control, and no regular maintenance care after implant therapy tend to be at increased risk for peri-implantitis development. Smoking and diabetes have been investigated as additional risk factors but the data remain inconclusive. Regular recall visits should be scheduled and include a clinical examination plus a radiological examination, as indicated, to detect peri-implant disease. Peri-implant tissues will require probing to assess bleeding on probing and to monitor changes in probing depths and mucosal margin migration. Clinicians should obtain baseline radiographic and probing margin measurements after completing implant-supported restorative therapy.

Berglundh T, Jepsen S, Stadlinger B, et al: Peri-implantitis and its prevention. *Clin Oral Imp Res* 30:150-155, 2019*Reprints available from* T Berglundh, Dept of Periodontology, Inst of Odontology, The Sahlgrenska Academy, Univ of Gothenburg, Göteborg, Sweden; e-mail: tord.berglundh@odontologi.gu.se

Clinical Significance

The key characteristics of the peri-implant diseases peri-mucositis and peri-implantitis are important to recognize. Although they are similar to the characteristics of periodontal disease in natural teeth, the altered anatomy related to implant placement makes it more likely to develop a buildup of microbial biofilm and to alter the host-response balance sufficiently to lead to disease. Preventing peri-implantitis should be a primary goal of clinicians who provide implant therapy.

LOUPES

Coaxial alignment

BACKGROUND

Surgical loupes are magnification devices dental and medical professionals wear to observe structures that can't be readily viewed with the naked eye. Usually these loupes consist of frames and carrier lenses similar to those of regular glasses or protective goggles but have binocular magnifying lenses mounted on the frames or fixed in the carrier lenses. The 3 types are lens-mounted (FLM) with full vertical adjustability (FVA) surgical loupes; FLM with limited vertical adjustability (LVA) surgical loupes; and through-the-lens (TTL) surgical loupes. Full vertical movement of the mounted magnifying lenses can be achieved with FLM plus FVA surgical loupes. FLM with LVA surgical loupes cannot achieve full vertical movement but can have the hinges bent between the magnifying lenses and frames to adjust vertically. Because the magnifying lenses of TTL surgical loupes are fused directly into the lenses, they cannot be adjusted vertically except with slight bending of the frames and nosepieces. Surgical loupes are being used more than in the past because they provide visual and postural benefits. However, if the surgical loupes are misaligned, clinicians can suffer postural detriment and reduced quality of care. Research has identified the critical criteria for selecting and adjusting surgical loupes to be working distance, declination angle of the oculars, and coaxial alignment, which refers to the vertical alignment between the magnified image and the observed object. Visual discrepancy can occur when the loupes are misaligned, as can chromatic aberrations of the magnified image. If these aberrations occur, clinicians might experience bright sparks of differing colors in the magnified view. A gap in

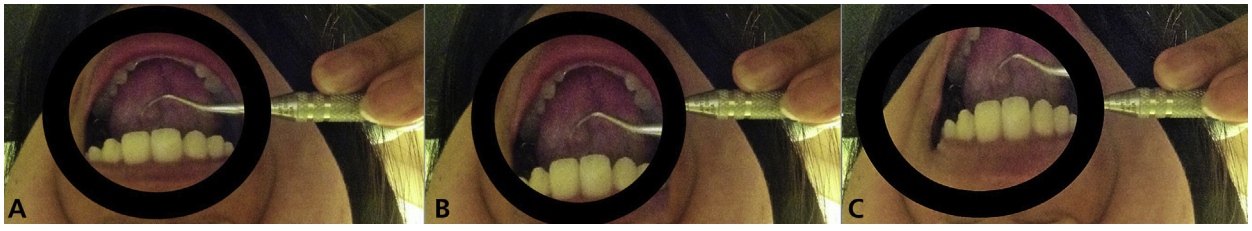

Figure 2. Coaxial alignment versus misalignment. **A,** The magnified image of a dental instrument and the actual instrument in coaxial alignment. **B,** The clinician's view when the magnified image of a dental instrument is lower than the actual instrument because of surgical loupe coaxial misalignment. **C,** The clinician's view when the magnified image of a dental instrument is higher than the actual instrument because of surgical loupe coaxial misalignment. (Courtesy of Wen W, Kanji Z, Laronde D, et al: Out of the loupe: The prevalence of coaxial misalignment of surgical loupes among dental professionals. *J Am Dent Assoc* 150:49-57, 2019.)

research was found to exist with respect to coaxial alignment, so a survey was undertaken to allow clinicians who use loupes to be tested to determine if they were misaligned and to be given the opportunity to have their surgical loupes adjusted.

