

Introduction:

It was following an apical leak during a technique of total pulpectomy carried out about 18 years ago on an inferior molar, which was developing in a worrying fashion, that the idea was born of updating “PULPOTOMY”.

There are numerous other strong reasons that were taken in to consideration to develop a material to perform successful long term Pulpotomies such as:

In Children:

Keeping of children’s pulp viable in temporary teeth with incomplete development of roots is the most actual thing because only at the condition of the normal functioning of the root pulp the final development of a root, closing of the apical opening and development of the valuable peridental membrane are possible.

Pulpectomy procedure is always just a compromise but which taking proper indication into account, is preferred to an extraction. Still, pulpectomy procedure proves to be long and complicated and has remained controversial for a number of reasons. Mainly, the perceived difficulty of behavior management in the pediatric population and uncertainty about the effects of root canal filling material and instrumentation on the succedaneous teeth. Anatomic situations like the often complicated curved and tortuous shape of root canals and the closeness of the advancing tooth buds make the treatment more difficult. Another limitation is the apparent connection between the coronal floor with the intraradicular area with the presence of multiple accessory canals and ramifications as well as the difficulty in obtaining hermetic seal due to lack of apical closure following physiologic root resorption have surely added reluctance among dentists to use this procedure. Hence, the use of such procedure should be discouraged. The literature on pulpal treatment for primary teeth predicate on the premise that the pulp remains vital or that a portion of it will retain vitality after therapy. The pulp and pulpal reactions in primary teeth differ markedly as it inflames more easily, degenerates more readily and reacts less favorably than that of permanent teeth. The high degree of cellularity and vascularity is an asset to high potential of repair. As such the young pulp lends itself most readily to procedures concerned with preservation of pulp vitality

In Adults:

Viable pulp in root canals serves as safe barrier for germ intrusion into peri-apical tissues preventing from development of dental infection. Infection of tissues surrounding roots of the temporary tooth makes a big danger for rudiments of permanent teeth as may tend to violation in the normal development even to loss.

Dentists deal with the need of the vital amputation in the adult practice at treatment of molars quite often, having canals of the complex shape and inaccessible for valuable root canal treatment with difficult access.

Number of ailments related to the pulpitis is nowadays about 40% as illustrated by the stomatological practice (E. Borovsky and others, 2002). Currently the most commonly treatment method as to all forms of the pulpitis is a vital and devital extirpation. These methods offer some advantages but also having substantial shortcomings such as: need for a wide range of the expensive endodontic tools, possible tooling damage within a root channel, complications related to some under- or oversealing of the channel, labour intensiveness, duration and expensiveness of the treatment process.

The preservation of the vitality of the root section of the pulp ensures normal tropism of the tooth tissues and inhibits the development of periapical complications (M.M. Krashennikova, A.B. Shekhter, 1973). Studies by a number of authors have revealed that the root pulp after vital pulpotomy retains its vitality, producing

secondary dentine.Â A dentine bridge forms on the boundary between the pathologically transformed and the vital tissues (A.S. Grigoryan, 1965; Z. Pavica, P. Junters, 2000).

Situation:

The above situations has led to investigate the possibilities of perfecting a material with simplified procedure, capable of compensating for the inconveniences, and there by preserving the vitality and promote pulp tissue healing. To overcome the difficulties, preparations containing antibiotics and corticosteroids have been proposed as the alternatives with the possibility of active suppression of acute inflammation thereby preserving the vitality of pulp that has been **“regarded as irreversibly inflamed”**.

Dentists did not possess materials meeting all demands in full for vital amputation of pulp till now. The preparation used shall provide haemostatic, anesthetic, antiphlogistic and long-term antiseptic state of pulp’s stump and its hermetic closing.

Revolution:

“Pulpotomy” has hence replaced pulpectomy which of course represents decisive advantages, in particular for the treatment of infected teeth.

In Pulpotomy treatment with Pulpotec, we recommend its application in vital teeth (molars) treatment, as well as in treating infected deciduous teeth.

Hereafter some arguments gathered from literature :

« The vital pulp is by far the best canal obturation. »

Prof. Marmasse’s statement

« The vital pulp has got a healing capacity so far it is in a sterile environment and hemostasis is achieved during the preparation of the pulp chamber. »

Warfvinge 1986, Snuggs, Cox, Powell, Kevin 1993

Designed and used for more than 20 years, Pulpotec has been commercialized for 10 years now. It has been distributed in more than 60 countries and we estimate the number of treatments to exceed 5 millions (2010).

Prescribed as permanent treatment, Pulpotec was object of numerous clinical applications for 10 years, showing clearly its efficiency. Furthermore, a radiographic file compiling several hundreds of cases, certain of which performed and monitored for a period of 20 years (see X-Ray file) confirm its efficiency and properties.

Of course, it is impossible to know the proportion of those, amongst the millions of molars treated, which underwent in addition a complete restoration of the tooth, by placing a prosthesis (crown or bridge). However, we can affirm that we have never heard of any failure occurred during such a restoration.

And , Of course, the practitioner’s diagnoses and work count for major importance in the treatment’s success (this is obviously also valid for total endodontics treatment) which in our case has to assure:

- an uncompromising initial diagnosis.
- a pulpotomy carried out scrupulously, using sharp-cutting instruments to assure a clear section, without tearing radicular fibres, and taking care of efficiently removing all the cameral pulp.
- A permanent obturation, covering the Pulpotec, being perfectly tight.

