

The Monoblock Technique – a revolution in adhesive dentistry?

A composite cement with an integrated bonding system that can also be used as a core build up material has been a long-awaited dream in restorative dentistry.

According to standard practice today, 3 to 4 different materials, which are often from different manufacturers, are required for bonding to dentin and enamel, fabricating composite core build ups, and adhesive cementation. Since modern composite materials in dentistry are still based on methacrylate, combining materials – for example, a bond from one manufacturer with the composite of another – is often not a problem. Nevertheless, it would be desirable to have one integrated system available.

Coltène/Whaledent has recently developed a dual-curing composite material that can be used as a cement as well as a core build up material (ParaPost Para-Core Automix 5 ml). A chemical curing dentin bonding agent, which is compatible with the material, is also available (ParaBond consists of a Non-Rinse Conditioner and Adhesive A & B, which requires mixing before application; and is why it is defined as a two-step bonding system).

ParaBond and ParaCore can be used for:

1. adhesive cementation of a root canal post,
2. fabrication of a core build up, and
3. adhesive cementation of a permanent restoration.

Coltène/Whaledent describes this time-saving application as the “Monoblock Technique.” The ParaBond/ParaCore System demonstrated excellent sealing against marginal microleakage, which indicates good to very good clinical viability²⁰.

The Monoblock Technique is particularly suitable when light-transmitting, metal-free root canal posts are used with endodontically-treated teeth that will be fitted with a crown. Root canal posts provide greater retention of the core build-up, and distribute masticatory forces along the interface of the residual tooth structure 3, 10, 17. The use of metal-free root canal posts prevent the greyish translucency at the gingival margin caused by the light reflection from metal root canal posts.

Publications regarding the use of root canal posts recommend that any further weakening of the residual tooth structure caused by the use of a post should be avoided as much as possible. Root canal posts are primarily indicated whenever there is over 50% loss of tooth structure. The smallest diameter of root canal post should always be used to ensure

that there is no overloading of the abutment tooth by the final restoration 4, 5, 13, 19. From an aesthetic point of view, preference should be given towards the use of a glass fibre reinforced or ceramic root canal post; in which a direct core build up is generally fabricated during the same appointment. Ceramic root canal posts can however also be combined with a ceramic core using the indirect technique.

There are conflicting opinions regarding the necessary properties for root canal posts and core build-up materials. Some authors stipulate that root canal posts and dentin should have a similar modulus of elasticity 1, 2, 9, 14, whereas others claim that the rigidity of root canal posts will increase the service life expectancy of the post 1, 15. Neither theory is supported by adequate clinical studies. In regards to direct core build-up materials, amalgam is far superior in terms of its strength and dimensional stability, although it has

definite disadvantages, such as discolouration of the tooth structure due to corrosion, which rules out its use in the anterior region. Composites have a high flexural strength, while glass ceramics appear to be very suitable for fabricating a core build-up in the anterior region 20.

Glass fiber reinforced root canal posts

According to a recently released meta-analysis 6, prefabricated glass fiber reinforced

and ceramic root canal posts failed more quickly than custom casted, metallic root canal posts. However, the