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Practise of Pedodontics with Endodontics: the Synthesis

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ABSTRACT

In this essay, the opinions of the attendees of the Workshop on the Biologic Basis of Modern Endodontic Practice have been collected, correlated, and summarised. The position and review papers presented during the workshop, the consensus of the workshop attendees, and the author's specific subject-matter experience were combined to create this synthesis.

1. INTRODUCTION

It can be challenging, if not impossible, to resolve a problem where two professions assess the same body of knowledge yet reach conflicting results. Such viewpoints result from the prejudice that both parties have inherently, which leads them to interpret scientific facts in a way that only supports their own positions. In this workshop, it has been mentioned that endodontists believe paediatric endodontics should follow the same rules as endodontic therapy for adults, where biologic concepts are well established. However, endodontists readily acknowledge how challenging and impracticable it is to regularly apply these concepts to paediatric patients, whose need for endodontic care is frequently just as urgent as that of an adult. The pedodontist, on the other hand, seems willing to compromise these principles and occasionally to create new ones (which have been supported to the pedodontist's satisfaction), in order to provide the service he believes most endodontists have given up. As a result, references to a "dual standard" in the endodontic treatment of juvenile patients are still made. Endodontists vehemently reject this contradiction since, by definition, it belittles their commitment to ethical practise. Practically speaking, it seems true that the majority of the young patient's teeth are being treated using methods that many endodontists may find objectionable but have little influence over. The goal of this workshop was to thoroughly analyse these procedures in order to determine whether there is a sufficient biological basis for their acceptance or whether the available data points to their restriction, if not outright withdrawal [1].

It is commonly acknowledged that youthful dental pulp particularly that in deciduous teeth, has a high chance of recovery. Evidence has been provided that this tissue is highly cellular and highly vascular, at least in the stages before the roots have undergone substantial physiologic resorption. As a result, techniques like direct and indirect pulp capping and

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pulpotomy, which are concerned with maintaining the vitality of the pulp, lend themselves most readily to young pulp [2].

2. DISCUSSION

It has been well-documented that the restoration of the pulp after removal of all contaminated dentin that isn't exposed returns the pulp in many cases to a satisfactory state histologically and physiologically. Clinically, however, it is impossible to predict the pulp's capacity for regeneration or to guarantee that all contaminated dentin has been removed. Removal of such decay can be be described as a hazy attempt to remove all softened dentin at best. Therefore, what might be a technically sound method of vital pulp therapy in practise is still a fluid and unpredictable thing [3].The conflicting views on whether or not to re-enter the treated region to assess the condition of the cavity base reflect this uncertainty. Even if it is evident that reinstrumenting the cavity offers an additional risk to the pulp's health, it must also be kept in mind that the continuation of active caries might be harmful. Both methods would have to be acknowledged until the clinician is given some certainty that all infection has been stopped [4]. The challenges involved in treating the exposed dental pulp are similar to those faced by treating the unexposed pulp in many ways. Despite efforts to outline clinical standards for pulp capping, it is impossible to predict the pathologic state and, consequently, the coronal pulp's capacity for biologic healing [5]. Again, the prognosis of such treatment is still unknown to the practitioner despite the scientific evidence supporting the effectiveness of capping techniques. Because of this ambiguity, pulpotomy treatments in the deciduous teeth have gained support as a way to treat a serious exposure [6]. It also supports the use of similar techniques on exposed, healthy, partially grown permanent teeth in order to preserve the radicular pulp's odontogenic potential [7, 8, 9]

The debates surrounding essential pulp therapy have not been as loud when it comes to the surgical removal of dental pulp than when it comes to the medications or substances that should be utilised therapeutically to treat it. Here, both pragmatism and esotericism must be taken into account. The preservation of the vitality of the tooth pulp is without a doubt the most important factor to take into account when treating it. This does not indicate that the pulp needs to be rehoused in an enclosed calcific chamber [10]. However, in reality, the pulp is in a hostile and unstable environment. Re-exposure of the cavity floor due to intrinsic or induced leaking in the coronal restoration in such a setting increases the risk of additional harm to the pulp. Due to this, total biologic sealing of the exposed site is at the very least desired, if not always attainable.

