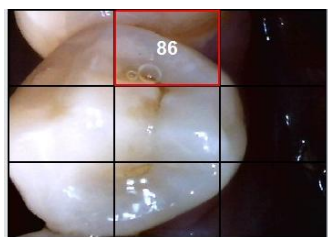


CANARY CASE REPORT: DETECTING PIT AND FISSURE CARIES

Detecting early pit and fissure caries is very difficult. Radiographic imaging is of minimal diagnostic value because of the large amounts of surrounding enamel^{i,ii}. A number of studies have found the dental explorer inefficient for the diagnosis of occlusal caries.^{iii,iv} There are a number of concerns with the use of the explorer in detecting pit and fissure caries:

- Since cavitation in pit and fissure caries occurs late in the disease process, using an explorer stick to detect caries only finds larger lesions;
- Probing an occlusal pit or fissure could convert a small lesion into a larger one^v;
- The probing could produce irreversible traumatic defects in areas that have the potential to remineralize;
- Probing can inoculate the fissure with microorganisms transferred from other intraoral sites^{vi,vii};
- A stick or catch with an explorer may be due to fissure morphology or probe pressure rather than a caries.

An extensive review of the literature by Dove^{viii} found that “overall the strength of the evidence for radiographic methods for the detection of dental caries is poor for all types of lesions on proximal and occlusal surfaces”. He further stated that “it is beneficial only if the intervention is the surgical removal of tooth structure and detrimental if it is used for non-invasive remineralization methods.” The Canary can provide you with an additional diagnostic tool.



86



During a routine Canary examination of a patient, a hygienist decided to scan the pits of the mandibular first and second bicuspsids.

THE FINDING:

The hygienist obtained Canary Number of 86 on the mesial pit of the mandibular second bicuspid, which indicated the presence of caries. The hygienist obtained Canary Numbers below 20 on the pits on the mandibular first bicuspid, indicating a healthy tooth.

THE TREATMENT:

Opening of the mesial pit on the mandibular left second bicuspid revealed a lesion located approximately 1.5 mm. below the surface and extending down 5 mm. This patient had only one restoration in their dentition and was at “low risk” for developing caries yet caries were present and had destroyed a significant portion of the distal aspect of this tooth.

THE RESULT:

The Canary System enabled the clinician to detect the presence of a subsurface lesion that would have otherwise gone undetected with conventional diagnostic methods (radiograph and explorer). Early detection and treatment avoided more invasive treatments such as a large restoration or endodontic therapy.

LEFT: Intra-oral view of the section of the mandibular arch.

CENTRE: Canary Scan results. Canary Number 86 on mesial pit of the mandibular second bicuspid.

RIGHT: Fissure opened to show the extent of the lesion.

ⁱ McKnight-Hanes C, Myers DR, Dushku JC, Thompson WO, Durham LC. *Radiographic recommendations for the primary dentition: comparison of general dentists and pediatric dentists*. *Pediatr Dent*. 1990 Jul-Aug;12(4):212-216

ⁱⁱ Flaitz CM, Hicks MJ, Silverston LM. *Radiographic, histologic, and electronic comparison of basic mode videoprints with bitewing radiography*. *Caries Res*. 1993; 27(1): 65-70.

ⁱⁱⁱ Penning C, van Amerongen JP, et al. *Validity of probing for fissure caries diagnosis*. *Caries Res* 26:445-9, 1992

^{iv} Lussi A. *Comparison of different methods for the diagnosis of fissure caries without cavitation*. *Caries Res* 27:409-16, 1993

^v Yassin OM. *In vitro studies of the effect of a dental explorer on the formation of an artificial carious lesion*. *ASDC J Dent Child*. 1995 Mar-Apr;62(2):111-117

^{vi} Ekstrand K, Qvist V, Thylstrup, A. *Light microscopic study of the effect of probing in occlusal surfaces*. *Caries Research*, 1987; 21: 368 – 374

^{vii} Penning C, Van Amerongen JP, Seef RE, ten Cate, JM. *Validity of probing for fissure caries diagnosis*. *Caries Research*, 1992; 26(6): 445 – 449

^{viii} Dove, S. B., “Radiographic Diagnosis of Dental Caries in Consensus Conference on Dental Caries Management Throughout Life, March 2001, *Journal of Dental Education*, 2001; 65 (10): 985 – 990