Many uses of an operating microscope

By Dr Rick Spencer

"For me, ergonomics is the most important benefit. Before purchasing a microscope, I had a back problem. Now my back never gives me trouble at work and my wife's (also a Dentist) neck is also better..."

Since writing my first article 6 years ago, the operating microscope (OM) has evolved from being a fringe instrument to a well known treatment modality. Microscope sales are now in the hundreds per year and some teaching hospitals have the OM available for student use. The Australian Society of Endodontology (NSW Branch) kindly donated an OM to the University of Sydney for this purpose. Last year, I was able to show some students subgingival calculus with the microscope and it was a great teaching experience - one student was telling me the root surface was merely rough and he was amazed to see the calculus looking like the Rocky Mountains on the root surface.

Dr David Clark (Figure 1), a general dentist from Tacoma, Washington has as far as I know done more than anyone in promoting the operating microscope. The Academy of Microscope Enhanced Dentistry which he founded is alive and well and he gave the opening address at a large European Congress called "To see or not to see" which featured 15 speakers over 3 days. He tells me this is where the OM is most popular.

I am pleased to report that microscope manufacturers have recognised Dentists' needs and many new and more ergonomic microscopes have entered the market. Global released a new G6 and Zeiss released the Assad Mora interface (Figure 2) which greatly improved their Pico as well releasing the Pro-Ergo. Many other brands have come onto the market and the future looks interesting.

Figure 1. Dr David Clark and the author in the US.

Ergonomics

For me, ergonomics is the most important benefit of the OM. Before purchasing a microscope, I had a back problem. Now my back never gives me trouble at work and my wife's (also a Dentist) neck is also better. If used properly, the microscope facilitates perfect posture (Figures 3-4). Your nurse's posture is also important and please note the live screen positioned directly behind the dentist (Figure 5).

Researchers studying human biometrics have

Figure 2. Dr Craig Whitehouse from New Zealand using a Zeiss Pico with Assad Mora interface.

Figures 3 (above) and 4 (below). Microscopes can facilitate perfect posture. Images courtesy of Dr Jose Moura Jr, Brazil.

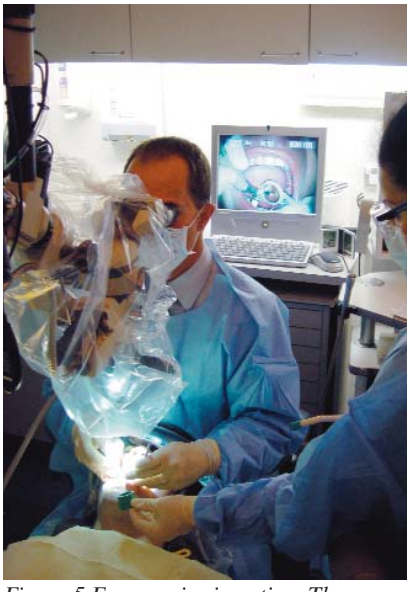

Figure 5.Ergonomics in action. The author using the Global G6 as nurse Mrs Barbara Faulkner sees what I see.

measured the load on the neck and shoulder muscles and found it doubles for every 2-3 cm the head shifts forward from the ideal upright posture - no wonder our necks get sore! Figure 6 comes courtesy of Posture Pole (www.posturepole.info) who manufacture a device I lay on in the evenings for 5 minutes to keep me straight - the Doctor who produces it tells me the 3x in the diagram should be 4x!

Learning curve

After attending a course and getting over the initial learning obstacles (about 6 months in my experience), you will find using your OM fun and very easy. By fun I mean that you see things or situations in the mouth you've never seen before - in fact, my teacher warned me not to go sightseeing because it would waste time. The mesial of an upper 7 is normally tricky in a small mouth due to lack of vision and light as well as bleeding. No problem (Figure 7) with an OM and the bleeding is less due to better tissue handling facilitated by great visibility. You will discover that some areas of chronic bleeding which we've always blamed on poor oral hygiene actually have small amounts of subgingival calculus at the CEJ (Figure 8).

