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*Selected cases of periapical changes treated with calcium
hydroxide preparations*

The need for endodontic treatment has been increasing and is expected to increase in the future. It is related to the continuous prolongation of average duration of life recognition of health problems and tendency to prolong the efficiency of natural teeth (9). Therefore, endodontic treatment as a branch of stomatology is reviving not only in Poland but also all over the world (1, 2, 3). The choice of suitable methods of treatment of prolonged chronic *periodontitis* is an actual problem for doctor of stomatology.

On the basis of own experience and that of other clinicists it has been demonstrated that the use of not-hardening preparations based on calcium hydroxide applied for temporary filling of the root canals permits the *periodontitis chronic apicalis*.

Calcium hydroxide preparations were applied for the first time in 1920 by H e r m a n (4, 11) for the coverage of the tooth pulp. Calcium hydroxide exhibits prolonged bactericidal activity and owing to high pH value it can neutralise the acidic inflammatory reaction and increase the rate of regeneration of the bone. Ca⁺⁺ ions decrease the permeability of blood vessels, reduce the exudate pus and immunological reaction (4, 8, 11).

The objective of our investigations was the validation of the efficiency of treatment of infected root canals with periapical changes after application of calcium hydroxide preparations.

MATERIAL AND METHODS

The cases represented were chosen from a group of patients directed to the Clinic and qualified for surgical treatment – resection of the root apex owing to periapical chronic changes.

Our action consisted in routine chemo-mechanic treatment of the root canals and their temporary filling with the Biopulp preparation (6, 7).

In the case of patients with diagnosis *periodontitis apicalis chronica exacerbata* in the first stages of treatment the root canals were filled with a mixture of Biopulp and Dexadent to eliminate the pain and exudate pus. After termination of the acute state of the ailment the canals were fully elaborated, filled with Biopulp alone and tightly closed with glass-ionomer cement. The calcium hydroxide was exchanged every three weeks.

CASE 1

Patient D. M., male, aged 29, complained of tooth 46, increasing with occlusion clinical investigation revealed large amalgamate filling, 1st degree mobility, marked sensitivity of the tooth on

touching, positive pain reaction on vertical percussion. X-ray investigation (Fig. 1 a) revealed translucency reacting one third of the medial root apex of irregular shape.

After removal of the filling and elaboration of the root canals, the latter were filled with a mixture of Biopulp and Dexadent and the tooth disconnected from occlusion. On 8th day of treatment after cessation of acute symptoms the canals were filled with calcium hydroxide preparation and tightly closed with glass-ionomeric cement. Biopulp was exchanged in the canals every 3 weeks, control radiologic investigations were made after 3 months (Fig. 1 b) and 6 months (Fig. 1 c).

The radiograms show gradual disappearance of pathologic changes which were replaced by regenerated alveolar appendix bone. After six months of treatment the canals were finally filled with gutta-percha fillings with AH 26 paste. After 9 months since the beginning of the treatment the control radiogram (Fig. 1 d) shows trabeculae bone, regeneration of the periodontium around the apex of the medial root which can be considered as complete healing of the periapical pathosis.

