Clinical observations concerning the role of dental crowding among the local etiopathogenical factors of periodontal disease-Case report

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Summary

Dental crowding is a high prevalence malocclusion among the young adult population. It has multiple negative consequences to the dento-maxillary system, influencing also the periodontal condition. In the case of the patient presented below, chosen from many cases examined, it is a direct connection between the degree of periodontal involvement and the localization of dental crowding. Treatment of crowding will lead to an improvement of the periodontal status. The conclusion supports the idea that dento-alveolar incongruence with crowding contributes and aggravates the periodontal destruction and the orthodontic treatment is a need of these patients.

Keywords: dental crowding, malocclusion, periodontal disease.

Introduction

The dento-alveolar incongruence with crowding is a frequently seen malocclusion among the population, with a various etiology [1]. The morpho-functional, masticator and physiognomic implications lead to a poor prognosis. Therefore it requires a correct treatment at the moment of diagnosis.

The dento-alveolar incongruence with crowding is known in the literature also as “dento-maxillary disharmony” (Cauhepe), “class I malocclusion” (Angle), “large teeth on small jaws” (Korkhaus), or “dento-alveolar incongruence with crowding” (Firu) [2].

The present work is motivated by the following observations:

1. Dental crowding has great negative influences on the dento-maxillary system. Besides the esthetic problem, which is the main factor motivating the patient to ask for dental treatment, there are other functional consequences, which can constitute favorizing factors for the onset and evolution of periodontal disease [3]. According to Proffit (1993) 10% of the orthodontically treated patients are motivated by periodontal problems. Therefore, patients with periodontal involvement and dental crowding should receive orthodontic alignment, considering also the high prevalence of periodontal disease in the adult population [4].

2. The effects of anterior or posterior dental crowding on the marginal periodontium include [5]:

- Plaque retention and the difficulty in maintaining a good oral hygiene;
- Pathologic changes in gingival contour, interdental bone and facial-lingual alveolar margin;
- Periodontal therapy (scaling, root planning, regenerative surgery) is more difficult to be performed in areas of crowding.

3. Orthodontic adjustment of crowding has many esthetic and functional benefits and also will facilitate the maintenance of good oral hygiene, which is the key point in

the prevention and successful treatment of the periodontal disease [6,7].

The purpose of the work is to show the consequences of dental crowding on the periodontal status. The examination of the periodontal status of patients with crowding included many patients, which presented in both Periodontology Clinics – Constanta and Bucharest.
Based on clinical examinations and recording of data we intend to make an epidemiological study of the prevalence of periodontal disease in patients suffering from dento-alveolar incongruence with crowding. For this presentation we have chosen from the cases examined an adult male, systemically healthy, showing good education concerning the individual methods of plaque removal and good life and work conditions (in order to eliminate as much as possible from the favorizing factors of the periodontal disease). The clinical examination has shown a difference regarding the degree of gingival inflammation and periodontal destruction between the crowded areas and non-crowded ones. A more accentuated gingival inflammation and periodontal destruction were associated with crowded areas.

Method

The patient was examined according to the periodontal chart, insisting on the periodontal exam and the correlation between malocclusion and periodontal destruction.

The examination of the superficial periodontium includes:

- Examination of the interdental papilla, free gingiva and attached gingiva. The level of epithelial attachment is also assessed. Palpation is done with the periodontal probe.

- Gingival recession is measured in millimeters, facially and orally.

- Assessment of the degree of gingival inflammation using Papilla Bleeding Index of Muhlemann. The reason of choosing this index is that in case of patients with crowding the interdental papillae located in areas of incongruence are the most affected; therefore the degree of papillary inflammation in these areas will reveal more accurately the health status at this level.

The examination of profound periodontium includes:

- The existence and depth of pockets, assessed with periodontal probes. The probe is inserted parallel with the long axis of the tooth and is gently moved around the tooth on all four surfaces. [8]

- The actual level of epithelial attachment and consequently loss of attachment;

- Examination of pathologic tooth mobility, drifting of teeth and furcation involvement, if present.

Case report

Patient ME, 38 years old came for dental treatment complaining also about gingival bleeding provoked by morning toothbrushing.

The patient reports that his mother has periodontal problems, loosing until present a big part of her teeth. The patient has no general disease that could influence the oral health status, except smocking.

Intraoral examination

Examination of the lower arch reveals a severe dental crowding involving the frontals (*Figure 1*) with teeth 31 and 42 located in linguo-position, 41 facially located with mesio-facial rotation and 32 disto-lingually rotated (*Figure 2*). The existence of this dento-alveolar incongruence with crowding in lower frontal area makes the artificial and self-cleaning difficult, favorizing plaque accumulation. The orally-inclinated teeth are more difficult to be cleaned,

Figure 1

Initial clinical aspect

Figure 2

The aspect of frontal crowding

showing plaque and calculus deposits on 2/3 of their height (*Figure 2*).

A global plaque and calculus evaluation shows a score 2 for the plaque index and 1.7 for the calculus index which means *a 3.7 score for the oral hygiene*, an unsatisfactory score.

