

Mona maghraby



بسم الله الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني



Mona maghraby



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

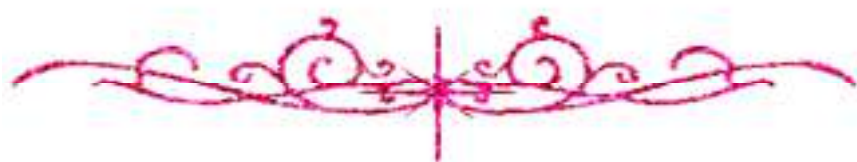
قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأقراص المدمجة قد أعدت دون أية تغييرات





بعض الوثائق الأصلية تالفة
وبالرسالة صفحات لم ترد بالأصل



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**SEALING OF FURCATION
PERFORATIONS USING CO₂ LASER
IRRADIATION**

Thesis

*Submitted in Partial Fulfillment of the Requirement of
Master Degree*

In

Conservative Dentistry

By

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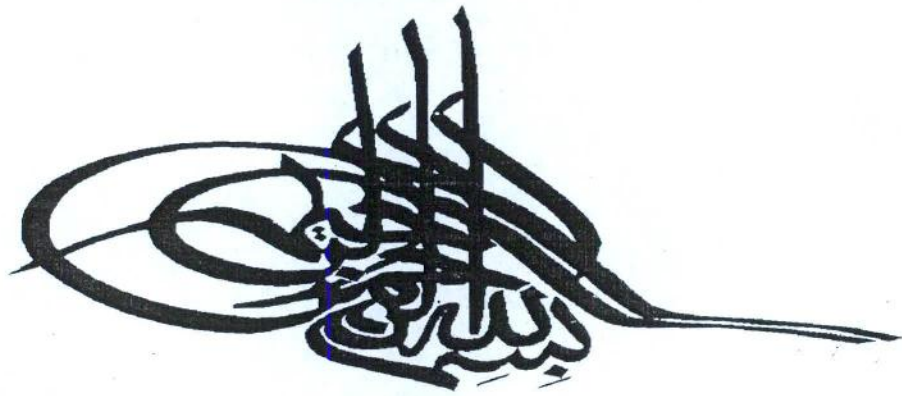
Faculty of Dentistry

Tanta University

2000

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إنك أنت العظيم الحكيم

البقرة (٣٢)

صدق الله العظيم

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Dedication

TO

"MY PARENTS"

AND

"MY CLOSED FRIENDS"

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Introduction

An endodontic perforation may be defined as an artificial opening in a tooth or its root created by boring, piercing, cutting, or pathologic resorption, which result in communication between the pulp canal and the periodontal tissues (*Jew et al., 1982*). In fact, the second greatest cause of endodontic failure have been cited to be perforations (*Ingle, 1961*). These create problems during treatment and often result in secondary periodontal involvement and /or eventual loss of the tooth (*Jew et al., 1982 and Himel et al., 1985*). To avoid this we must have a good knowledge about the objectives of treatment of such cases. One of the main objectives of perforation treatment is to obtain a perfect seal between the dentinal defect and the repair of obturating materials (*Mannocci et al., 1997*).

Perforations may be induced iatrogenically or by resorptive processes or caries (*Sinai & Philadelphia, 1977*). An iatrogenic perforation seriously compromises the prognosis of the involved tooth and requires special attention in diagnosis and treatment (*Benenati et al., 1986*). It is reported to be due to lack of attention to the details of internal anatomy and a failure to consider anatomic variations (*Alhadainy, 1994 a*)

Different materials have been used for intra coronal or surgical perforation treatment both in clinical and in experimental situations. Zinc oxide eugenol, Cavit, Amalgam, Calcium hydroxide, IRM, hydroxylapatite and dentin chips are some examples of these materials (*Monnocci et al., 1997 and Balla et al., 1991*)

Regarding these materials some histological studies demonstrated unfavourable tissue response at the treatment sites , others found acceptable results (*Balla et al., 1991*) .

Looking forward for a new concept for treatment , the clinical use of lasers was found to become more common in the practice of dentistry (*Read et al ., 1995*) . The effects of laser exposure on dentin and potential applications of laser in endodontics has been explored by a number of investigators (*Dederich et al., 1984*) .Number of studies used lasers to seal the dentinal tubules and decrease dentin permeability (*Bonin et al., 1991; Pashley et al., 1992 and Miserendino et al.,1995*). In one of these studies partial occlusion of lateral canal with a glass like material could be seen in one sample (*Miserendino et al., 1995*).

Also, lasers were used to increase resistance of dentin to artificial caries like lesions (*Nammour et al.; 1992*). Another investigator tried to treat root fracture by lasers irradiation (*Arkawa et al., 1996*) . In addition the ability of lasers to create a canal seal by laser fusion of an apical dentin plug were evaluated (*Zakariasen et al., 1985 and Saunders et al.,1995*).

