonding strength isn't as critical. It releases fluoride, which can help prevent further decay.

The Process of Post and Core Placement[6]

The process of placing a post and core involves several stages, each requiring careful planning and precision.

1. **Root canal therapy:** Before a post can be placed, the tooth must undergo a root canal treatment if it hasn't already. This process involves removing the infected or damaged pulp and cleaning and sealing the root canals.
2. **Post preparation:** Once the root canal is complete, the dentist will determine the need for a post. The canal is then reshaped and prepared to receive the post. In some cases, additional space is needed to ensure that the post will fit securely.
3. **Post insertion:** The post is then placed inside the prepared canal. The post may be cemented in place using dental adhesive or bonding agents, depending on the type of post used.
4. **Core Build-Up:** After the post is securely in place, a core material is used to rebuild the tooth structure. This core helps to form the base for the final crown.
5. **Crown placement:** After the core material has set, the tooth is ready to receive a permanent crown. The crown is fabricated to fit precisely over the core and post, restoring the tooth's function and appearance.

Advantages of Post and Core[7,8]

There are several reasons why post and core systems are commonly used in modern dentistry:

- **Strength:** Post and core systems provide additional strength to teeth that have undergone root canal therapy or significant decay, reducing the risk of fracture.
- **Functionality:** With proper restoration, the tooth can continue to serve its function, enabling the patient to chew and speak without discomfort.
- **Aesthetics:** Modern materials allow for highly aesthetic restorations, especially when fiber or ceramic posts are used.
- **Durability:** When placed correctly, post and core restorations can last for many years, providing long-term value.

Potential Risks and Considerations[9]

While post and core systems offer many benefits, they are not without potential risks. These include:

- **Fracture of the tooth:** If the post is too rigid or not properly placed, the tooth can fracture under pressure.
- **Post loosening:** Over time, the post may become loose, compromising the integrity of the restoration.
- **Root canal failure:** If the root canal treatment is not successful, the post and core may need to be removed, and the tooth may need to be extracted.

CONCLUSION

Post and core systems are a vital part of restorative dentistry, enabling the restoration of damaged teeth that would otherwise be non-functional. With a variety of materials available for both posts and cores, dentists can customize treatments to suit the specific needs of the patient. Whether for functional restoration or aesthetic purposes, post and core systems continue to play an essential role in preserving natural teeth and ensuring long-lasting dental health.

By offering both strength and aesthetic appeal, post and core systems ensure that patients can maintain their dental health without sacrificing the look of their smile. As materials and techniques continue to evolve, the future of post and core systems looks brighter, with even more durable and aesthetic options on the horizon.

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