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Dental Interventions on First Permanent Molars

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ABSTRACT

The first permanent molars have the biggest dental morbidity and mortality of all permanent teeth. The main aim was to evaluate of the most common dental problems and procedures that are performed on the first permanent molars. Material and method: examination was performed in three private dental offices, two from urban and one from rural region, over a period of 2 years. The data was obtained by using dental charts from the patients and by the ambulatory register for performed interventions. Total number of interventions of the remaining teeth was detected, which interventions are most performed and which of the four first permanent molars have the highest morbidity. on the first permanent molars were made 10.98% from the total number of interventions. 61.33 %of the subjects possessed all four first permanent molars. The left mandibular molar has the highest number of interventions performed from all first permanent molars. the most common reason for dental interventions on the first permanent molar is caries and its complications. In a very small number of subjects all first permanent molars were not affected by any disease. Removal of caries is the most common dental intervention on the first permanent molars.

Keywords: First molar, first permanent molar, interventions, tooth mortbidity, tooth mortality

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INTRODUCTION

The first permanent molars with its anatomical configuration (massive crown and powerful roots) and its position in the dental string is considered as the most important teeth in humans. The expressed relief structure of the occlusal surface of the first permanent molar usually occurs retention of food and the tooth often very early is destroyed by caries.[1] Caries is most common disease among humans today. And if the tooth is busy with cavities is mostly ignored by the patient and finally come to the dentist when there is severe pain. The first permanent molar is a tooth that possesses the greatest root surface making it the best option for the holder of various prosthetic devices.

From all this it may be noted that the first permanent molar is extremely important and functional and developmental sense. Rapidprogresive caries on permanent molars, lead to its destruction caries which is often extensive. So very early, even in the adolescent period there is a need for endodontic treatment on it. Knowing the numerous deficiencies on the one hand, and the numerous anomalies that may occur during endodontic therapy complicates even more the possibility for prolonged keeping the first permanent molar in the oral cavity. In some cases, although it is possible to conduct a proper endodontic therapy however, the patients themselves perform with demand for its extraction. Although in modern dentistry reasons for extraction are minimal, one of the earliest and most often extracted teeth in the human mouth is the first permanent molar.

The first permanent molar tooth emerges as the first permanent teeth, it is necessary to keep your mouth as long as possible. Therefore, all efforts undertaken by the dentist needs to focus on its conservative treatment, so it is very important to prevent tooth morbidity.

If oral hygiene and care for your teeth is so important factor for oral health, then validate and irregular visits to the dentist are the most common causes of caries destruction of the first permanent molar, which destroys deeper dental tissues and eventually inevitable loss.

The first molars make important role in determining the level of bite, the lower third dimension of the face and also play an important role in health and position of other permanent teeth. [2]

Localized attachment loss of the first permanent molars is very common among the elderly. Such a loss of attachment is connected to the massive presence of periodontitis among adults and is the result of the cumulative effect of periodontal disease over time. Localized attachment loss of molars is also associated with crown angulation, its inclination and with the position of the teeth in dental arch. [3]

The first permanent molars are the most common with dental morbidity, so they are usually the first to lose vitality of permanent teeth.

Right permanent mandibular molar is most prone to morphological deviations in overall percentage compared with other permanent teeth. It is especially important to note that the mandibular molars have higher incidence of these deviations in correlation with the maxillary. [4]

Morphology, time of the eruption, and the positioning of the tooth in the oral cavity brought certain advantages and disadvantages of various methods used to control plaque and occurrence of dental diseases and damages. On the other hand, in more developed countries, incidence for occurrence of dental caries and adequate of gingival health are evident. This decrease of the incidence of dental caries is mainly due to the appropriate use of fluoride, as well as other preventive measures for oral health. [5]

According Nishio and all [6] mesial surfaces of permanent molars are susceptible to develop cavities more than other surfaces of permanent teeth.

