**Micro-Dentistry**

From Page 1

ry, micro-prosthodontics (Fig. 1), micro-preventive dentistry, mini-
mal-intervention dentistry, micro-orthodontics, micro-implantology,
etc., and the more well known micro-endodontics and periodontal
microsurgery (Figs. 2, 5). Yet this is totally different from the group
that uses micro-abrasion systems. Key-
words in the area of micro-dentistry
are magnification, resolution, illu-
nimation, ergonomics, visual guid-
ance and micro-instruments.

**Magnification**

Magnification in micro-dentistry is
achieved through high quality
leaves at the dentistry. Digital
zoning would not increase the
amount of information acquired first
through its digital processing. Micro-
scopes are the most used magnifi-
cifer in the area of micro-dentistry. At
first, we used microscopes popular
in the medical fields of ophthalmol-
ogy 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 perfor-
ing dental microscopes. Just as
desktop computers still have many
aspects that require users to choose a par-
ticular software or hardware, den-
tal 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 sec-
ond-generation magnifiers in the field of micro-dentistry. This year,
a third-generation system might come
into the field. I look forward to
seeing how it is used as this will
give us more high-quality machines and make the price more
attractive for others to adopt the use
of microscopes.

**Resolution**

Resolution plays a most impor-
tant role. Our naked eye cannot
identify, for example, 72 dpi (dots
per inch). By looking through a
microscope, you can identify more
than 550 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-dimen-
sional. If used correctly magnifiers as this
would give users more high-quality machines and make the price more
attractive for others to adopt the use
of microscopes.

**Illumination**

Illumination can give us a bright-
er 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
dental microscopes have begun to
use a xenon or metal-halide light
source, which is especially impor-
tant for those dentists who want to
take a nice photo in micro-endodon-
tics. Halogen light, which is darker
than xenon or metal-halide, is still
used in micro-dentistry because it
is soft to the human eye and its yel-
lowish color allows increased con-
centration for dentists. There is also
a LED (light emitting diode), yet a
microscope would not use this light
because it spreads, but there are
cases when a specific concentration
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.
Light-handed dentists usually leave
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 ergo-
nomics, but also provides patients
excellent ergonomics during the
procedure as well. When patients
can receive treatment in a comfort-
able position, their satisfaction for
the dental treatment will increase.

**Visual guidance**

Without visual guidance, dental
treatment would be as regular den-
tal procedure for its magnifica-
tion, high resolution and brighter
illumination. Regular treatment is
usually performed with one’s tactile
guidance (the sense of touch) and
at a faster rate of information to
the human brain compared to that
of the sense of touch.

Try this: close your eyes and have
a friend put an object in your hand
that you have to determine what it is
only by using your sense of touch. It
will likely take you a few minutes to
correctly identify the object. How-
ever, 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 for micro-dentistry, working
under visual guidance is the key.
It gives us more precise movement
and results in better fitting, satur-
ing, cutting, prepping, shaping, fill-
ing, etc. Once one masters working
with enhanced visual guidance, one
can achieve better results without
any magnification or visual enhanc-
ing 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 informa-
tion through lectures or books.
2. Trying with whatever magnifi-
er one has and self-evaluating.
3. Learning more.
4. Purchasing a better magnifier
or visual enhancing devices
suited for one’s needs.
5. Working with the new magnifi-
er or visual enhancing devices
and self-evaluating.
6. Showing the case to others and
getting their insightful evalua-
tion/feedback.

Continuous training, self-evalu-
ating, 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 dis-
service.

**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 though instruments are too
big for micro-dentistry (Fig. 4).

**Conclusion**

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

**Contact info**

Tetsuya Hirata, DDS, PhD
AMED 2009 President
Amenity Hills 4F 1-1-3 Uehonmachi
Tennoji-ku, Osaka 545-0001
Japan
Tel.: +81 6 6765-8128
E-mail: drhirata@microscopentedistry.com

**Tell us what you think!**

Do you have general comments or
criticism you would like to share? Is
there a particular topic you would like
to see more articles about? Let us
know by e-mailing us at feedback,
dtamerica.com. If you would like to
make any change to your subscription
(name, address or to opt out) please
send us an e-mail at database,
dtamerica.com and be sure to include
which publication you are referring to.
Also, please note that subscription
changes can take up to 6 weeks to
process.