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**Kerman University of Medical Sciences
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Doctor in Dental Surgery**

Title:

"Comparative Study of pain relieving effect of Dry
Cotton pellet and eugenol Cotton pellet in the reduction
of pain in Emergency pulpotomy "

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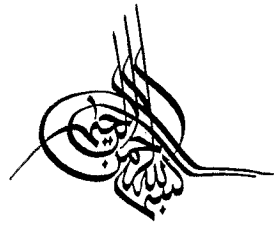
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TITLE

Comparative study of pain relieving effect of dry cotton pellet and eugenol cotton pellet in the reduction of pain in emergency pulpotomy.

DEDICATED TO:

Fond memory of my
reverend father.

The angelic mother ;

And all those who
devoted their time to
make me what I am today.

Acknowledgement: -

The path I tread by the grace of God was brightened by the light of love and sacrifices of mother, Guided by the warm encouragement, care and timely help of father.

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“ Alhamdulillah -i- Rab-al-alameen.”

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Preface

Dentistry is an ever changing field .As new research and clinical experiences broaden, knowledge changes in treatment and drug therapy.

Endodontics is that branch of dentistry that deals with the management of pulpal & perapical tissues of the tooth in variety of conditions like inflammation, infection, trauma etc.

The main objective of Endodontic therapy is restoration of the tooth to its proper form and function in the masticatory apparatus in the Healthy state.

There are three basic phases in endodontic treatment. First is the diagnostic phase, in which the disease is determined, and the treatment plan is developed.

Second phase is the preparatory phase in which the diseased or inflamed pulpal tissues are removed from pulp chamber or canals and the tooth is prepared for the filling material. The third phase: involves the filling of the canals to get hermetic seal with an inert material.

Endodontic emergency is the most sensitive part of endodontics that deals with acute conditions requiring immediate attention and relief, there by opening the path for future elaborate endodontic procedures.

Inflammation and its sequele-that is increase tissue pressure,release of chemical mediators in the pulp or periapical tissues are the major causes of painful dental emergencies. Management of such emergencies for quick relief from pain includes the fallowing steps:

b-Reducing pressure .

c-Removing inflamme d pulpal tissue.

d-Applying suitable dressing on the amputated pulp for the reduction of pain and its preservation for future hea ling.

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CHAPTER-1

Introduction^{1,3,7}

Endodontics is a branch of dentistry concerned with Morphology, Physiology and Pathology of Human Dental pulp and surrounding tissues.²⁶

Its study Encompass the basic and clinical science including – Biology of normal Pulp, The Etiology, the Diagnosis, the Management and the treatment of the disease , injury ,or other unfavorable factors, responsible for pulpal Inflammation leading to acute dental pain and discomfort. Such acute condition which demand Immediate attention of Dentist are called Endodontic Emergencies^{3,7,26}

Endodontic Emergencies are a challenge for both diagnosis and management. Knowledge and skill in several aspects of Endodontics are required for correct diagnosis and treatment to relieve pain.

Dentist must have knowledge of pain mechanism, patient management, diagnosis, anesthesia, therapeutics and treatment measures.

The Endodontic emergency is a matter of concern both to patient and dentist.

True emergency is a condition requiring unscheduled sudden visit to dental clinic for immediate relief of acute pain. Where as urgency indicates less sever problem with tolerable pain which require better planning and treatment schedule.^{27,26}

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There is no doubt that a normally functioning endodontically treated and well restored tooth is vastly superior to the best prosthetic replacement.

The indication for endodontic therapy is legion. Every tooth from central incisor to the third molar is potential candidates for this treatment. Endodontic therapy extends to the dentist and the patient the opportunity to save tooth.³

One of the greatest services that can be rendered by a dentist is saving and retaining the first permanent molar with pulpal involvement by endodontically treating it.³

Bacteria are important causative agents of pathosis of the pulp and periradicular tissues.

Among major elements the role of bacteria and their by-products in dental emergencies is well established.

Pain results from two factors related to inflammation: a. chemical mediators .b. pressure.²⁶

A:chemical mediators cause pain either directly or by lowering

The response threshold of the sensory nerve fibers or indirectly by increasing vascular permeability and Producing edema.

B-Pressure: Edema results in increase fluid pressure which directly stimulates pain receptors. Of the two causes of pain, pressure is the more impōtents.²⁶

Procedure adopted to relieve such acute pain arising from pulpal inflammation(Acute pulpitis) is called emergency pulpotomy.

Pulpotomy technique has become the most accepted procedure for treating primary and permanent teeth with carious or traumatic pulp exposure, and with acute pain.^{3,26}

In such acute emergency situation pulpotomy is performed and a suitable medicament or dressing is then placed over the remaining pulpal tissues in an attempt to reduce acute pain, promote healing and retain the vital pulpal tissues in canal. Dentin Bridge may cover the amputated pulp in future.^{3,26}

The present study is an approach to evaluate the appropriate means for the reduction of pain in acute emergency conditions by comparing the pain relieving effect of two dressing placed on amputated pulp after emergency pulpotomy.