First permanent molars are most affected teeth by caries in deciduous and permanent dentition. Often carious teeth occur at the occlusal surfaces of first permanent molars [7] while most frequently affected are mandibular first molars. [8] The left mandibular first molar has the highest-caries prevalence in deciduous dentition versus right first molar that have highest caries prevalence in permanent teeth. [9]

With increasing age very few fissures of occlusal surfaces of first permanent molars remain intact. Caries dominant develops on occlusal surfaces in the deep fissures. Occlusal morphology should be taken into account when developing a strategy for the prevention of occlusal caries. [10]

Use of new hydrophilic fissure sealers, reduce sensitivity and reduce the impact of saliva on the prepared enamel during therapeutically procedure. Occlusal surfaces of first permanent molars are more suspectable for occurrence of carious lesions, and it also has lower fluoride absorption compared to other occlusal surfaces of teeth other teeth of the permanent dentition. [11]

The first permanent molar has biggest caries incidence of all remaining teeth of permanent dentition, from 40 to 60%. More than 50% of children over 11 years have some form of caries, whether it is superficialis, media or complicata. [12]

According to Cheng and all [13] among permanent teeth highest frequency of dental caries has the first permanent molars, and also the highest number of missing teeth is first permanent molars (67%). Second molars and second premolars have a second and third most common frequencies respectively, compared to the incisors and canine which are affected rarely (less than 2%).

Complications after extractions are very common especially after lower teeth extraction. The most common teeth associated with alveolitis are molars and premolars. Most commonly affected molars according Norohna and all [14] with such complications are first, followed by the third and finally the second molars.

In 95% of the population, all four molars are or have been affected by caries. [15] The prevalence of caries is greater among mandibular molars (47%) than in the maxillary first molar (25%) . 36% of all those molars were healthy, while among 11% of them all first permanent molars were affected by caries.[16] According to that what can be observed in the literature [12,13,17] , the first mandibular molar tooth is most often missing. Often the number of carious teeth is greater than the number of people with adequate filled teeth.

Despite the numerous studies by foreign expert and popular journals about the first permanent molar, here we are relatively deficient with articles about it.

Taking into consideration aforementioned facts about oral health, and the presence of numerous dental problems related to the first permanent molars the main aim was directed to make consideration of the most common dental problems and procedures that are performed on the first permanent molars.

MATERIAL AND METHODS

For the realization of the goals appropriate examination was performed in three private dental offices, two from urban and one from rural region. Presented data originates from research conducted over a period of 2 years, from 31 August 2013 to 31 August 2015.

The data was obtained by using dental charts from the patient and by the ambulatory register for performed interventions. While the investigation we were outlining all interventions performed on the first permanent molars.

During the research an analysis of the percentage of completed interventions performed on the first molar in correlation with total number of interventions of the remaining teeth was made. Also was noted which interventions are most performed on the first permanent molar (whether it was cured conservatively or extracted). Also was looking for which of the four first permanent molars is highest morbidity.

Data were aggregated, while the values are presented in accordance with the recommendations of the World Health Organization expressed by numerical values expressed values to two decimal places. Results of the survey were processed in two ways manually and using specialized computer software-Statistical 9 for Windows and Microsoft Excel 2012.

The processed data are presented in tables and graphs using as needed. The results obtained in the test population are represented in percentage.

RESULTS AND DISCUSSION

The average age of the persons who have dental interventions on the first permanent molars was 41,37 ± 12,25 years (range 07-76 years Confidence interval from 12,94 to 62.86 years). Male respondents among the subjects were more numerous compared to females (62% vs. 38%).

From the whole number of interventions in the examined period performed total number of 6945 interventions of which 763 were made the first permanent molars. This means that in the investigated period on the first permanent molars were made 10.98% interventions from the total number of interventions. (Figure 1.)

From the total number of subjects, 61.33 % possessed all four first permanent molars, three of the first molars were observed in 24.29% of subjects, two of the first permanent molars in 10.22% of subjects and only one of the first permanent molar was present among 4.16 % from the subjects. (Figure 2.). In only 2.14% from the subjects all four first permanent molars were completely healthy.

