

# Application of computer-aided technology in fiber posts removal



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## Introduction

In recent years, fiber posts have gradually replaced metal posts and been widely used in clinics. Its proper elastic modulus, outstanding aesthetic performance and good bonding characteristic ensure the firm bond with dentin, but also increase the difficulty of removal.

At present, there are mainly two types of fiber posts removal systems: ultrasonic removal and mechanical drill removal.

With the gradual development of "Guided Endodontics", dynamic navigation system and digital guide technology have also been used to remove fiber posts.

## Traditional Removal Method

### ◆ mechanical drill removal

In clinical practice, Some manufacturers have produced proprietary removal kits, but the kits are only suitable for specific fiber posts and cannot effectively remove the posts and luting material, the kits can also cause the formation of microcracks.

For mechanical drill removal, not only result in dentin loss, long clinical time consumption and root canal penetration, but the experience of the operator significantly affects the effectiveness of removal.

### ◆ ultrasonic removal

Ultrasound can remove the fiber posts more effectively than the removal kit, and the failure rate of the penetration is lower than that of the mechanical drill, but higher than that of the removal kit.

However, the fracture resistance value of the tooth after ultrasonic removal is significantly lower than that of the removal kits, and removal time, dentin loss are significantly greater than the removal kits. The operator's experience also significantly affects the effectiveness.

## Computer Aided Removal Technology

### ◆ digital guide technology assisted removal

The clinical process of digital guide in fiber posts removal is shown in the figure1. The guide ring accurately keeps the drill on the axis of the fiber posts to prevent the dental loss, reduce the risk of penetration, and enable the operator to accurately and minimally

minimally remove the fiber posts within the predictable range, so as to obtain a better prognostic effect.

### ◆ dynamic navigation system assisted removal

The clinical process of dynamic navigation system (DNS) in fiber posts removal is shown in the figure1. DNS can achieve precise, efficient, and minimally invasive removal of fiber posts.

Compared with digital guide technology, DNS has significant advantages:

- ◆ real-time visualization, allowing intra-operative change of the drill path;
- ◆ convenient flushing;
- ◆ applied in areas with small occlusal gaps;
- ◆ shortening the treatment cycle, data collection, plan design, and guided removal can be completed on the same day.

## Conclusion

Fiber posts removal is a difficulty in clinical operations, digital guide technology and dynamic navigation system can meet the clinically accurate, efficient, and minimally invasive treatment concept.

However, there are still a few studies on this aspect, and more clinical studies are needed to improve its accuracy which is the primary consideration and problem to be solved for its widely applied in clinical practice.

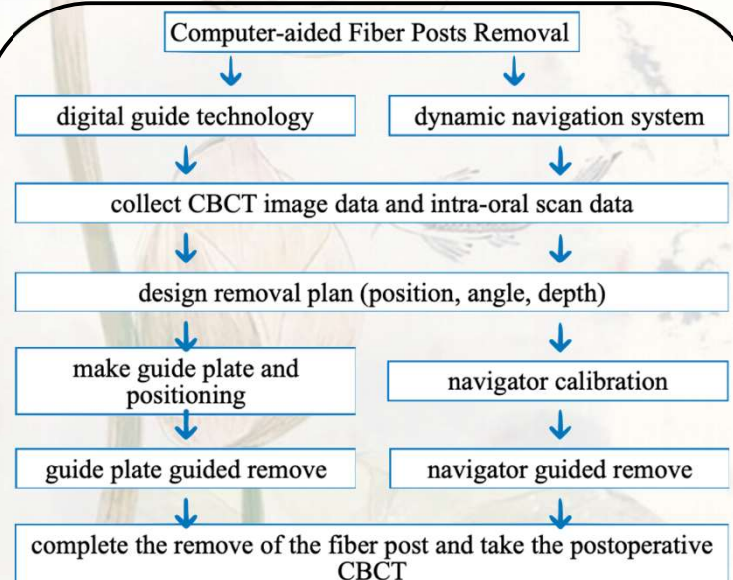


Fig1 clinical process of the two computer-aided technologies in fiber post removal