Restorative Dentistry Under Microscopic Vision
– A Brief View!

Claudia Cia Worschech, DDS, MS, PhD
private practice in São Paulo/Brazil since 1992

When the profession of dentistry was established, operative dentistry was considered an entirely mechanical practice with almost no relation to the techniques or physical and biological properties of dental materials (1) and few equipment were necessary. As the science of dentistry progressed, new materials were developed and so more complex restorative technique became available (1).

Until recently, magnification as used by the dental clinician has been in the form of eyeglass-mounted oculars with or without illumination accessories (2).

Nowadays, restorative dentists and periodontists are using step of magnification at the bottom end 2,5X (3). When dentist used microscope, a properly configured should be choose with magnification range of 2,5X to 15X (4).

Dental professionals have recognized that the quality of the light in the working field is just as important as magnification is (5), and this fact increases the advantages of surgical microscope utilization.

One critical factor associated with aesthetics, periodontal health, and longevity of restorations is the precision of the margins at the periodontal-restorative interface. Improper margins can cause overhangs, and over contouring that may ultimately result in caries, periodontal inflammation and breakdown, and compromised aesthetics. In order to prevent pathology at the restorative tooth interface, each phase of the aesthetic treatment must be performed with precision and care (6).

Then, colour, value, shade, translucency as so important as precision of margins is, and cavity preparation, polishing and cementation without excess (6).

Micropatology either invisible or not compelling at less than 12X. This includes signs of occlusal disease (tell-tale facets and enamel loss); micro leakage; early recurrent decay; and isolated periodontal inflammation surrounding crude dentistry that violates parameters of marginal integrity (7).

Fig 1: excess of cementation can see viewed perfectly (6X magnification - Nikon equipment and Carr adapter)

Fig 2: innapropriate adaptation of crown (10X magnification - Nikon equipment and Carr adapter)
Every time when we replacement restorations (esthetic or non esthetic restorations), due to recurrent carie lesion, or related to superficial or intrinsic discolorations of resin which damage the esthetic restoration’s quality is a frequent the remotion of part of dental health. Recognize the limits between teeth and restorations, seeing these structures with magnification and high quality light, provides less wear, less health dental tissue remotion and more preservation of teeth.(8)

Forgie et al investigated differences in cavity sizes using normal vision and surgical magnification (2,6X) and concluded that experienced clinicians performed larger preparations with unaided vision compared to those performed with magnification(9).

The substitution of amalgam or esthetic restoration often leads to ever larger restorations that have shorter life spans than their predecessors, and the replacement procedures themselves may cause damage to adjacent healthy teeth (10).

If the margin “disappears” when magnified, then it will certainly not be visible to the naked eye. The fine internal and external colorations and characterizations are virtually impossible to achieve without appropriate magnification.

Fig 3: using a scanning electron microscope is easily identify how polishing can modify the restoration behavior. In a clinical procedure, margins must be smooth. Is possible identify perfectly the limits between tooth and restorative material

Fig 4: clinical ilustration showing the limit between tooth and resin in a posterior tooth (4X magnification Nikon equipment and Carr adapter).

Colored indicators could be used for provide distinction between tooth or resin components, for example. The dental health tissue remotion should decrease so much after clinicians recognized the importance of see more; see in a bit more details the limits
between teeth and adhesive restoration, maybe through color indicator utilization or using one scope (8).

The benefits achieved by microscope operatory are viewed in all specialties of dentistry.

According Baumman (11), under the microscope light oral cavity anatomy became so vivid that is very difficult describes it, and higher magnification is very important to examination of each detail.

There are some positions for execute work. Many clinicians prefer 12 o’clock or 9 o’clock positions. In this way all team get working better because get easily pick up all instruments, materials and provide more ergonomic movements. And to observe through binocular is more common and very important form for achieve perfect ergonomic and precision in details (traditional way).
Or dentist and auxiliary team can observe all steps of the treatment looking through a LCD monitor (in my office sometime we work looking through LCD) which became possible visualize in detail and simultaneously step by step of procedures (alternative way) as similar as what was suggested by Assad Mora who using high technology for get a 3D images, and is also possible to see very clear all details of the procedure.

There is a learning curve which could be longer or short, depends on the each person and how much time this person invested in learning. Many professionals start work without sufficient knowledge and, sometimes, feel sad or fell incapacitated for work.

Training must be done.

References:


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