METHODS

Researchers used an in-person survey and a measurement tool to assess coaxial alignment of participants' surgical loupes. The participants were recruited through posters and e-mails at the University of British Columbia Faculty of Dentistry and e-mails to all members of the British Columbia Dental Association and British Columbia Dental Hygienists' Association. Ninety-seven dental professionals agreed to participate.

RESULTS

Of the 97 individuals, 54 used TTL surgical loupes and 43 used FLM surgical loupes. Among the FLM users, 32 used FLM plus FVA surgical loupes and 11 used FLM plus LVA surgical loupes. Only 17 (18%) were using coaxially aligned surgical loupes. The remaining 82% were using coaxially misaligned surgical loupes and experiencing a visual discrepancy (Figure 2). The prevalence of misalignment was high in all 3 types of surgical loupes.

The severity of the discrepancy being experienced would correspond to the entire working length of a dental instrument. In some cases, the visual discrepancy was equivalent to a patient's maximum oral opening. Twenty-six of the 80 participants using coaxially misaligned surgical loupes consented to have their devices adjusted. Eighteen achieved full coaxial alignment after the adjustment, accounting for 17 using FLM plus FVA loupes and 1 using a TTL loupe. Eight experienced 0.5 through 3.0 units of reduction in misalignment, but their surgical loupes were unable to reach full coaxial alignment. FLM plus FVA loupes were significantly more likely to be adjusted to full coaxial alignment than were FLM plus LVA or TTL loupes.

Clinical Significance

Wearing misaligned surgical loupes can not only affect the quality of care dental professionals deliver to their patients, but can also affect the clinician's health. With misaligned loupes, clinicians can suffer eyestrain, headaches, and vertigo. In addition, repeatedly moving the neck, shoulder, upper arm, and wrist to line-up the instruments and achieve better vision can create repetitive strain injuries or aggravate existing symptoms in the neck and shoulder area. Coaxial misalignment may also coincide with poor declination angles, causing the clinician to bend the neck unnecessarily to look through the magnifying lenses. Unbalanced postures might be assumed and impose tension on the neck muscles, compromise blood circulation, and increase pain, discomfort, and functionality. Spinal injury may also result. If clinicians use correctly aligned surgical loupes, these problems may not develop and musculoskeletal health may even be improved.

DISCUSSION

A high prevalence of coaxial misalignment was discovered among surgical loupe users. The loupes most able to achieve coaxial alignment were the FLM plus FVA loupes. Neither FLM plus LVA or TTL loupes were likely to be adjustable to full coaxial alignment.

Wen W, Kanji Z, Laronde D, et al: Out of the loupe: The prevalence of coaxial misalignment of surgical loupes among dental professionals. *J Am Dent Assoc* 150:49-57, 2019*Reprints available from* W Wen, 1460 Broadway, Flr 12, New York, NY 10036; email: Maggie.wen@alumni.ubc.ca

NONRESTORATIVE TREATMENTS

Clinical practice guidelines for managing noncavitated and cavitated carious lesions

BACKGROUND

Preventing the caries process from beginning should be the primary goal of any caries management plan. However, once the disease is present, clinicians must determine the best approach to stop the process from continuing by applying interventions at the patient level and managing any disease manifestations at the lesion level. Patient-level interventions are designed to reestablish the balance between demineralization and remineralization. Lesion-level interventions can be nonrestorative or nonsurgical and restorative or minimally invasive or invasive. Noncavitated