Review

There are different types of perforations that can occur during endodontic treatment. One of these types is apical perforations which are most commonly occur in the apically curved canals where endodontic instruments over size 30 resist bending markedly and tend to straighten themselves, and there is the danger that they may cut a ledge in the side of the canal. If the formation of this ledge is unrecognized by the operator and persists in maintaining the full working length, then perforation becomes inevitable. A less common type of apical perforation occurs when an overly large reamer is used with undue force in a tooth with a fine apex, resulting in splitting of the root end with loss of positive seat for the root filling (*Tidmarsh, 1979*).

Another type is mid root perforation which may result from careless attempts to prepare a canal with a pulp stone, to correct a ledge, or to by pass an isolated instrument (*Alhadainy, 1994 a*). A miss oriented instrument during attempts to locate the root canal may result in creation of a false canal particularly where the canal has an apical curve or dilaceration. Also midroot perforation may occur as a result of misuse of rotary instruments in preparing room for a post or dowel (*Jew et al., 1982*). This type of perforation commonly occur in anterior teeth as occlusion has an influence. Proclined teeth in particular, being likely to suffer perforation of their labial aspect, whereas retroclined teeth may be perforated palatally (*Tidmarsh, 1979*).

Strip perforation is a known type which may be performed as a result of excessive enlargement of the middle third of the canal. Jew et al. reported that this kind of perforation generally occurs in teeth that have a figure-eight shape in cross section, such as the mesial root of a mandibular molar or the mesiobuccal root of a maxillary molar (*Jew et al., 1982*). In these canals endodontic instruments attempt to straighten themselves causing canal ledging or perforation of the furcal wall. The furcal area of the coronal third in a small curved root has been described as a "danger zone" (*Walton & Torabinejad, 1989*). There is less tooth structure in this area compared with the outer canal wall. A tendency to remove dentin from this zone increases the frequency of strip perforations especially with non-straight-line access preparation (*Walton & Torabinejad, 1989*).

However one of the most common types of perforations is the perforation of the floor or wall of the pulp chamber which may occur when the chamber is almost obliterated and greatly reduced in size as a result of aging process in older tooth or as a reaction to trauma in young tooth or to an irritant (*Grossman, 1957*). Measurements between the floor of the pulp chamber and cusp tips can be transferred from a bitewing radiograph on to the shank of the bur, a dab of white typist's ink on the bur shank being readily visible even whilst the bur is rotating. It is important that the floor of the pulp chamber remain untouched by burs for in its natural state it forms smooth funnel-shaped entrances to the root canals. The preservation of this natural form of the floor of the pulp chamber makes subsequent placement of endodontic instruments much easier (*Tidmarsh, 1979*).

If the pulp chamber roof and floor approximate each other perforation may occur from the careless plunging of a bur in a relatively thin floor (*Grossman, 1957*). Perforation may also be created as a result of inadequate access preparation that results in misdirection of a bur while attempting to gain entrance to the pulp canals (*Jew et al., 1982; ElDeeb et al., 1982 and Aguirre et al., 1986*). These perforations are avoided by using the larger sizes of rosehead bur to open the pulp cavity and by directing the bur toward the orifice of the widest canal, that is the distal canal in mandibular molars and the palatal canal in maxillary molars (*Nicholls, 1962*).

Generally there are several precautions that should be taken to avoid iatrogenic perforations:

- Prior to beginning cleansing and shaping of any canal the degree of curvature, the location of the canal within the root mass and the physical size of the root must be evaluated (*Oswald, 1979*).
- Martin et al. stated that the use of heavy pressures with reamers and files should be avoided. These instruments should be used in strict numerical sequence no size being omitted (*Nicholls, 1962*).
- He also advised that care should be used in opening of orifices with the Gates- Glidden drill or other mechanically driven reamers.
- In canals with apical curvature the inflexibility of the instrument will almost certainly result in breakage or root perforation (*Nicholls, 1962*).
- So Grossman recommended shaping the root canal instrument to conform the curvature of the root, i.e., by making a gradual bend at the tip of the instrument (*Grossman, 1957*).

- Cattoni also reported that preference should be given to stainless steel instruments and the use of files which have a working area that will allow maximum flexibility.
- Instruments to be used inside the root canal should not be flamed (Cattoni , 1963). When root filling material is removed during the construction of a post crown, the canal should be periodically cleansed and examined to ensure that the cutting action of the end of the bur is confined to the root canal filling (Nicholls , 1962).

Diagnosis

Diagnosis of iatrogenic perforations requires a combination of symptomatic findings and clinical observations. A clue of possible perforation occurs when a file or a reamer is placed into an opening and the instrument appears to be loose rather than snug as would be expected in a true canal (Alhadainy , 1994 a).

Symptoms of perforations may include a sudden pain response from a previously comfortable patient (Oswald , 1979). Or sudden pain during treatment procedures, which indicates that a file is penetrating the surrounding bone. This response is more likely if little or no local anaesthesia has been used. Another patient response may be to the taste of irrigating solution leaking through a cervical perforation or under leaky crown margin (Alhadainy , 1994 a). An existing perforation that has been left untreated can be detected by the presence of serous exudate in the site of perforation, and chronic inflammation of the gingiva when the perforation has penetrated the alveolar bone.