



PULP VITALITY TESTS - A REVIEW

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ABSTRACT

A major, and essential, part of the diagnostic process for pulp disease is the use of pulp sensibility tests. When diagnosing pulp pain, these tests can be used to reproduce the symptoms reported by the patient to diagnose the diseased tooth as well as the disease state. However, a major shortcoming with these tests is that they only indirectly provide an indication of the state of the pulp by measuring a neural response rather than the vascular supply, so both false positive and false negative results can occur. This review article will give an idea about pulp vitality and their testing.

Key words:

Pulp, Vitality, Sensibility, Sensitivity, diagnosis, tests

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INTRODUCTION

Since the evolution of dentistry, the main reason for any form of dental treatment has always been the relief from pain. Therefore, the main priority in the dental profession is relief of oral pain. Pain is a complex phenomenon, and dental pain, a multifactorial or multidimensional experience, involves sensory responses and emotional, conceptual, and motivational aspects.¹

The dental pulp is a vascularised tissue that reacts to chemical, biological & physical stimulus, and it helps in healing by a hard tissue formation as a barrier. The capability of healing, in case of a severe stimulus or damage, is excessive, and it can lead to an irreversible inflamed condition, and later may become necrotic. Therefore, knowing the status of the vitality of the pulp is a very important & crucial diagnostic procedure.

By examining the histological sections of the tissue specimen, one can view the extent of inflammation, or the presence or absence of necrosis, and this is the most precise way of evaluating the status of the pulp.

Importance of Vitality of Pulp

Ehrman in 1977 quoted that No examination of the mouth is complete without vitality tests being carried out on each tooth. After the development of the tooth, the cells of the pulp maintain tissue homeostasis, underpin the defense reactions in response to injuries like caries. The vital pulp in the entire course of life of the tooth, produces reparative dentin, as a response to any kind of stimulus, biological or pathological.

Assessment of the pulp vitality is complex, since the pulp tissue is enclosed in a calcified structure. Hence, the methods like electric pulp testing, application of thermal stimulus, etc all depend on the patient's perception of peripheral nerve stimulation.²

Diagnostic Objectives of Pulp Testing

Assessment of Pulp Health Based on Its Qualitative Sensory Response:

The assessment of pulp health based on its qualitative sensory response is commonly done:

1. Prior to restorative, endodontic, and orthodontic procedures,
2. As a follow-up and for monitoring the pulp after trauma to the teeth,
3. In differential diagnoses, such as excluding periapical pathosis of pulpal origin.³

Pulp Vitality Testing: Assessment of the Pulp's Blood Supply. Pulp tissue may have an adequate vascular supply, but is not necessarily innervated. Therefore, almost all the recent pulp testing methods, do not assess the vascularity of the pulp directly. This can be explained by observations made clinically, that a traumatised tooth can have no response to a stimulus like cold for some period of time after the trauma.

Pulp Sensibility Testing: Assessment of the Pulp's Sensory Response.

Sensibility is defined as the ability to respond to a stimulus, and hence this is an accurate and appropriate term for the

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typical and common clinical pulp tests such as thermal and electric tests given that they do not detect or measure blood supply to the dental pulp.⁴

Pulp Sensitivity: Condition of the Pulp Being Very Responsive to a Stimulus.

In an attempt to diagnose a tooth with pulpitis, thermal & electric pulp tests can be used as sensitivity tests, since such a tooth will be more responsive than normal. A clinician will assume that the pulp tissue has a viable blood supply, & it is inflamed or healthy, if it responds to a stimulus and depending on the nature of the response like pain, duration of pain, the history and other findings.

The three types of responses can be summarized as follows:-

1. The pulp is deemed normal when there is a response to the stimulus provided by the sensibility test and this response is not pronounced or exaggerated, and it does not linger.
2. Pulpitis is present when there is an exaggerated response that produces pain. Pulpitis can be considered as reversible or irreversible, depending on the severity of pain and whether the pain lingers or not. Typically mild pain of short duration is considered to indicate reversible pulpitis while severe pain that lingers indicates irreversible pulpitis.
3. The absence of responses to sensibility tests is usually associated with the likelihood of pulp necrosis, the tooth is pulpless, or has had previous root canal therapy.⁵

CONCLUSION

The pulp tissue is an important and helpful aid in diagnosis in endodontics. Most of the dentists give less attention to the diagnosis of the status of the pulp, and wherever doubt is present, a root canal treatment is performed. The profession needs to re-evaluate its attitude towards diagnosis of pulpal and periapical conditions for the benefit of patients and for better prognosis.⁶

If there is a doubt regarding the diagnosis and status of the pulp, a combination of sensibility cold tests and electric pulp tests or a vitality test and a sensibility test combination should be used. One should not rely on only one diagnostic test, even if it is a complicated or an uncomplicated case. Therefore before starting any treatment, one should use minimum two independent diagnostic tests and should be correlated to come to a final diagnosis. A pulp test cannot be used as the only method to establish a final diagnosis, but it surely provides a useful information.⁷

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