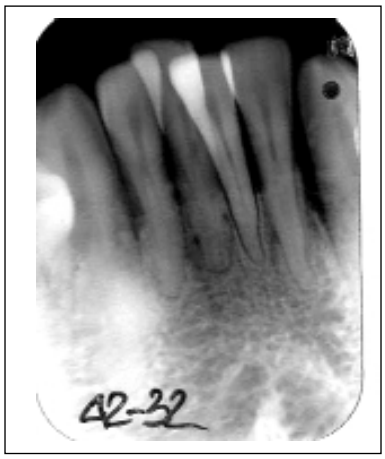
The examination of the superficial periodontium shows generalized gingival inflammation with a more severe involvement in the lower frontal area. The gingiva is enlarged, bluish-red in color, with rounded papilla, which covers more than the interdental embrasures.

Gingiva bleeds easily on probing, with a PBI score 3 for the lower region and 2 for the rest of the arch.

Periodontal probing shows the existence of true periodontal pockets with depth ranging between 3 and 7 mm, deeper in lower frontals – tooth 31 (6 mm facially and 7 mm mesially), tooth 32 (5 mm distally and 6 mm mesio-facially), tooth 41 (5 mm), tooth 42 (5 mm mesially, 4 mm distally). In other regions the loss of epithelial attachment is 3 mm or less.

Teeth are not mobile, except 31, which has first degree of mobility.

Figure 3.



Radiological aspect

Gingival recession is present, affecting especially the lower crowded frontals: on tooth 32 being 1 mm facially and 2 mm orally, on 31 – 2 mm facially and 3 mm orally, on 41 – 3 mm facially and 2 mm orally, on 42 – 2 mm orally. Lower right molars also exhibit recession of 1-2 mm on the oral surface.

The radiological examination of the lower frontal area (*Figure 3*) shows vertical bone loss and thin aspect of the interdental septa due mostly to dental crowding.

Diagnosis

Based on the afore-mentioned clinical and radiological signs, the patient has chronic marginal profound periodontitis, moderate stage in lower frontal area and early stage in the rest of the sites. Dento-alveolar abnormality with severe crowding of the lower frontals is also present.

Treatment

The patient follows the initial therapy including antimicrobial and anti-inflammatory therapy in order to remove the local irritating factors. The first evaluation, done one month after initial therapy, shows reduction of the gingival inflammation, the color of the gingiva changes more to pink with the disappearance of the stasis areas, reduction of the gingival enlargement and consequently of the depth of the true pockets, ranging from 2 to 5 mm.

Figure 4

Clinical aspect after alignment of frontals

Figure 5

Clinical aspect 2 years after finishing the orthodontic therapy

The patient agrees to also treat the incongruence and in collaboration with the orthodontist the lower left central incisor (which is in linguo-position and has important periodontal involvement) is extracted.

After finishing the orthodontic alignment of the lower frontals (*Figure 4*), a new re-evaluation of the periodontal status includes:

- The alignment of the lower frontals, without preservation of the midline continuity;

- Gingival inflammation still persists but is reduced in severity, with a PBI score 1.5 in the lower frontal area;

- Tooth 32 has a first degree of mobility due to the reduction in the epithelial attachment and also to the orthodontic movement in a bony area not completely healed after extraction of 31;

- The gingival recession in teeth 32 and 41 persists on both facial and lingual areas, being reduced in 32 at 1 mm facially and orally, in 41 at 2 mm facially and orally;

- The patient came to control 3 years after the end of the orthodontic alignment (*Figure 5*). Until this time, the patient came every year for recall, to remove calculus deposits if needed.

The level of oral hygiene is unsatisfactory, with plaque accumulation, showing a 1.8 index for plaque. The pathologic tooth

mobility is no longer present, despite the fact that the value of gingival recession in tooth 41 increased with 1 mm facially.

Results and discussion

Patient with chronic marginal profound periodontitis with dento-alveolar incongruence with severe crowding of the lower frontals is examined. The deepest pockets are located in the crowding area, as well as the gingival recession. One observation is that the severe dental crowding aggravates the periodontal involvement, and favorizes plaque accumulation and the persistence of gingival inflammation.

The patient follows antimicrobial anti-inflammatory treatment associated with orthodontic therapy, which consist in extraction of the orally-positioned central incisor and subsequent alignment of the frontals with closing of the space, thus solving the crowding problem.

The result consists in reduction of the degree of gingival inflammation and of the retentive interdental spaces inaccessible to artificial and self-cleaning. Immediately after removal of the orthodontic appliance the gingival recession persists and the left lateral incisor exhibits a first-degree mobility. This pathologic mobility is due to the periodontal disease and also to the recent orthodontic movement in an incomplete mineralized alveolar bone, secondary to extraction of 31.

A periodontal re-evaluation done 3 years after the end of the orthodontic alignment shows the persistence of periodontal pockets, without any pathologic tooth mobility or pathologic tooth migration. The gingival recession persists in frontal lower region.

Conclusions

The dental crowding has a negative influence on the periodontal structures from anatomical point of view (thin alveolar septa which are more subjected to demineralization, short and thin papilla with a more ischemic blood circulation), as well as from local viewpoint, favorizing plaque accumulation.

In the patients examined as well as in the clinical case presented a direct correlation is expressed between the severity of crowding and the gingival inflammation, which is more important in areas of malocclusion.

Orthodontic therapy has a positive influence by reducing the crowding areas and consequently the plaque retentive areas. The result consists in reduction of the gingival inflammation, which was not possible before teeth alignment. Tooth mobility also disappeared after orthodontic treatment.

In conclusion, orthodontics and periodontics are connected by the multiple benefits of both therapies on the oral and periodontal health.

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Spatiul rezultat este insuficient. Imi pare rau.

Va disparea dupa ce va trimit