Pulpotomy	Pulpectomy
A sensible choice	A risky choice
No risk of root canal infection	Risk of root canal infection
Keep the barrier of the vital radicular pulp	Risk of untight obturation
Safety at the apical level	Risk of protrusion of dental material
Minimize the iatrogenic risks (breaking of instrument, perforation, apical protrusion, etc.)	Surgical risks (breaking of instrument, perforation, apical protrusion, etc.)
Ensure the possibility of a subsequent treatment by pulpectomy “in case” of failure that can only be caused by poor diagnosis	Tough post-and re-treatment
With Pulpotec: rate of success of more than 90%	Rate of success obviously lower!

Pulpotomy treatment with Pulpotec (when applied as indicated) is aimed for the big majority of general dentists for whom it presents decisive benefits

How is the Pulpotomy with Pulpotec Performed?

Instructions for use

Perform pulpotomy in the usual way, a rubber dam is not necessary. Utilise high-speed rotary instruments in order to avoid tearing the radicular fibres and take care to eliminate all the cameral pulp.

1. Local Anesthesia



Then, 2 methods can be recommended for inserting Pulpotec into the pulp-chamber:

Traditional method

2. Remove the roof of the pulp chamber by means of a surgical bur, Tungsten Carbide, FG, (white shank).



3. Excise the vital pulp from the chamber by means of an "Endo" bur, Tungsten Carbide, FG, (yellow shank).



4. Shape the pulp chamber by means of a diamond bur "pear-shaped", FG, ISO 018.



5. Mix Pulpotec liquid with Pulpotec powder and blend to obtain the required thick, creamy consistency of the paste. Insert the paste into the pulp-chamber with a large sized paste filler (ISO 090). The presence of small quantities of blood does not affect the efficiency of Pulpotec. Air-dry the cavity just prior to applying the paste.



6. Seal with a temporary cement.



7. Place a cotton roll between the 2 dental arches and request the patient to bite progressively but firmly, so that the Pulpotec paste clings to the walls of the pulp-cavity as well as to the root-canal orifices.



8. Eliminate any excess cement.



9. The second session should take place once initial Pulpotec insert has set (about 7 hours). The treatment can then be completed by setting the final tight obturation with amalgam or any other suitable material. This can be directly placed on the Pulpotec after removing any excess temporary cement. Leave a thin intermediary layer of temporary cement to insulate Pulpotec from the final obturation material. Though not totally necessary, a fixed prosthesis is recommended in order to ensure tight sealing, resistance and long-term results.



Simple method

Another efficient but *simple method* for inserting Pulpotec into the pulp-chamber: mix the powder and the liquid on a glass slab and blend until the mix reaches the consistency of a small, supple ball of putty. Shape the ball into a cylinder and insert directly into the pulp-chamber. Press into place with a spatula and continue as indicated above with the temporary cement and the cotton roll.

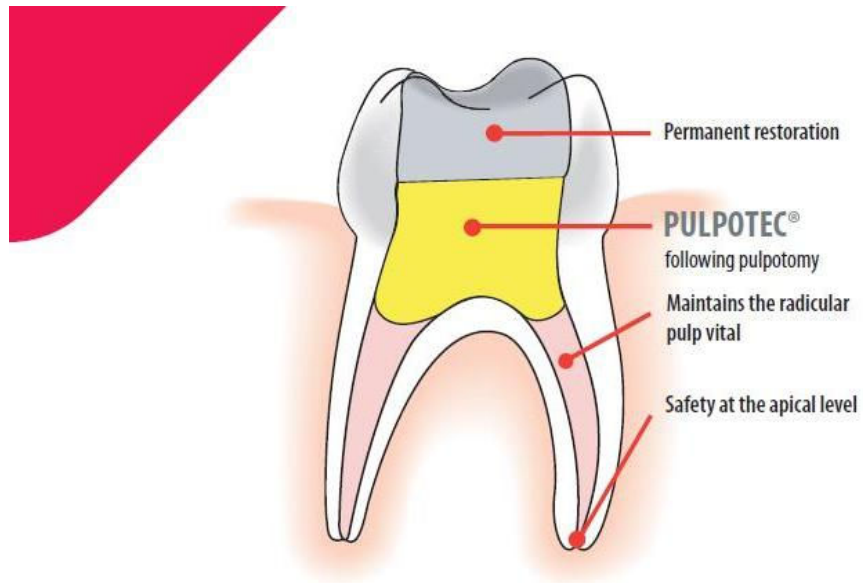
Conclusions:

Based on the facts established in significant literature, largely confirmed by clinical studies carried out for more than 10 years, and strengthened by an experience of close to 20 years, showing a high therapeutical success rate on more than 5 millions (evaluation) treated teeth throughout 60 countries, and, finally, taking into account the total absence of negative reports clinically or scientifically documented, we are authorized to conclude that:

- Pulpotec satisfies in its current conception and composition perfectly the requirements of the treatment for which it is aimed.
- The contra-indications and possible side-effects are all described, in particular in the directions for use, and, to our knowledge, no other than those exist.
- Due to the confinement of the preparation, thanks to pulpotomy, in a tight cavity, limited towards apical direction by the barrier formed by the underlying radicular pulp, any diffusion of one or more components into periodontal or periapical tissues is impossible. The more so as Pulpotec sets within a maximum of 7 hours, entrapping the components in a dried cement.
- The main portion of the underlying radicular pulp remains vital, allowing the survival of the tooth, and, in the case of an immature tooth, a **complete apexification**.

Efficiency, success rate, non toxicity and benefits of Pulpotec should not be considered competitive towards total endodontic treatments which keep their importance and applications. It is up to each dentist to choose the appropriate treatment based upon its convictions, education and experience.

Pulpotec is considered to be a new and proven method, inspiring to “**Think different**”.



THINK DIFFERENT

Save the tooth
Minimize the surgical risk
Eliminate the risk of root-canal infection
Save time... and money



Swiss quality
dental products