Predator® Zirconia Diamonds

Article and photo courtesy of Kaori Maehata D.D.S. (Nakae Dental Clinic - Kanagawa, Japan)
Fabrication of all-ceramic crown performed by Mr. Yuji Takahashi, (Kyoyukai Kanagawa Branch office porcelain Div. Kanagawa, Japan)

Predator® Zirconia Diamonds vs. Prostheses

In recent years, there has been an increasing trend to select all-ceramic materials for restorations due to the increasing demand for aesthetic treatment, advancement in all–ceramic coping materials, functional advancements in CAD/CAM, as well as soaring prices of gold and other dental precious metals. Additionally, all-zirconia based prostheses have also become available.

These prostheses are considered superior due to increased durability and resistance to fracture. However, it is an important consideration that in some circumstances these may need to be removed.

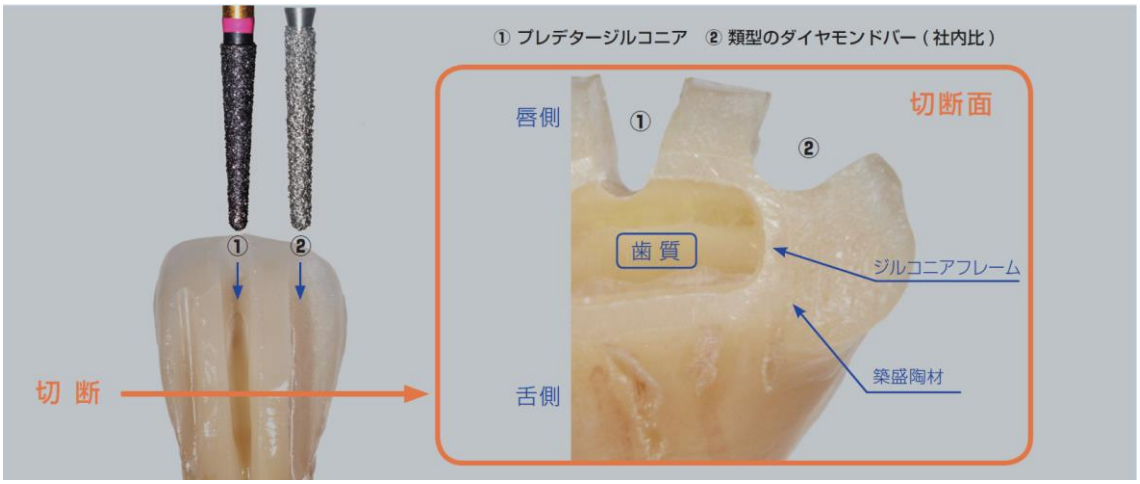
The Predator® Zirconia Diamonds can be used for cutting, removing or adjustment of, not only all-ceramic material, but also a wide range of other prosthetic materials with exceptional cutting efficiency.

Cutting ability of different types of burs for all-ceramic prostheses

Because all-ceramic prostheses use strong ceramic material such as alumina and zirconia for the coping, it is extremely difficult to cut through and remove the crown by using regular diamond and carbide burs. Using inefficient cutting burs for the removal of these hard materials, causes the generation of unnecessary heat which has the potential to damage the underlying teeth and periodontal structures. Also, the decrease in work efficiency prolongs the treatment time and adversely affects the performance of the bur.

After performing an abutment preparation on an extracted tooth, an all-ceramic

crown (zirconia frame) was fabricated and bonded using adhesive resin cement.
2 types of burs were used –
(1) Predator® Zirconia Diamonds (fine)
(2) Diamond bur similar to Predator® Zirconia Diamonds.
Preparation was made using the 1:5 increasing contra angle handpiece (at 200,000rpm with micromotor). The cutting surface on buccal and buccolingual cross-section was observed for comparison.
Results –
(1) Predator® Zirconia Diamonds:
- Cutting continued through the zirconia coping.
(2) Diamond bur similar to Predator® Zirconia Diamonds
- Cutting stopped at the interface between porcelain and zirconia coping layers.
Looking at these results, we can see that Predator® Zirconia Diamonds provided a sharper edge with a more efficient performance.

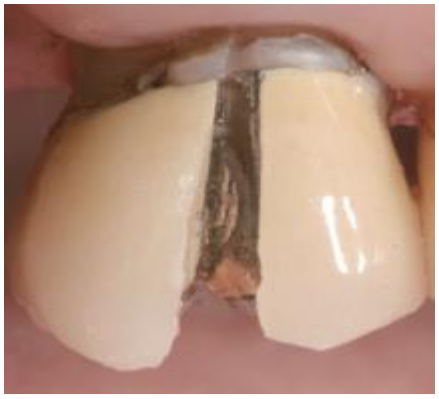


切断：cross section　　**切断面**：cutting surface
唇側：labial side　　**舌側**：lingual side
歯質：tooth substance　　**築盛陶材**：porcelain
ジルコニアフレーム：zirconia frame
プレデタージルコニア：Predator® Zirconia Diamonds (fine)
類型のダイヤモンドバー：Diamond bur similar to Predator® Zirconia Diamonds.

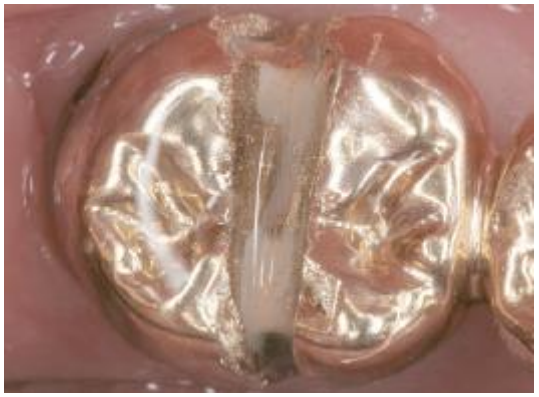
In all cases, especially the urgent treatment of a symptomatic tooth, which requires the immediate removal of prostheses, or occlusal correction, having a bur that can cut all types of prostheses is indispensable. With continuing advancement of CAD/CAM, there will be an increase in the use of prostheses with hard to remove materials. Therefore an increase in the use of Predator® Zirconia Diamonds should be expected in the future.

1. Cutting of all-ceramic crown. It took a minute and half to two minutes to cut the entire circumference of the labiolingual plane of the abutment tooth.

1(a). Cross-section of all-ceramic crown. There is no sign of chipping, and the surface of the edge remains sharp.



2. Cutting of Porcelain fused metal. The cutting edge stays sharp.



3. Cutting through metal crown. Cutting through this metal crown is simple.

4. Adjusting the clasp inside of the denture using a micromotor (below 30,000rpm).