Aims

Main Aim:

Compare the pain relieving effect of dry cotton pellet and eugenol cotton pellet on emergency pulpotomised lower first permanent molar.

Sub Aims:

1. Asses the pain reducing effect of dry cotton pellet.
2. Asses the pain reducing effect of eugenol cotton pellet.
3. Compare the pain reducing effect of dry cotton pellet and eugenol cotton pellet.

Applicatory Aim:

To select the dressing which is best in reducing pain after emergency pulpotomy.

Probability and questions:

1. Dry cotton pellet reduces pain.
2. Eugenol cotton pellet reduces pain.
3. No difference between dry cotton pellet and eugenol cotton pellet in the reduction of pain.

CHAPTER-2

Endodontic Emergencies ^{1,2,7,26}

Endodontic emergencies are those acute painful conditions which require immediate attention of dentist.

Endodontic emergencies are usually associated with pain and or swelling and require immediate diagnosis and treatment. These emergencies are caused by pathosis in the pulp or periapical tissues.

They also include sever traumatic injuries that result in luxation, avulsion or fracture of hard tissues. These are situation in which the patient is seen initially with sever pain and swelling.³

The patients with the fallowing complaints need emergency treatment.^{3,7,26}

1-patients with sever pain at night which disturbs sleep.

2-patients with the feeling of sever pain in tooth on lying down

3-patients with painful tooth disturbing their eating working, concentrating or other daily activities.

4-patients with the complain of short history of onset of acute pain from few hours to 2days.

5-patients with persistent dental pain even after, the use of analgesics.

The acute dental pain arises from inflammation of pulpal or per apical tissues.^{3,26}

Some of the symptoms of in flamed pulp include:

1-prolonged tooth ache on taking hot or cold liquids in the mouth .

2-spontaneouse (unprovoked) tooth ache.

3-pain with chewing or biting .

4- Pain on lying down .

Some of the signs of diseased pulp includes:

- a- Evidence of decay.
- b -Evidence of shadow (abscess) at the end of root in radiographs.
- C-Drainage or swelling for prolonged time.

Pulpal pathosis:^{7,2,6}

Irritation of pulpal or periradicular tissues results in inflammation.

A Part from anatomic configuration and diversity of inflicted irritant,pulp reacts to these irritants as do other connective tissues.

Pulpal injury results in cell death and inflammation. The degree of inflammation is proportion to the intensity and severity of tissue damage. Slight injuries such as incipient caries or shallow cavity preparation, causes little or no inflammation in the pulp.

In contrast deep caries, Extensive operative procedures, or persistent Irritation usually produce more severe inflammatory changes.

Depending on the severity and duration of the insult and the host response the pulpal response ranges from transient inflammation, Reversible pulpitis to irreversible pulpitis and then to total necrosis. These changes often occur with out pain and with out the knowledge of patient, causing spontaneous throbbing and intense pain which is worsened by hot or cold stimuli. When pain is not spontaneous and evoked by stimulus. It may some times outlast the stimulus, this is known as irreversible. If pain subsides quickly on removal of stimulus the inflammation is known as reversible. .Endodontic emergencies are usually in the stage of irreversible pulpitis.^{7,26}

Pulpal pain tend to be diffuse and refereed as the pain increases in intensity it may spread to ear ,temple ,cheek or other teeth although never crosses the midlines.²⁶

CHAPTER-3

Etiology: ^{1,3,7,2,26}

The inflammation of pulp and its surrounding tissues is the result of irritation. The major irritants of these tissues can be divided into living and nonliving.

The living irritants: these are various microscopic organisms such as: Bacterias , viruses ,etc.

The microscopic organisms present in dental caries are the main source of irritation of the dental pulp. The microorganism produce Toxic chemicals that penetrate the pulp through tubules and causes their lysis, leading to softening of enamel and dentine, in due course the microbespenetrate further and Further causing the actual exposure of pulpal tissue and its infiltration.

The pulp in order to combat the infiltration responds immediately but can not eliminate the irritants .this situation is known as acute inflammation which usually require emergency treatment.

-Non living irritants: ^{3,26}

These are mechanical, thermal and chemical.

Mechanical:-pulp is usually irritated by:-

1. Deep cavity preparation:
2. Removal of tooth structure with immense pressure.
3. Impact of trauma.
4. Occlusal trauma.
- 5- Orthodontic movement of tooth.
- 6- Deep periodontal curettage.

