

Intraoral Camera Helps Predict and Prevent Tooth Loss

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For many decades the dental profession has enjoyed a high ranking on most consumer opinion polls. However in recent years the dental profession's public image has decreased considerably in the polls.^{1, 2, 3} Perhaps much of this can be traced to a misleading article, and even more misleading treatment of the profession, published by *Reader's Digest* magazine in February 1997.⁴ Not only was the story fraught with inaccuracies, but the fact that *Reader's Digest* decided to publicize this article with a false bright red cover and bright yellow headlines, "Exclusive Investigation -- How Dentists Rip Us Off" carried an even stronger negative message about the dental profession to American consumers.

The overwhelming negative response to this story was addressed and well publicized in dental periodicals, and its conclusions were universally condemned by the profession. However, the nature of the article, which pointed out different diagnoses by various dentists of what they found on a single patient, makes our job of diagnosis even more difficult and ever more important today.

Fortunately, there is one technology that helps us bridge the gap in communication and allows the patient to become a “co-diagnostician” throughout diagnosis and treatment. This involves a “video exam” or a tooth-by-tooth examination using the intraoral camera.^{5, 6} This special-focus exam identifies pathology that even patients can easily see when pointed out by the dentist. Furthermore it allows the dentist to assume a proactive role in predicting what may happen due to certain existing findings. This article will review the advantages of intraoral photography, the basic steps of using this type of diagnostic aid, and how to communicate the findings to the patient.

The intraoral exam should be done quadrant by quadrant, air drying the teeth to be examined prior to using the camera. This reduces light reflection and promotes a sharper image on the monitor. The patient’s head should be somewhat facing the monitor, so he or she can have the same viewpoint as the dentist.

The dental assistant should be seated near the patient’s head, as well as be able to view the monitor (Fig. 1). There is a special advantage for the dental assistant to hold and use a laser light pointer. With this technique, the dentist can maintain steady intraoral position with the camera, especially if the dentist’s left hand is holding out the cheek. The red laser light is especially effective in pointing out defects on the monitor. In addition to pointing out to the patient the conditions that are seen, the assistant writes the findings and proposed treatment on the treatment sequence sheet.

The fact that the assistant uses the pointer illustrates to the patient that the assistant understands and recognizes exactly what the dentist sees.

During the examination the dentist should pay special attention to the presence of 5 conditions:

1. caries
2. microcracks
3. other defects
4. faulty restorations
5. periodontal pathology

1. Caries

Gross caries should be shown to the patient and easily understood. All surfaces (labial, occlusal, lingual, as well as interproximal surfaces) can be seen and should be looked at with the camera. However, beginning caries or questionable areas should also be shown to the patient and documented for possible action or reevaluation at a later date. The images showing the pathology can be saved and stored electronically, as well as a print-out given to the patient if desired (Fig. 2).

2. Microcracks (fracture lines)

Perhaps the most important finding that the intraoral camera can provide is through transilluminating the tooth as it records fracture lines.⁷ Microcracks, or fracture lines, are easily seen by varying the light intensity and the angle in which the camera captures the tooth surface. A simple occlusal amalgam with the microcrack emitting light through the marginal ridge can be a possible beginning of future tooth loss -- particularly if the patient bites on a hard object exactly in the weak point of the fractured area. Explain to the patient that a fracture line in a tooth can be compared to a block of wood. If a hatchet chips down the center, the wood can split. Similarly, a tooth with a vertical fracture line can also split if the patient bites hard on a blackberry seed or any hard object (ice, hard crust of bread, etc.).

Patients need to understand the potential for tooth loss or tooth fracture, thus the intraoral camera makes it easy to understand the need to replace or correct the restoration or support the fractured area. Providing a proactive stance, this is one of the most important benefits of doing the video exam for the patient. It makes it possible for the patient to choose to correct these faulty conditions in the mouth and prevent unnecessary tooth loss or severe tooth fracture. However, in the event the patient chooses not to do so, he or she has been warned of the condition beforehand. Bacteria can also be harbored in this cracked area and not show on the radiograph, again pointing to the possible need for tooth restoration or replacement.

Certainly not every microcrack needs to be corrected and, in fact, most do not. However, it is up to the dentist to help predict which microcracks may eventually cause a problem for the patient. Furthermore, patients who desire to have tooth bleaching should be warned if there are microcracks in the teeth, microcracked areas may absorb more of the bleaching agent and not provide a uniform lightening effect.

3. Other Defects

Defective pits or fissures are usually stained and these should be pointed out to the patient, considering whether caries may exist underneath this stain. Using a cavity-detecting laser (KaVo, Lake Zurich, IL) or caries-detecting solution or gel (Ultradent, South Jordan, Utah) followed by spraying the stain off with air-abrasion, may also help the patient identify caries. In other words, stains should be pointed out to the patient. If before a prophylaxis, then make a note to reevaluate the stain following prophylaxis.

4. Faulty Restorations

A defective restoration can sometimes be seen via stain at the margin of the restoration and pointed out to the patient, especially if it is a tooth-colored restoration. Or sometimes the defect itself is apparent due to too much wear in the restoration and the enamel not being supported by the restoration. The intraoral

camera also makes it easy for both dentist and patient to see defective margins, corrosion or fractures in an amalgam sealant.

5. Periodontal Pathology

The video exam is of special value in showing the patient the difference (if any) in color between his or her healthy tissue and that of diseased gingival tissue. In addition, areas of the cheek, hard and soft palate, should be examined with the patient observing.

Perhaps the greatest value is showing the patient the results of probing a periodontal pocket. Many times exudates can be seen, which dramatically affects the patient's acceptance that disease does exist.

Terminology

Using the term "video exam" is usually not threatening to the patient, plus it also has an easy-to-understand, pleasant sounding name to it. On the other hand, if you tell the patient that you are going to do an exam with an intraoral camera, it has a more clinical and even "invasive" perception. The whole atmosphere of the video examination takes on a more non-threatening, discovery- or explorative-oriented fun atmosphere for the patient. And in the process, the patient's dental IQ considerably is enhanced.

Summary

The video exam has proven to be a most effective means of re-establishing trust between patient and dentist by making the patient a co-diagnostician. In fact, it is not uncommon for patients to stop the diagnosis and ask specific questions about what they see. They can begin to diagnose pathology even before the dentist mentions it. A major benefit to the dentist is that invariably the exam reveals conditions not seen with typical clinical exams even using magnification loops. Although the intraoral camera has been around for more than a decade, its benefit during the video exam is more important now than ever before.^{8,9} Every new patient and all patients of record should have the benefit of a video exam, as well as the dentist.

References

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