MEDICAL SCIENCES

INDICATIONS FOR PULP REMOVAL BEFORE PROSTHETICS WITH METAL-CERAMIC CONSTRUCTIONS

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Abstract
In recent years, metal-ceramic constructions have become the primary choice for prosthetics in cases of partial tooth loss and crown defects, as they allow for the optimal reproduction of the anatomical shape of teeth, fully restore masticatory function, and meet the increasing aesthetic demands of patients, achieving a functional-aesthetic optimum.

Keywords: preparation for metal ceramics, depulpation for orthopedic indications

Tooth preparation for metal-ceramic constructions involves grinding the tooth tissues to a thickness of 2 mm, which may adversely affect the condition of the tooth pulp. To avoid complications, it is essential to strictly follow preparation protocols for tooth hard tissues, understand safety zones, and be proficient in local anesthesia techniques. One of the key requirements is also taking measures to protect the prepared tooth from temperature and chemical impacts, as well as from infection penetrating through open dentinal tubules. All of this requires the dentist to have high qualifications, extra time, high-tech equipment, and modern materials.

In some cases, as part of the special therapeutic preparation of teeth, pulp removal may be necessary before prosthetics. The indications for this preparation have long been formulated and defined. According to various authors [1, 3, 5, 7], therapeutic preparation in the form of pulp removal is a last resort, and it should be considered in the following cases:

- If radiologically, a wide cavity in the tooth is determined, and during preparation, the tooth may be perforated, or after preparation, only a thin layer of dentin remains that cannot protect the pulp;
- In cases of tooth-alveolar elongation or protrusion >5 mm;
- In cases of tooth malposition, tilting >15°, rotations of upper central incisors >30° and lateral incisors >50°;
- In patients with periodontitis, when splinting of the anterior teeth is performed, and a decision is made to significantly shorten the crowns of the teeth;
- In cases of pathological wear of teeth of II and III degree;
- If persistent hypersensitivity occurs after preparation, which does not resolve after conservative treatment;
- In cases of significant destruction of the crowns of natural supporting teeth, when the decision is made to restore them with post-and-core inlays [1, 3, 5, 7].

According to the literature [2, 4, 6] and our own observations, despite strict indications for pulp removal before metal-ceramic crown prosthetics, in orthopedic practice, most intact supporting teeth are depulped before prosthetics to reduce the risk of complications and to facilitate preparation. Unjustified pulp removal – the deprivation of organ vitality – cannot be considered justifiable either ethically or legally.

Aim of the study: To determine the prevalence and justification of pulp removal during therapeutic preparation before metal-ceramic crown prosthetics.

Material and Methods: A retrospective analysis of outpatient records from several dental clinics of various ownership forms was performed. A total of 873 outpatient records of patients who underwent prosthetics with metal-ceramic crowns and bridge prostheses were analyzed. The analysis protocol of medical histories included the following points:

1. Diagnosis.
2. Total number of teeth used as supports for metal-ceramic crowns and prostheses (previously depulped and intact).
3. Number of teeth subjected to endodontic revision (from previously depulped teeth), reasons for pulp removal.
4. Number of teeth with satisfactorily sealed root canals.
5. Number of intact teeth intended for prosthetics and pulp removal as directed by prosthodontists.
6. Justification for referral for pulp removal (presence of indications).
7. Number of teeth depulped by therapists upon referral from prosthodontists.

Results and Discussion

Analysis of the first point showed that out of 873 patients, the diagnosis of partial tooth loss was made in

267 (30.58%); the diagnosis of "crown defect" was recorded in 141 (16.15%) medical histories; the combination of both diagnoses was present in 465 (53.27%) medical histories.

According to the second point of the protocol, 3174 teeth were used as supports for metal-ceramic constructions, of which 1539 (48.53%) had been previously depulped and 1635 (51.47%) were intact.

Determining the number of teeth subjected to endodontic revision (from previously depulped teeth), we found that out of 1539 previously depulped teeth, 606 (39.38%) underwent endodontic revision; thus, the number of properly filled teeth amounted to 933 (60.62%). Repeated endodontic treatment was performed on 606 (39.38%) teeth, including due to inflammatory changes in the periapical tissues for 225 (14.62%) cases, and due to poor root canal filling for 381 (24.76%) cases.

The number of intact teeth subject to prosthetics and pulp removal as directed by prosthodontists was 1377 (84.22%) of the total number of intact teeth, 1635. In 1371 (83.85%) cases, the reason for referral for pulp removal in the outpatient records was listed as "for orthopedic indications." In 6 (0.37%) cases, the reason for referral for pulp removal was changes in the periapical tissues seen on X-rays.

When investigating the reasons for referral for pulp removal in cases where the outpatient card recorded "for orthopedic indications," no grounds for pulp removal were found either in the "objective examination" section or in the diagnosis. Of the 1635 teeth, 264 (15.78%) were prosthetically restored with metal-ceramic crowns while maintaining pulp vitality.

From the outpatient medical records, it was evident that dental therapists consistently depulped intact teeth in 100% of cases after referral from prosthodontists.

Analysis of 873 medical histories showed that out of 3174 teeth used as supports for metal-ceramic prostheses, 1635 (51.47%) originally had a vital pulp. Of these 1635 intact teeth, 1377 (84.22%) were referred for pulp removal. The indications for pulp removal in outpatient records were changes in the periapical tissues detected on diagnostic X-rays in 0.37% of cases. The remaining 1371 (83.85%) teeth were depulped "for orthopedic indications." Metal-ceramic crowns were placed on 264 teeth (15.78%) out of 1635 originally intact teeth, preserving pulp vitality.

In none of the cases where teeth were referred for pulp removal "for orthopedic indications" was there any objective basis for such special preparation before prosthetics.

Thus, our study revealed a significant expansion of indications for pulp removal before metal-ceramic crown prosthetics, and in the overwhelming majority of cases, it was absolutely unjustified. From a legal standpoint, such a type of special preparation of teeth before prosthetics is, in most cases, unlawful.

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