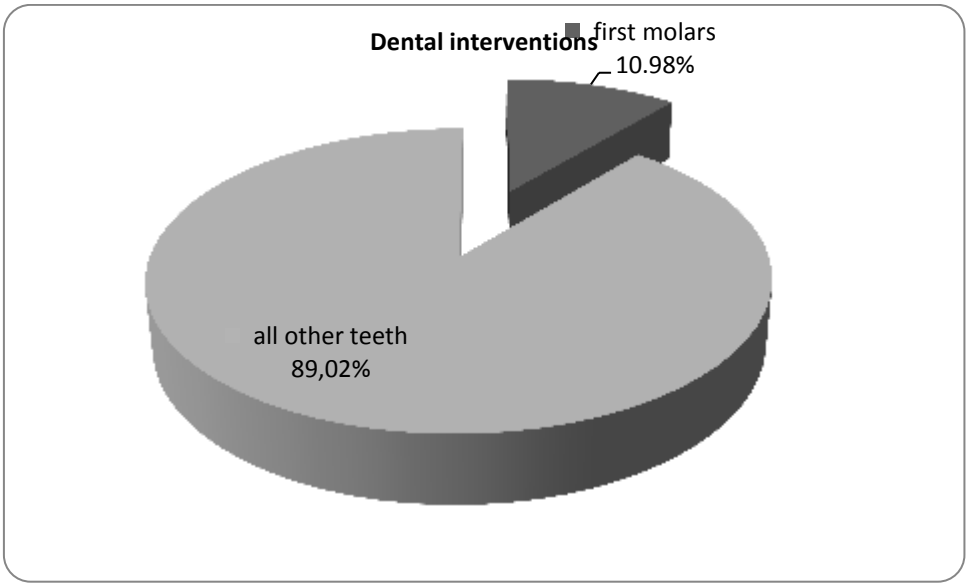

Figure 1: Percentage of dental interventions made on first permanent molar among the subjects