For right handed dentists, often the most difficult quadrant is the upper right. With an OM however, this is reversed and the difficulty is now the lower left. Sometimes I meet an operator who, after some years, still cannot work comfortably in

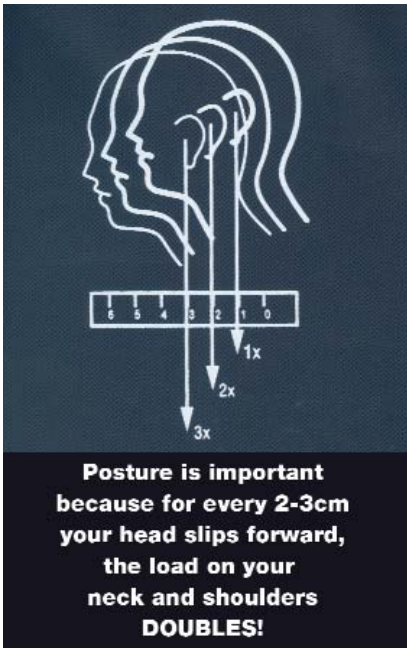

Figure 6. The load on the neck and shoulder muscles doubles for every 2-3 cm the head shifts forward. Image courtesy of Posturepole.

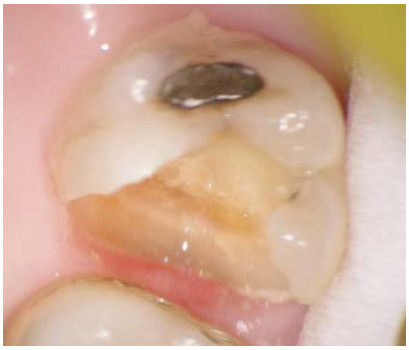

Figure 7. Great light and visibility allow for better tissue handling - see the gingival margin.

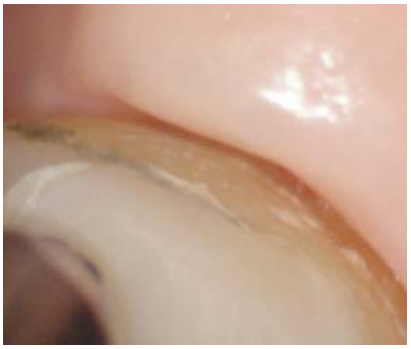

Figure 8. Reidual calculus clearly visible at the very back of the mouth.

Figure 9. Double ended mirror.

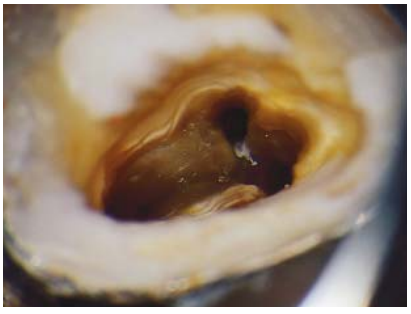

Figure 10. Courtesy of Dr Steve Cohn - Endodontist/Microscope Teacher.

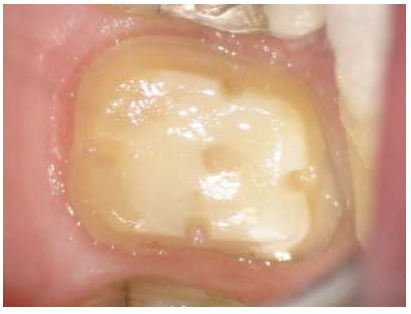

Figure 11. Accurate tissue handling.

that quadrant. A 10mm mirror held from above the tooth is a good solution and Hartzell (Crown Dental) produce an excellent double ended mirror (Figure 9) which has become an essential tool for me. The difficulty occurs because the mirror needs to be used for mesials and distals and a large mirror collides with the handpiece and you become bunched up and cannot see. Good scheduling is important in the learning phase; to be frank, while learning I once did 3 lower left quadrants in a row and I was exhausted.

