

## Clinical Considerations in Endodontic Retreatment and Retreatment Methodologies

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All around the world millions of teeth receive root canal treatment annually and in recent decades also the number of retreatment cases increased tremendously versus endodontic surgery or extraction in case of failure of those endodontic treatments. Increasing the knowledge of root canal systems, treatment methodologies, obturation techniques, using smart and better materials than before, new techniques and technologies in endodontics enhanced the percentage of success in endodontic therapies but still many teeth need endodontic retreatment because of the substandard and failed root canal treatments which were previously received. Following the evaluation and analyzing the reasons of the endodontic failures the alternatives are non-surgical retreatment, surgical retreatment and extraction. During the non-surgical retreatment removal of the materials from the root canals, finding out the missing canals and repairing the defects are the essential steps.

In recent decades by using the operation microscopes, micro-instruments, and sophisticated retreatment techniques and materials in routine daily practice have been increased the percentage of the decisions of non-surgical retreatment versus endodontic surgery or extractions. In non-surgical retreatment after disassembling and removing the posts which was applied previously, obturation materials the clinicians have more opportunity to find, locate and negotiate the missing canals by using the most relevant technologies, better designed equipment and some more precised techniques and protocols which were developed for endodontic retreatment.

In some retreatment cases the clinicians access the pulp chamber as usual if there is an existing restoration if it is decided well-fitting and functional instead of disassembling. But coronal disassembly improves access, vision and retreatment efforts during the sessions, reduces chair-side time and increases the safety during the root canal negotiations and preparations. Following disassembling and re-accessing locating the skipped canals from the previous treatment attempts will be the essential for success and prognosis of the endodontic retreatment. Missed canals contains and enharbours microorganisms, necrotic tissues, bacteria and related biological irritants which cause the failure and infection. If the missed canal can be cleaned, shaped, disinfected and properly obturated 3D during the retreatment attempts the endodontic prognosis will be maximized by eliminating the biologic irritants, inflammation and infection. In this manner the root canal systems and the morphology must be known very well and also the experience is essential. Clear and properly angulated radiographs and advanced imaging techniques as dental micro ct, cone-beam techniques and high-technology resolutions of the views, magnification, lighting and operation microscope will increase the preciseness and ultrasonics with proper tips, sodium hypochloride, some solvents, EDTA and/or other gel form chelating agents will be very helpful with small size files.

Removal of obturation materials (i.e gutta-percha, carrier based obturators, silver points paste fillers) and posts are other challenging moments of endodontic retreatment. Rotary files, chemicals and solvents, ultrasonics, heat, hand-files, even laser use or their combination are used for removal of the previous obturation material. Solid material i.e silver points or posts can be removed with ultrasonics and their vibration or other mechanical techniques or in combination with other sets like "Post Removal Systems".

Separated instrument removal and intra-canal repairs are other crucial issues in endodontic retreatment and amongst the endodontic clinical applications. In many cases which require endodontic retreatment the separated instruments can be seen radiographically and many procedural errors clinically from the previous root canal treatment initiation. Perforations, zippings, ledges, elbows, apical transportations are seen many times during the endodontic retreatments from the previous root canal treatment, also blocks in the root canals are other restricting and limiting factors. Repair of perforations are necessary also the blocks and the blocking objects must be tried to open and/or passed through or removed as much as possible.

Straight-line access, pre-flaring, pre-curved smaller size files, using viscous chelators in the pulp chamber and canals are all helpful techniques to overcome the blockages and calcifications in the canals and pulp chamber. In spite of all efforts still the canals cannot be negotiated warm gutta-percha techniques can be recommended for the obturation of those canals.

Perforation must be managed properly. Perforation means a communication between inside and outside of the root to permit and a pathway for the pathological irritants. Perforations lead inflammation and ends up with infection which effects the prognosis of the tooth. A barrier technique which is generally MTA will be a smart way to repair the perforations. This barrier must be non-resorbable and rigid. Retreatment methodologies are various and require competency, clinical skills and experience and advanced training.

This opinion article summarizes the point of views in endodontic retreatment and a very brief outline about the challenges and solutions of the retreatment challenges related their management. The most important in retreatment is analyzing the case, etiology, possible future from the point of prognosis, potential risks and possible solutions during the retreatment.

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