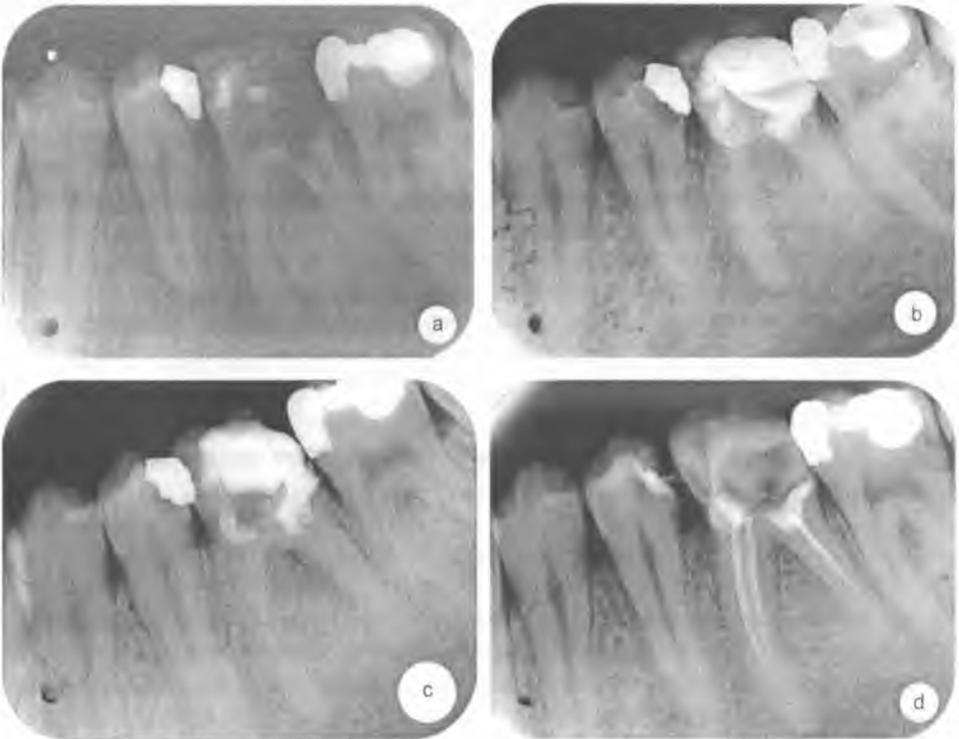


Fig. 1. Patient D. M., male, age 29. Diagnosis: *periodontitis periapicalis chronica exacerbata*, tooth 46, radiograms: a – before treatment; b – after 3 months, c – after 6 months; d – after 9 months of treatment

CASE 2

Patient J. D., male, age 31, directed for endodontic treatment of tooth 22 before the planned resection of root apex due to diagnosis of *periodontitis apicalis chronica exacerbata*.

Clinical investigation indicated sensitivity of the tooth on touching, positive reaction to occlusion. Radiological investigations (Fig. 2 a) have shown translucent areas of irregular shape to almost a half of the height of the tooth root, reaching to the root of tooth 21.

After opening the chamber, gangrene of pulp was found; the gangrenous mass was removed, the canal elaborated completely, filled with Biopulp and tightly closed with glass-ionomeric cement. The calcium hydroxide material was exchanged every 3 weeks. After a month the control radiogram indicated regeneration of trabecular bone around the root apex (Fig. 2 b). After 3 months the canal was filled with gutta-percha with calcium hydroxide tightened and control X-ray made (Fig. 2 c), which shows complete regeneration of the bone and healing periapical pathosis. In effect of the treatment the patient avoided surgical treatment.

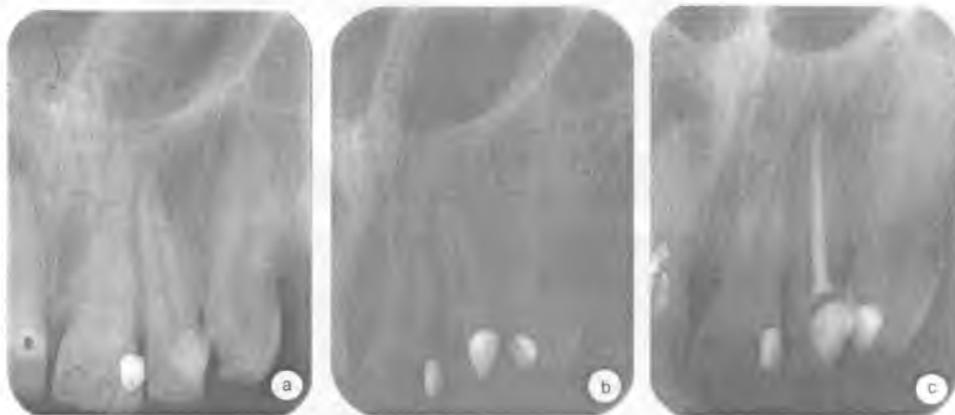


Fig. 2. Patient J. D., male, age 31. Diagnosis: *periodontitis apicalis chronica exacerbata*, tooth 22; radiograms: a – before treatment; b – after 1 month; c – after 3 months of treatment

CASE 3

Patient T. W., female, age 42, directed to the Clinic for preparation of tooth 22 for resection of the root apex with diagnosis of *periodontitis apicalis chronica exacerbata*.