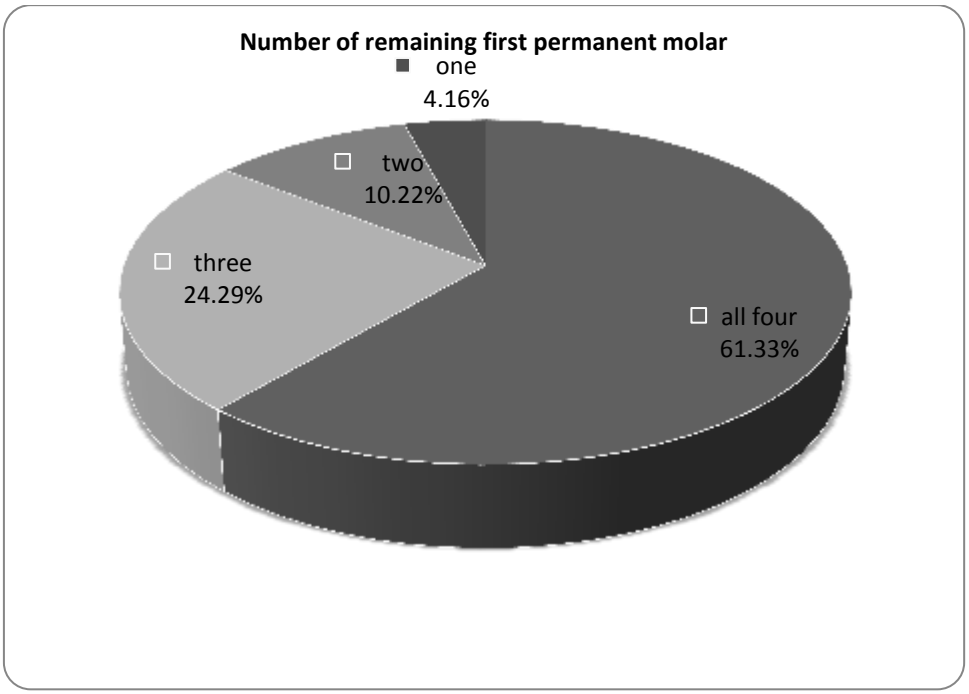

Figure 2: Number of remaining first permanent molar among the subjects

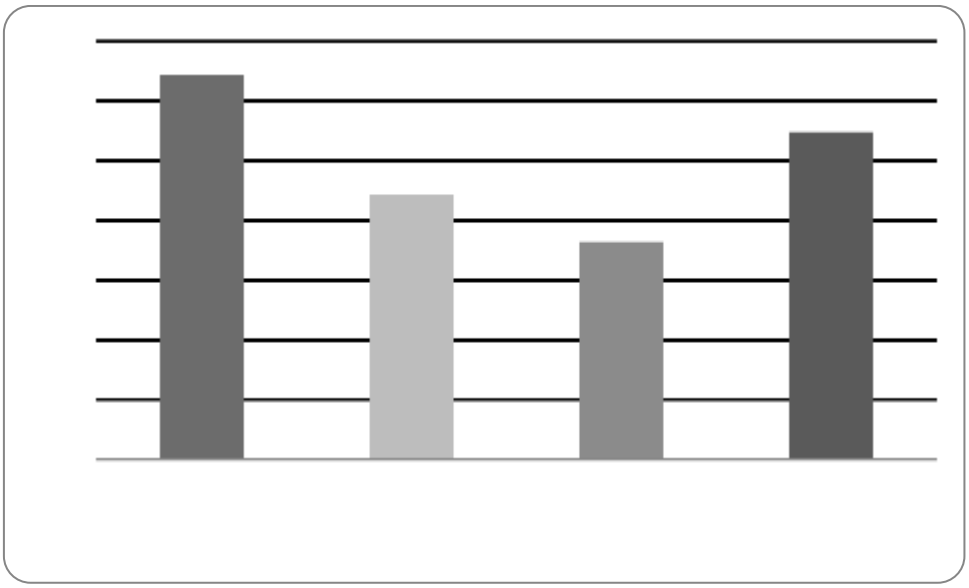

Figure 3. Graficaly presenation that shows on which molar are performed the most inteventions

From the total number of interventions performed the first permanent molars, according to the processed data can be observed that they are carried out on (Figure 3).

- On the left mandibular first molar 33,21%
- On the right mandibular first molar 21.64%
- On the left maxillary first molar 17.16%
- On the right maxillary first molar 27.99%

According to the given results can be concluded that the left mandibular molar has the highest number of interventions performed from all first permanent molars.

After statistical analysis we noted that the average age of patients where was performed any dental intervention, whereas it was of restoration, endodontic or surgical type was 18,43 ± 19,13 years (range 07-72 years Confidence interval from 16.34 to 69.17 years).

Results relating to interventions that are done on the first permanent molar in the period of 2 years from the data the following types of interventions were observed (Figure 4):

- Removal of caries and appropriate restoration with permanent fillings - 42.91%
- Endodontic treatment - 28.36%
- Extraction - 17.54%
- Fissure sealing - 11.19%

According to data from all intervention on the first permanent molars, next diseases and conditions can cause need for appropriate therapeutic intervention (Figure 5):

• Caries superficialis -11.57%
• Caries media - 33,21%
• Caries profunda - simplex / complicata - 10.07%
• Gangrena simplex - 3.36%
• Inflammatory conditions of pulp - 25.00%
• Luxacio dentis - 3.73%
• Fractura dentis - 0.75%
• Chronic periodontitis - 10.07%
• Failed endodontic treatment - 2.24%

From the figure 5. It can be noticed that the most common reason for dental interventions on the first permanent molar is caries, regardless of their advancement, and endodontic inflammatory processes caused by caries.

