

CASE OF THE MONTH (October 2007)

Signalment and History:

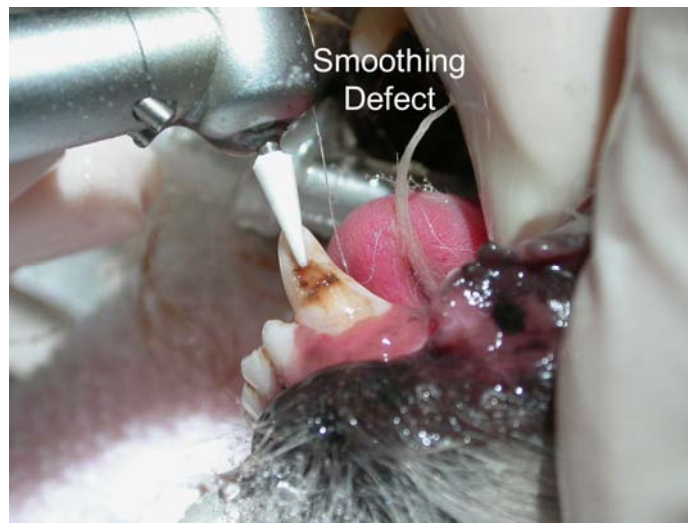
A ten year old neutered male Maltese presented with an enamel defect on the buccal surface of the left mandibular canine tooth. The exposed dentin and the edges of the remaining enamel had picked up a heavy stain as a result of exposure to the oral cavity.



Procedures: An intraoral radiograph was taken in order to assess the endodontic health of the affected tooth. The root canal was normal in size, the periodontal ligament space appeared to be normal, and there was no periapical lucency or any other sign of endodontic disease.



A white stone was used in a high speed handpiece to remove any unsupported enamel, smooth the rough edges, and prepare the defect for restoration. A 37% phosphoric acid gel was used to etch the enamel and exposed dentin. A thin layer of bonding agent was brushed onto the prepared surface and light cured. A composite restorative product was placed into the site, shaped and light cured. A series of finishing disks were used in a low speed handpiece to smooth the surface of the cured restoration. An unfilled resin was placed onto the restoration and light cured to serve as a sealant to prevent microleakage.



Discussion: The duration of the enamel defect in this case was unknown and the etiology was not determined. The defect had the appearance of a lesion seen with enamel hypoplasia. Enamel hypoplasia is a developmental anomaly that occurs when a developing tooth bud is undergoing amelogenesis (enamel formation) and is damaged by an insult such as a high fever or trauma. This insult damages the ameloblasts and leads to abnormal enamel production. Once this damage has occurred, it is irreversible. A tooth's enamel production is completed in its entirety before the tooth has erupted and if the enamel has already been damaged or is subsequently damaged after eruption, it will never be repaired.

Of course this tooth may have been damaged by trauma after eruption. Regardless of the etiology, the very thin (0.3 mm) protective layer of enamel was absent in the affected area. Being the hardest tissue in the body and having an inorganic content of 96%, the primary function of enamel is protection of the underlying dentin. When the enamel is missing, the dentin becomes exposed to the oral environment. Dentin is a very porous material, containing 30-40,000 tubules per mm². These tubules communicate with the pulp and contain endings of nerves that originate within the pulp. Exposure of these tubules can lead to sensitivity and exposure of the pulp to bacterial migration. The bonding agent is a liquid resin which flows down into these open tubules. The light curing gun initiates a polymerization process which transforms the resin into solid plastic plugs which seal the dentinal tubules. The composite restoration fills the defect and lends a more cosmetic appearance to the tooth. The last layer is an unfilled resin that provides a protectant to help prevent bacterial leakage around the margin of the restoration.

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