

We all want – perfect occlusal clearances

With focus and a little help from technology, we can get ideal occlusal clearances every time.

By Peter Watt

It's incredible how far we have come with full-ceramic materials – highly aesthetic and amazingly robust restorations that can withstand grinding, chewing and biting forces 24/7 for many years. The paradox is that while strong and durable, these restorations can also be fragile, at least if certain rules are not followed. And perhaps the most important rule – the one associated with the many failures – is occlusal clearance.

When we are talking about fractions of a millimetre, there can be little leeway in a manufacturer's guidelines, so it is important that we all know (or check) what the clearances are required for the material of choice before completing the reduction.

It's not easy for a lab to contact a dentist and say they are unable to create a viable restoration with the impression provided, says Brendan Morrison, Business Development Manager for Melbourne laboratory Andent, but it happens regularly.

"To get the patient back in to prepare the tooth again – that's time, cost and inconvenience to the dentist and the patient, and more patient discomfort. It can be embarrassing but sometimes

you've got to swallow your pride and bring the patient back to gain the optimal result for longevity of the restoration. However we will help the dentist avoid having to do that, if possible."

When a lab calls a dentist with a clearance problem, the dentist invariably wants to know if the lab can fix it without having to call the patient back in. That usually means two options: a reduction coping and/or adjusting the opposing tooth.

"The problem is, it's not overly accurate and problems can arise: the reduction coping may not be seated properly or there's a bit of temporary cement left over; they might not be able to get it in there so they just do it by hand. And when we adjust the opposing tooth, we're doing it on a stone model, so there are always some differences to what's seen in the mouth. If it's minimal, even if they over-trim, the crown will seat to the margins but internally it won't be as good a fit."

Most of Andent's restorations these days are e.max, monolithic zirconia or porcelain fused to zirconia (PFZ). Zirconia has more than enough strength for the posterior but lacks the aesthetics for the anterior, while e.max excels aesthetically. However, e.max is unsuitable for bridges, hence Andent manufactures many PFZs, laminating porcelain to zirconia on the labial/buccal of the crown to give the required aesthetics while also providing strength to withstand biting and grinding forces on the lingual surfaces being in 100% zirconia.

There can be a number of reasons for the selection of a material and all suppliers provide certain preparation guidelines. Occlusal clearance plays a pivotal role in material selection, with every supplier recommending a minimum thickness for their specific materials. How Andent approaches a clearance issue depends on the material that is in play, with the aim of achieving strength and functionality that will assist in the restoration's longevity.

"Our restorations are backed with a



Pivotal: Adjustment under irrigation

guarantee and are subject to strict quality control. In the manufacturing process or the clinical application and seating of a crown, it is imperative that adjusting or grinding be controlled and comply with the material's capabilities.

"It's also critical to remember that if zirconia is not polished correctly it can be quite abrasive. All ceramic materials should always be adjusted under irrigation with fine diamond. If not it can generate heat, creating a real risk of micro-fractures, so it must be adjusted carefully with diamonds and/or minimally with heatless stones.

"We have even built up our own kit of heatless stones and diamond polishing rubbers that we can supply to dentists. These are designed in special shapes with different sized grits that we have developed for faster, smoother, controlled adjustment/polishing of all ceramic materials."



Andent's: All ceramic polishing kit

Of course there is one innovation that has changed the game when it comes to occlusal clearances – the intraoral scanner. When you have relatively affordable technology that is incredibly accurate, allowing you to gauge, adjust and rescan in minutes, preparation issues can be uncovered before the case ever leaves the practice. It's easy to foresee scanners being a standard part of every dentist's equipment in the future. ♦



Laboratory: Reduction made on die (model)



Chairside: Coping placed on prepared tooth for reduction