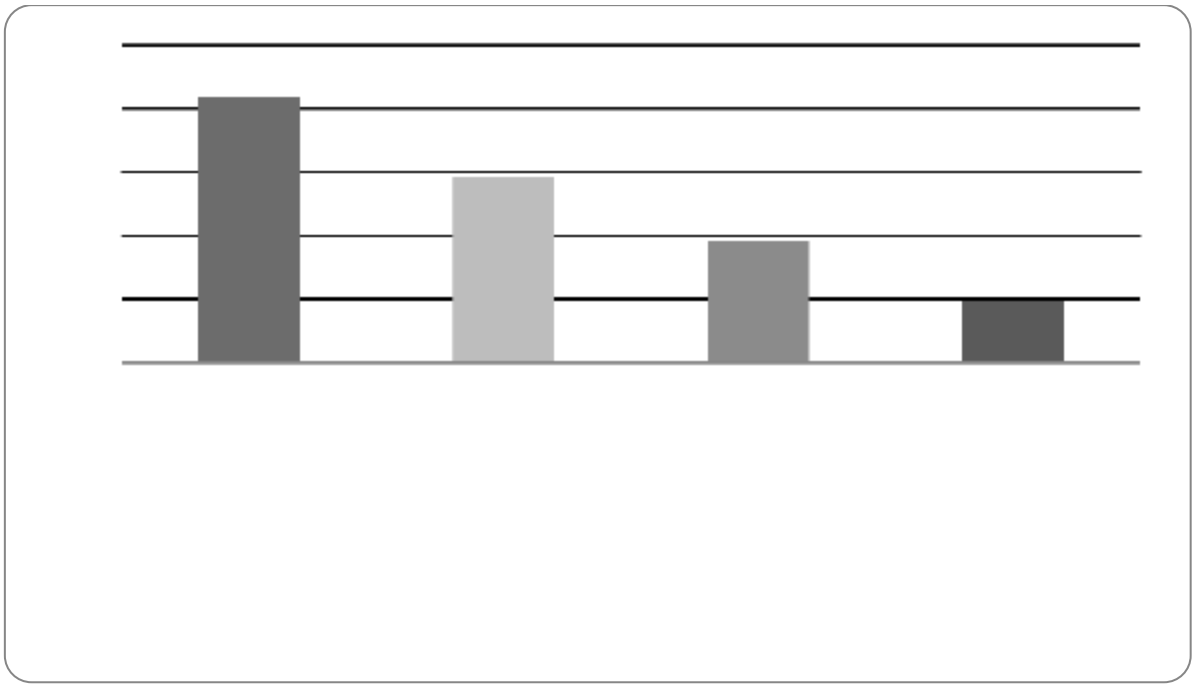

Figure 4. Types of interventions on the first permanent molars

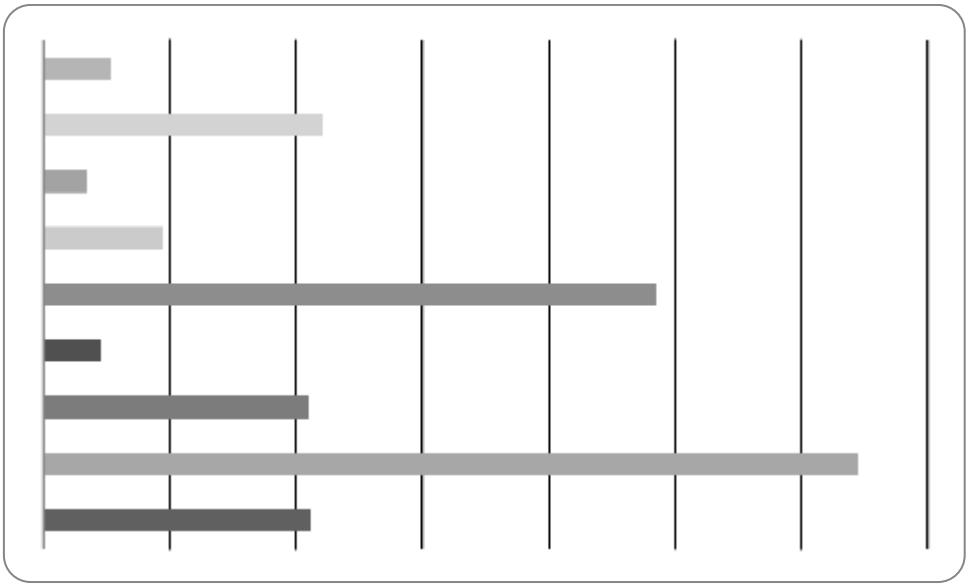

Figure 5. Most common causes that leads to intervention on first permanent molars

This study is focused to the most common dental problems and interventions that are performed in the first permanent molar. The survey was conducted in the period from 31 August 2013 to 31 August 2015, in period of two years. It is a cross-sectional study and the results presented in it are original and not published until now.

Limiting effect of this study is that randomization of participants was not performed. Also particularly important is that this examination is performed in only three dental offices. These two facts can impact on generalization of the data and conclusions, but data for the most common dental problems and interventions that are performed in the first permanent molar can be used. Thus with the help of this research can be seen the impact and longevity of taken

preventive measures and methods. From here these two limiting factors in this study does not mainly affect the validity of the results.

Socio-demographic, behavioral and biological risk factors are correlated with caries incidence. According Rossete Melo and all[18] 25.4% of caries lesions on occlusal caries occurs on occlusal surfaces on the first permanent molars. Dental caries on occlusal surfaces of first permanent molars is destined with a history of caries disease and the presence of dental plaque on teeth.