Clinical investigation found insignificant swelling in oral cavity auricle in the proximity of the root apex of tooth 22, 1st degree mobility of the tooth and positive symptom on vertical percussion. The X-ray picture (Fig. 3 a) indicated large translucent areas around the root apex of tooth 22 between the roots of teeth 21 and 23 reaching one third of the root length.

Opening of the chamber revealed gangrene of the pulp; the gangrened mass was removed, the pus exude evacuated the canal partly elaborated and the tooth, left open for 24 hours. During the next visit the canal was completely mechanically-chemically elaborated and filled temporarily with paste composed of Biopulp and Dexadent for the period of one week, then the canal was elaborated again, filled with Biopulp and tightly closed with glass-ionomeric cement. The biologic dressings were exchanged every 3 weeks. After 3 and 6 months radiological investigations (Fig. 3b, 3 c) indicated gradual healing of periapical changes. The treatment of tooth lasted 9 months, then the canal was filled with gutta-percha with addition of calcium hydroxide. The control radiogram (Fig. 3 d) indicated full regeneration of the bone around the root of tooth 22, which was interpreted as complete recovery, thus the patient avoided surgical operation.

Summing up, the experience in our Clinic illustrated by some chosen cases as well as results reported by other authors indicate that conservative treatment of periapical changes with application of calcium hydroxide preparations is frequently successful and results in positive effects of conservative therapy. Conservative treatment of teeth is thus in high demand owing to a tendency to prolongation of the efficiency of natural teeth. Good results of treatment permit the elimination or reduction of surgical treatment which are alternative for healing of periapical pathosis.

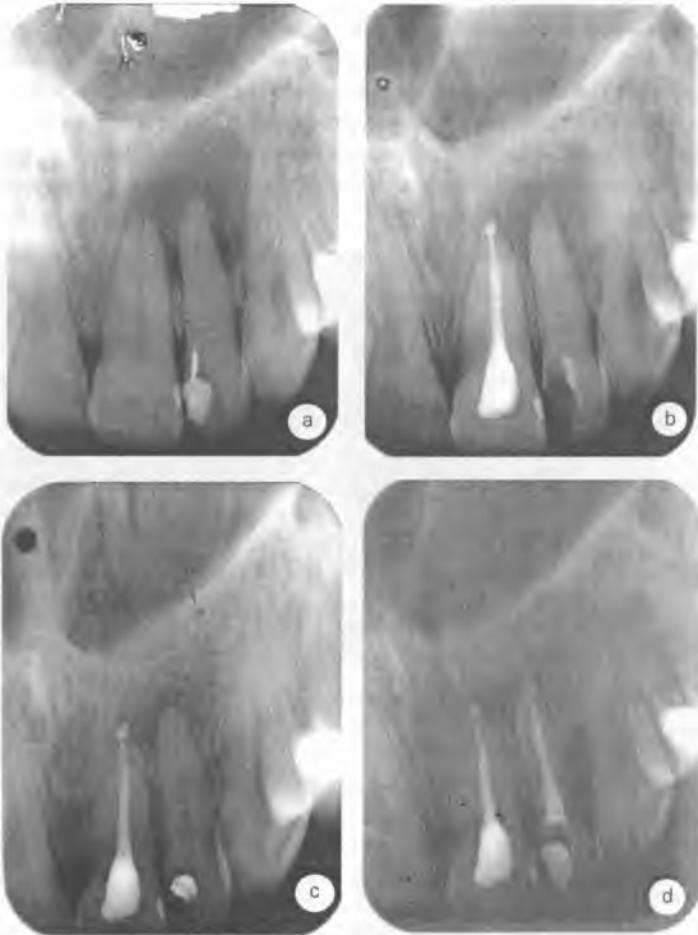


Fig. 3. Patient T. W., female, age 42. Diagnosis: *periodontitis apicalis chronica exacerbata*, tooth 22; radiograms: a – before treatment; b – after 3 months; c – after 6 months; d – after 9 months of treatment

