BIOLOGICAL BARRIER IN ENDODONTIC THERAPY USING COLLACOTE

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INTRODUCTION

When advanced pulp degeneration (hyperemic radicular pulp after pulpotomy or from a necrotic pulp) affects a primary tooth, 2 possible treatment options are available pulpectomy or extraction[1].
The pulpectomy technique involves:
1. excavating the carious tissue;
2. accessing the pulpal chamber;
3. amputating remaining coronal pulp tissue; and
4. extirpating all the radicular pulp utilizing either broaches or handfiles.

Rotary instrumentation has also been advocated for primary teeth[2]. Due to the relatively uncertain location of the anatomical apex[3], working length has been traditionally established by adjusting the stops on the hand files 1 mm to 2 mm short of the radiographic apex. The use of electronic apex locators, however, is currently being advocated for clinical implementation of endodontics in primary teeth[4]. Once thoroughly instrumented and irrigated, the canals are dried with paper points and prepared to receive the filling material. Zinc oxide eugenol, Vitapex ,, Maisto's paste Endoflas, and Kri Paste are examples of resorbable materials indicated for root canal therapy in the primary dentition[5].

The application of the resorbable biological barrier at the apical level is a very common technique after root canal therapy of immature, nonvital permanent teeth[6]. This technique creates a supportive structure upon which restorative materials such as guttapercha can be compacted against. The clinical applications of this concept are promising, as evidenced by the current usage of these artificial barriers in procedures such as apexification of immature permanent teeth and perforative and resorptive defect repairs in mature permanent teeth. CollaCote, Emdogain, and MTA are materials currently being used to treat bone defects associated with endodontic treatment complications. These materials act as an interface between restorative materials and biological tissues[7].

TECHNIQUE IMMATURE PERMANENT TEETH

1) Chemico-mechanical debridment with 5.25 percent NaOCl solution followed by 17 percent EDTA. Apply 2 percent Chlorohexidine to the root canal for 2 minutes, then rinse with NaOCl 5.25 percent.

2) Use gentle pressure to dry the canal with pre-measured sterile paper points to working length.

3) Select the appropriate size plugger to working length (not too large to bind with canal walls and not too small to pierce the MTA).

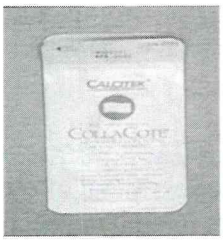
4) Choose the depth of the MTA plug using a Messing Gun that deposits a 3 mm MTA plug to working length.

5) Pack the CollaCote using the pre-measured plugger to working length.

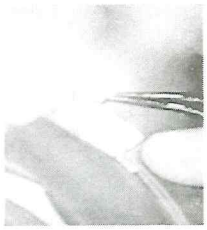
6) Mix the MTA according to the manufacturer?s instructions and load the pre-set Messing Gun.

7) Apply the 3 mm MTA plug to the orifice of the canal and gently tease the material apically until the stopper on the plugger is at the reference point.

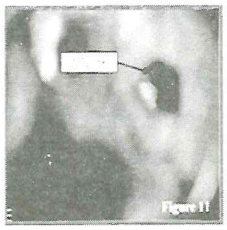
One-step apexification



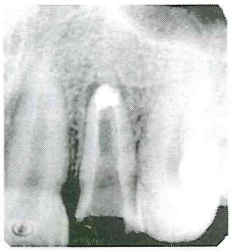
CollaCote ® absorbable synthetic Collagen used to create barrier at the apex



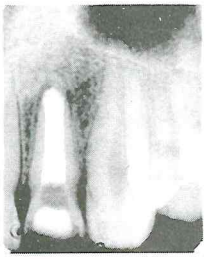
Small piece of CollaCote ® is compacted to the level of the apex using a hand plugger



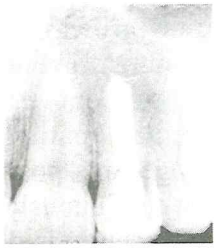
collacote at the apex of tooth



Radiograph to confirm placement of M.T.A.



Completed obturation



Periapical radiograph exposed one year after treatment.

PRIMARY TEETH

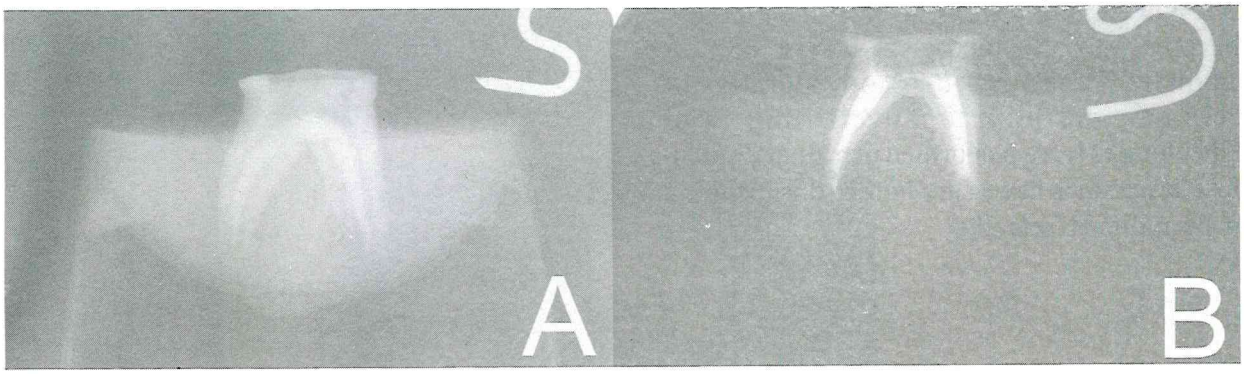


Figure 1a. Preoperative view of tooth .
Figure 1b. Postoperative view: CollaCote was inserted in the mesiolingual canal

8) Verify the 3 mm apical plug radiographically.