Biologically, however, it must be acknowledged that despite the significant deposition of mineralized tissue at the site of lesion, continuity of the dentin is not frequently attained with present procedures. Furthermore, it must be acknowledged that the region below the bridge may continue to be damaged and irritated to the point where pulp necrosis may eventually take place. Because of this, we are unable to interpret the presence of a bridge as a sign of effective therapy or its absence as a sign of ineffective therapy [11].

The effectiveness of the more modern chemicals currently used for pulp capping appears to be positive. But given the scant evidence now available, their use must still be regarded as experimental. In several investigations, substances like zinc polycarboxylate cement and isobutyl cyanoacrylate showed the potential to cover the injured pulp with an impermeable

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protective layer without causing further pulp injury. As a result, they enable the production of a dent in bridge that is more regular and comprehensive than the one that is frequently observed with calcium hydroxide. Although these preliminary reports are positive, it is yet too soon to recommend these agents for general use [12].

On the basis of biological considerations, it is not advised to treat the dental pulp or periapical tissues in either permanent or deciduous teeth with potent, extremely irritating medications. The tissues that are exposed to substances like phenol, creosote, formalin, or mixtures like formocresol suffer significant damage. Their general use in adult endodontics has decreased because of this, which is well supported in the scientific literature. Why therefore is formocresol becoming more and more common in pulp therapy for deciduous teeth? And why does this procedure seem to have worked?

The first element of this question's answer relates to how simple this medication is to use and the histology data that has been provided to support it. The first of these two variables cannot be refuted empirically and its importance as a service to the broader public cannot be downplayed. However, the proof that backs up their biological use is not as well-defended. Drug exposure causes necrosis in tissues. Tissue protein denaturation appears to come before this.

Since this happens quickly, there is no inflammation of the tissue and no subsequent release of proteolytic enzymes. As a result, the tissue does not degrade and appears "frozen" or mummified to some.

No matter how it seems, it eventually turns necrotic. The amount and severity of this necrosis have not been determined in current investigations, hence the usage of medications that have this effect must likewise be viewed as biologically unpredictable. According to studies, the still-viable tissue beneath the necrosis experiences persistent chronic inflammation from time to time, and some of the necrotic tissue may occasionally be replaced with connective tissue or bone. Most often, there is still a lot of necrotic tissue. If this tissue becomes contaminated by microbes, it might serve as a growing environment for bacteria. Since most deciduous teeth have a very short lifespan and it takes time for such an infection to develop into a disease, there may be at least a practical case for supporting the formocresol pulpotomy in these circumstances. However, until more data is available, its long-term use in permanent teeth would have to be questioned.

The removal of all pulp and d4bridement of the root canal area is now the most ecologically acceptable approach of treating either deciduous or permanent teeth in which the pulp is thought to be expendable [13].

This session has brought up the fact that doing so in the deciduous teeth presents significant challenges. It has been acknowledged, nonetheless, that complete dhbridement in the permanent tooth would be equally challenging. Therefore, it is clear that the degree of debridement needed for healing may vary, and there doesn't seem to be any proof that deciduous teeth can't achieve a level of debridement that is deemed appropriate. But the deciduous tooth's filling of the prepared root space presents more of a challenge. The impact of extruded filler materials on the eruption process and the importance of residual material on the tissues of the periapex need to be better understood [10].

It has been demonstrated from a biological perspective that it is occasionally undesirable for root canal filling material to extend into the surrounding periapical tissues of permanent teeth. We cannot support the presence of such material in the periapical tissues of deciduous teeth, whether it was done so on purpose, accidentally, or through physiologic resorption of the

deciduous root, unless there is proof to the contrary. Such a process would at most have to be regarded as dubious with the understanding that additional investigation is required.

3. CONCLUSION

In conclusion, let me say that despite our seeming expertise in research, a lot of what we do clinically is still based on empirical and prejudiced judgement. In the field of pedodontic endodontics, it is clear that much has to be learned and changed. Cooperation in the area should be aggressively fostered since it is fair to believe that neither the pedodontist nor the endodontist will forsake interest in the field and because the knowledge to be obtained will be of essential interest to both. The conversation that is thus opened up should be mutually stimulating and aid in bridging the gaps that currently seem to be growing.

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