CONCLUSIONS

1. Endodontic treatment with utilisation of therapeutic properties of calcium hydroxide preparations makes it possible to heal periapical pathosis.
2. Successful conservative treatment of periapical pathosis may eliminate or limit surgical treatment.

REFERENCES

1. Glickman G. N., Kooch K. A.: 21-st century endodontics. JADA, Vol. 131, June 2000.
2. Gutmann J. K.: Global warming up – a good thing for endodontics. J. Endodont., 26, 12, 767, 2000.

3. Gutmann J. K.: Knowledge and advocacy – the Keys to strengthening endodontics for the future. *J. Endodont.*, 27, 2, 135, 2001 (news).
4. Kindler R. P.: Historia wodorotlenku wapniowego w stomatologii, *Stom. Współ.*, 4, 294, 1994.
5. Knychalska-Karwan Z., Żuchowski J.: Zastosowanie wodorotlenku wapnia w stomatologii zachowawczej. Obserwacja preparatu Calasept. *Stom. Klin.*, XV, 169, 1994.
6. Krupiński J.: Metody i zasady leczenia endodontycznego. Leczenie endodontyczne na jednej wizycie (I). *Por. Stomat.*, 5, 8, 2002.
7. Krupiński J.: Metody i zasady leczenia endodontycznego. Leczenie endodontyczne na jednej wizycie. Zasady ogólne (II). *Por. Stomat.*, 6, 9, 2002.
8. Limanowska H. et al.: Ocena przydatności preparatu Biopulp w leczeniu zakażonych kanałów korzeniowych. *Czas. Stomat.*, XXXVII, 12, 953, 1984.
9. Löst C. et al.: Leczenie kanałowe jako część sanacji jamy ustnej. *Quintessence*, IV, 1, 15, 1996.
10. Łaszkiwicz J. et al.: Ocena możliwości leczenia zachowawczego dużych zmian okołowierzchołkowych na podstawie doświadczeń własnych. *Czas. Stomat.*, LI, 3, 167, 1998.
11. Wędrychowicz-Welman A., Lewandowski P.: Wybrane przypadki leczenia dużych zmian okołowierzchołkowych z zastosowaniem preparatów na bazie wodorotlenku wapnia. *Czas. Stomat.*, LII, 6, 366, 1999.

SUMMARY

Success in endodontic treatment with application of non-hardening calcium hydroxide preparations to periapical pathosis has been described. The clinical procedures consisted in elaboration of root canals and temporary filling with Biopulp preparation. Control clinical and radiological investigations were carried out after 3 and 6 months. In spite of occurrence of initial periapical pathosis, the method of treatment with calcium hydroxide preparations permitted to achieve positive results of healing of periapical pathosis thus eliminating the necessity of surgical operation.

Wybrane przypadki leczenia zmian okołowierzchołkowych preparatami wodorotlenku wapnia

W pracy przedstawiono skuteczność leczenia endodontycznego z zastosowaniem nietwardniejących preparatów wodorotlenkowo-wapniowych w leczeniu zmian okołowierzchołkowych. Postępowanie kliniczne polegało na opracowaniu kanałów korzeniowych i wypełnieniu ich czasowo preparatem Biopulp. Kontrolne badania kliniczne i radiologiczne wykonywano co 3 i 6 miesięcy. Pomimo obecności pierwotnych zmian okołowierzchołkowych zastosowana metoda leczenia z wykorzystaniem preparatów wodorotlenku wapnia pozwoliła na uzyskanie pozytywnych wyników leczenia zmian okołowierzchołkowych, eliminując tym samym konieczność leczenia chirurgicznego.