**Micro-Dentistry**

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Resolution

Resolution plays a most important role. Our naked eye cannot identify, for example, 72 dpi (dots per inch). By looking through a microscope, you can identify more than 350 dpi. Unfortunately, dental loupes are not able to give us such a high-resolution view. The working field used in micro-dentistry is not two-dimensional, it is three-dimensional. If used correctly, this would give users more high-quality machines and make the price more attractive for others to adopt the use of microscopes.

Magnification

Magnification in micro-dentistry is achieved through high quality lenses and special magnifying devices. Digital zooming would not increase the amount of information acquired first through its digital processing. Microscopes are the standard magnifier in the area of micro-dentistry. At first, we used microscopes popular in the medical fields of ophthalmology and plastic surgery. However, procedures in dentistry have many differences compared to surgery done in the medical field.

Microscope manufacturers spent a lot of time and effort perfecting dental microscopes. Just as desktop computers still have many aspects that require us to choose a particular software or hardware, dental microscopes also have several points that require dentists to do the same. Recent innovative new technology makes it possible that several visual enhancing systems are coming upon the stage as second-generation magnifiers in the field of micro-dentistry. This year, a third-generation system might come into the field. I look forward to a time when such systems become as good as this.

Illumination

Illumination can give us a brighter and clearer field view. The more light moves to blue, the higher the resolution is for the human eye. That is the reason why recently a lot of dental microscopes have begun to use a xenon or metal-halide light guidance system. Halogen light, which is darker than a xenon or metal-halide, is still used in micro-dentistry because it is soft to the human eye and its yellowish color allows increased concentration for the patient. There is also a LED (light emitting diode), yet a microscope would not use this light because it spreads, but there are certain cases where using visual enhancing systems because it is bright enough and lasts longer.

Ergonomics

Many dentists have started to retire because of serious backaches. The backache comes from bad posture during dental procedures. Right-handed dentists usually lean their bodies to the right side to see the object directly via their eyes rather than through the reflection of a mirror. Micro-dentistry not only provides dentists excellent ergonomics, but also provides patients excellent ergonomics during the procedure as well. When patients can receive treatment in a comfortable position, their satisfaction for the dental treatment will increase.

Visual guidance

Without visual guidance, dental treatment would be as a regular dental procedure under high magnification, high resolution and brighter illumination. Regular treatment is usually performed with one’s tactile guidance (the sense of touch). It gives us more precise movement and results in better fitting, suturing, cutting, prepping, shaping, filling, etc. Once one masters working with enhanced visual guidance, one can achieve better results without any magnification or visual enhancing devices. However, to achieve the ability to work under the visual sense takes a lot of time in training and self-criticism.

The learning curve of this will be like the following:

1. Learning and getting information through lectures or books.
2. Trying with whatever magnifier one has and self-evaluating.
3. Learning more.
4. Purchasing a better magnifier or visual enhancing devices suitable for one’s needs.
5. Working with the new magnifier or visual enhancing devices and self-evaluating.
6. Showing the case to others and getting their insightful evaluation/feedback.

Continuous training, self-evaluating, and getting feedback from others will give you a better result and there is no end to what you can learn by employing such an approach. However, if you decide you’ve learned enough, you not only do yourself but your patients a disservice.

Micro-instruments

Micro-instruments were first developed in the area of micro-endodontics. Nowadays, many kinds of micro-instruments are available in many fields in micro-dentistry. Even the smallest instruments are too big for micro-dentistry (Fig. 4).

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**try this:** Close your eyes and have a friend put an object in your hand that you have to determine what it is by using your sense of touch. It will likely take you a few minutes to correctly identify the object. However, if you open your eyes and watch the object being placed in your hand, you will immediately send the information about the shape of the object to your brain much more quickly and exactly. This simply illustrates the difference between the amount of information and the speed with which it travels to the brain when using tactile guidance vs. visual guidance.

Developed in micro-dentistry, working under visual guidance is the key. It gives us more precise movement and results in better fitting, suturing, cutting, prepping, shaping, filling, etc. Once one masters working with enhanced visual guidance, one can achieve better results without any magnification or visual enhancing devices. However, to achieve the ability to work under the visual sense takes a lot of time in training and self-criticism.

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**Conclusion**

Some might need more information or scientific articles to begin micro-dentistry on their own. One place to start is to attend an annual or bi-annual meeting of micro-dentistry, which are held all over the world. That might be the best place to begin in order to get more information. The Academy of Microscope Enhanced Dentistry plans to launch an official journal of micro-dentistry, so that would help educate anyone interested in the field.