The many uses of an OM

1. **Endodontics** - well established superiority - see Figure 10 - courtesy of Dr Steve Cohn, a retired endodontist and microscope teacher.
2. **Crown and Bridge** - you can not only feel the margin but actually see it! Good tissue management becomes easier - see Figure 11.
3. **Partial dentures** - fitting dentures properly is always a challenge and the OM can help in seeing areas holding the denture from fitting.
4. **Routine restorations** - Composite these days is hard to see -colour matches have improved and especially for composite removal the OM allows easy and conservative removal of old restorations. Dr Rolando Nunez from South America gave a course in Sydney where he showed the OM used for immaculate finishing (better aesthetics and less post-op staining) of his aesthetic work.
5. **Surgical extractions** - Great for sectioning and removal of roots. The dental nurse will be amazed as she has never been able to see so well allowing her to perform better in assisting in these stressful situations and more easily understand how difficult the procedure is. More respect is gained by the Dentist since she can appreciate the difficulty and is much more understanding if she sees the Dentist becoming stressed.
6. **Periodontics** - While in the US last year, I talked with two periodontists who teach the OM and apart from surgery, they use the OM to microscopically scale areas which have not responded to routine scaling and root planning. Very small blades (Figure 12) can be used for surgery - they are unique as they cut forwards as well as backwards and can easily be bent for good access (Hartzell). At a course in Sydney (July 2007), Italian peridontist, Dr Cortellini, outlined his MIST (minimal intervention surgical technique) results using an OM - he showed that very accurate suturing gave better results than conventional methods especially for regenerative procedures.
7. **Paedodontics** - When I started, some said the microscope would scare the children. After 6 years, I have not experienced this once; in fact, I can work more easily and gently in their small and delicate mouths.
8. **Medico legal** - Once I had a patient accuse me of filing the wrong tooth! I was able to show him decay in the tooth I had restored.

Photograpy also becomes quick and easy - I am up to 36,000 photos now which are automatically filed away under time and date by fotostation, an industrial programme specifically designed for large numbers of images. Images can be found very quickly just by looking up the date and no time is wasted filing away images - simply load the card in the computer every few days or weeks depending on how large your card is and you're done.

Rubber dam usage

Rubber Dam does make working with the OM easier and some even do their initial crown preps under dam. There is nothing worse than the clamp coming off in the middle of a procedure so if there is any instability or I am clamping an upper 7, RMGIC is used to glue the clamp to the tooth (Figure 13). Pre-wedging taught to me by Dr Clark is a great trick if the dam will not go through a contact or if there is difficulty placing a matix. Simply wedge firmly and wait a few minutes and generally the dam will glide through the contact.

Figure 12. Norland blade compared to traditional 15c and 15.

Conclusion

The use of an OM may seem daunting but we are clever people and with some effort realise the health, communication and technique benefits of this not so new treatment modality. I would like to thank Dr Robin Hawthorne, a Prosthodontist in Macquarie Street, Sydney who first introduced me to the OM. He has been using a microscope with great success since 1982 (and may well have been the first in Australia as far as I know to use one in dentistry).

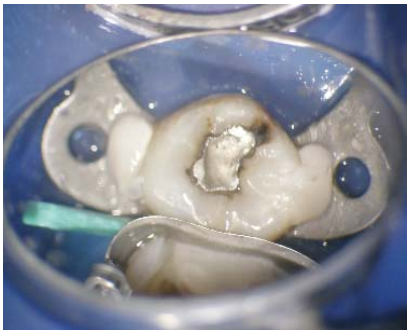

Figure 13. RMGIC used to secure old W2 clamp to lower 7.

About the author

Dr Rick Spencer has been an avid microscope devotee for many years after discovering that its use alleviated chronic back and neck problems that almost ended his career. He has contributed to Australasian Dental Practice in 2003, 2006 and now 2009 on the many benefits of using operating microcscopes for everyday dentistry. Dr Spencer is in private practice with his dentist wife in the Sydney suburb of Strathfield.