9) Fill the remainder of the canal with gutta percha and resin bonded restoration.

DISCUSSION

Colla-Cote, however, is a soft, white, pliable, biocompatible sponge obtained from bovine collagen. It is indicated for application to moist or bleeding clean oral wounds created during dental surgery to control bleeding and protect the wound's surface from further injury. CollaCote is widely used in endodontic therapy (surgical and nonsurgical). When left inside a periapical defect, for example, CollaCote gradually resorbs, providing a scaffold for bone deposition and growth. Roots undergoing resorption present a greater challenge when applying the concept of apical gauging. Physiological and pathological resorptive processes change the position of the apical foramen almost continuously. As a primary tooth begins to resorb, dentin is deposited within the canal and the number, size, and shape of the root canals change. Radiographic apex and actual location of anatomical apical foramina in a primary tooth can be quite different. Clinical studies have examined these differences, and it has been found that radiographic means of tooth length measurements are typically longer than actual tooth length. The means of measuring root canals lengths are very controversial in primary teeth[8].

CONCLUSION

The presence of a biological barrier does not completely prevent, but did significantly decrease, the risk of overfilling when pulpectomies were performed in primary molars. More research is necessary before this technique can be applied clinically.

REFERENCE

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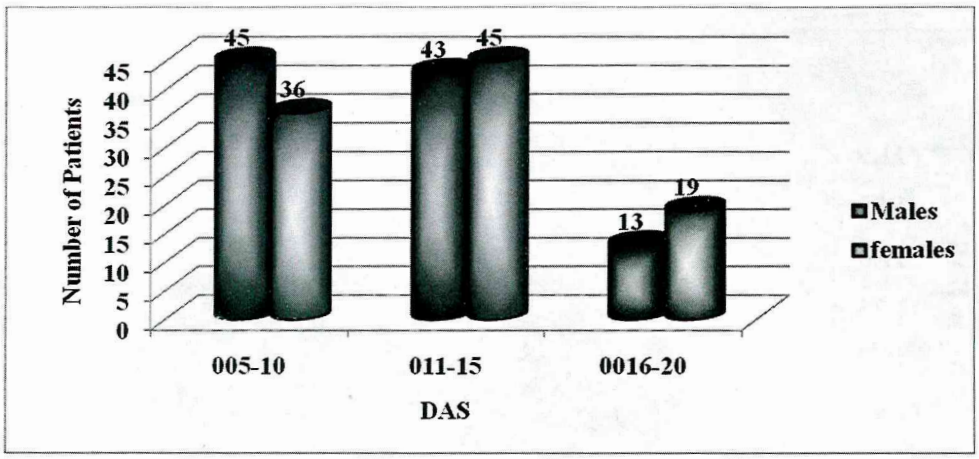
Graph 6: Comparison of male and female patients according to DAS



Discussion

Fear and anxiety seem inseparable. Fear, by definition, is an emotional, physiological, and behavioral response to a recognized external threat. Anxiety, by definition, is an unpleasant emotional state, the causes of which are less clear.[26] Although anesthetics make dental treatment painless and easier to deliver, having such an operation arouses patient's fears and often results in great anxiety. [2] It is now known that fear, anxiety and apprehension only serve to heighten an individual's painful experience. The assessment of dental anxiety is important for two reasons: first, to assist the dentist in the management of anxious patients and second, to provide evidence-based research into psychological construct which has been shown to predict dental avoidance. The intensity of dental anxiety is different among certain groups in population. Several studies have shown that younger group people, people with low income or socioeconomic status, and people with lower levels of education tend to have more severe dental anxiety than people who are elderly, more affluent, or better educated. [2]Many different scales, such as Corah's Dental Anxiety Scale, Kleinknecht's Dental Fear Survey, Spielberger's State-Trait Anxiety Inventory, Litt's Oral surgery Confidence Questionnaire, Gale's ranking questionnaire, Stouthard's dental anxiety inventory, Weiner's fear questionnaire, Morin's adolescents fear of dental treatment cognitive inventory, the Visual Analog Scale , and the Original Questionnaire, have been used to qualitatively or quantitatively measure dental anxiety. [14]But not much has been studied of patients' anxieties about the treatment despite its widespread practice. [5]

Pain and anxiety control involve the application of various physical, chemical, and psychologic modalities aimed at preventing and treating pre, intra, and postoperative patient anxiety pain. Thus far, the efficacy and safety of these techniques as implemented by trained surgeons and dentists have been outstanding. This thrust, in conjunction with an expanding need for anxiety and pain control in ambulatory settings, has led a number of professional and organizations to formulate and publish policies and guidelines for pain and anxiety control in patients.[21] The professional organizations that have developed policies and guidelines for the use of sedatives and anesthetics in dental and hospital settings include the American Dental Association , the American Association of Oral and Maxillofacial Surgeons, the American Academy of Pediatrics , World Health Organization , and the Agency for Health Care Policy and Research . [21]A study by Peretz B and Efrat J concluded that the Corah's Dental Anxiety Scale (DAS), consists of commonly applied questionnaires. [21] According to Corah Norman et al all old and new data were considered in an evaluation of the Corah Dental anxiety Scale. It was found that the DAS is reliable, valid, and a useful predictor of patient's anxiety before treatment, thereby helping the clinician in two ways. One, he becomes awareness patients expectancy, and two, to adopt measures to help alleviate patient anxiety. [8]