Thermal: these include the thermal changes. Caused by: -

1. Improper cooling during cavity preparation.
2. Subjecting teeth to too hot or too Cold Beverages.

Chemical:

Chemical irritants of the pulp include various dentin cleansing, sterilizing, and desensitizing substances as well as some of the substances present in temporary and permanent filling materials and cavity liners. Antibacterial agents such as silver nitrate, phenol with and without camphor, and eugenol were used in an attempt to "sterilize" the dentin after cavity preparations. However their effectiveness as dentin sterilizers is questionable and their cytotoxicity can cause inflammatory changes in underlying dental pulp. Other irritating agents include cavity cleansers such as alcohol, chloroform, hydrogen peroxide and various acids, chemicals presents in desensitizers, cavity liners and bases,as well as temporary and permanent filling materials.^{3,7,26}

System of Diagnosis: ^{3,7,26}

Patients in pain provide information and responds that are exaggerated and inaccurate. They tend to be confused as well as apprehensive .It is easy to rush through Diagnosis to institute treatment for a suffering patient in acute Emergency condition but for elaborate endodontic treatment a thorough investigation Interrogation, and examination is a must for correct diagnosis and exact treatment plan.

After pertinent information regarding medical and dental histories – subjective and objective examination should be performed carefully and completely.²⁶

The rule of the true emergency is:

One tooth is the offender (source of pain)

In the excitement of the movement, the patient might believe that severe pain is emanating from more than a single tooth.

Diagnostic Sequence:^{7,26}

This includes the following:²⁶

1. Obtain pertinent information about patient's medical and dental histories.
2. Ask pointed question about patients' pain. History, Location, Severity, Duration, Character of Eliciting stimulus.
3. Perform an extra oral examination.
4. Perform an intra oral examination.
5. Perform pulp testing as appropriate.

Use palpation, and percussion, sensitivity test to determine periodontal status.

Interpret appropriate radiographs.

Medical history: - Appropriate medical history is important prior to any dental treatment.

This include Questioner about systemic diseases like _ Cardiac, Pulmonary, gastric, Renal, Diabetes, AIDS, etc.

Medical complication can be over looked in an emergency situation.

Diagnostic out come:

Careful working through sequences described above –The diagnosis is confirmed, the offending tooth is identified, source of pain scrutinized treatment plan is ascertained.

Pulp Vitality Testes²⁶

Direct dentin stimulation ,cold, heat ,and electricity determine the response to stimuli and occasionally can identify the offending tooth by an abnormal response ,response does not guarantee a pulp’s viability or health but at best indicates the presence of some nerve fibers carrying sensory impulses. There is wide variation in the pulpal response of both normal and pathologically involved teeth .Because of inherent limitation,these tests should always have adequate controls, and results should be interpreted carefully.

Table 3-1 physical status classification⁷

| ASA Class | patient Description | clinical Examples | Clinical Management |
|-----------|---|---|---|
| 1. | A normally healthy patient | No organic, physiologic ,biochemical , Or psychiatric disturbance ; treatment Is for localized disorder | Routine care |
| 2. | A patient with mild systemic disease | Controlled essential hypertension, Pronounced obesity, psychiatric disturbance | Routine care but limit stress and length of appointment |
| 3. | A patient with sever systemic diseases that is not incapacitating | sever diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease | strict limitation of complex procedures ; careful anxiety control |
| 4. | A patient with an incapacitating Systemic disease that is a constant Threat to life | Acute myocardial infarction, advanced pulmonary, cardiac ,hepatic ,or renal insufficiency | Emergency or usually in a |
| 5 | A moribund patient who is not Expected to live 24 hours with or Without operation | Uncontrolled massive internal bleeding ,rapidly progressing cardiac insufficiency with renal Failure | Emergency life |

CHAPTER 4

Pretreatment requisites: ²⁶

Psychological components of pain perception and pain reaction comprises cognitive emotional and symbolic factors. The pain reaction threshold is significantly altered by past experiences and present anxiety level and emotional status. To reduce anxiety and consequently obtain reliable information about chief complaints and to receive co-operation during treatment it is necessary to:-^{3,7,26}

1. Establish and maintain control of situation.
2. Gain confidence of patient.
3. Provide attention and patient.
4. Treat the patient as an important individual.

By this way pain perception and pain reaction threshold are raised significantly. Greatly facilitating the procedure. Psychological management of the patient is the most important factor in Emergency treatment.

These emergencies require a diagnosis and treatment sequencing. Each step is important (1) categorizing the problem, (2) taking a medical history, (3) identifying the source, (4) making the diagnosis, (5) planning the treatment, and (6) treating the patient.

Treatment Plan. ^{3,7,26}

As previously discussed, inflammation and consequences, that is, increased tissue pressure and release of chemical mediators in the pulp or periradicular tissues, are the major causes of painful dental