According to the results presented in this research can be seen that from the total number of interventions performed in the dentist's office, the number of it on the first permanent molars is 10.98% (Figure 1). Other similar data ranging in limits to ten percent are presented by Al-Samadani and all[5] and Legovic and all .[19]

According to our examination most of the subjects had all four first permanent molars in their mouth, but biggest concern is that 10,22% of subjects had two permanent molars present in their mouth and the 4,16 % missing three permanent first molars (Figure 2).

Because in our country preventive dentistry is on low stage, indicates the fact that the total number of persons who posses four first permanent molars which were completely healthy is only 2.04% from the subjects.

According Albadri and all [20] the main reason for the extraction of the first permanent molar was caries with poor prognosis (70%). Sixty-eight percent of the cases before it had done any treatment on the first permanent molars and only 5% had filled fissures. Forty percent of the children had previously made extraction.

The average age for extracting first permanent molars according to the processed data in our study was 38 years. The average age is quite low and suggests that among the young people extractions of these significant teeth is performed.

After processing the data it is noted that the most common dental intervention among subjects in 42.9% is in a removal of caries and appropriate restorative permanent solution, while the lowest percentage of interventions performed in 17.54% were extractions of first permanent molars. From the preventive activities dominant was sealing of the fissure of the first permanent molars in 11.19% of respondents. A similar ratio of interventions is presented by Al-Samadani and all [5] and Dukić and all [12] in contrast, and a contrary to our research Legovic and all [19] who shown that the dominant intervention is tooth extraction. This difference we believe is due to the fact that the respondents had different age structure.

According to the processed data it has been noted that the most common interventions are the same for female and male. In both sexes the most common intervention is dental caries

removal with subsequent placement of definitive restoration is performed while least extraction of the first permanent molars and in males and females equally.

From Fig. No. 5. it may be noted that the most common reason for dental interventions on the first permanent molar is caries processes, regardless of their advancement and endodontic inflammatory processes of decay. Since caries processes is divided by their progression, dominate was caries media in one-third of respondents (33,21%).

According to Legovic and all[19] first permanent molar is most affected by caries. Detecting of caries in its initials stage is of great importance in order to prevent the occurrence of carious cavity. According Mirska-Mietek [21] approximal surfaces of the mandibular first molars were most affected teeth with cavities. Increased prevalence of caries on approximal surfaces is considered to be correlated with poor oral hygiene.

Studies relating to the prevalence of caries among schoolchildren indicated that somewhere about 87% of children are affected first permanent molars caries, suggesting that the development of new carious lesion is usually localized on the first permanent molars. [14]

Carvalho [22] concluded that the first and second permanent molars are showing the greatest caries incidence. Evidence suggests that the most powerful biological factor for the occurrence of occlusal caries is large plaque accumulation. As a result, the active occlusal lesions were significantly more common in teeth eruption than in already transgressed teeth.

In their research Suni and all [23] among the younger population, showed very few teeth without cavities. On mandibular permanent molars can observed a higher incidence of teeth without caries.

According Halicoglu and all [24] mandibular first permanent molars are most common extracted teeth, and significantly more likely than permanent molars. Bigger prevalence for the extraction of the first permanent molars among Turkish adolescents and youth shows a need for guidance on the dental prevention and other dental treatments in order to reduce the number of extracted first permanent molars.

Orthodontic treatment performed by extraction of the first molars increases empty space required for the third molars.[25] Early loss of deciduous teeth can lead to distortions in the occlusion, so this is a reason for setting a guardian of space. Reduction in space is characterized by cusp dislocation and movement of remaining teeth to empty space. [26]

CONCLUSION

Based on the data and consistent analysis of the results we can notice that in males number of interventions of the first permanent molars is bigger. In a very small number of subjects all first permanent molars were not affected by any disease. Less than a quarter of the patients performed the extraction of the first permanent molar and the most common reason for

extraction of the first permanent molar is his luxation (which is thought to be a consequence of the present periodontitis). Removal of caries is the most common dental intervention on the first permanent molars. So e can conclude that the most common reason for interventions on first permanent molars were caries lesions, and the rarest are fractures and congenital malformations.

REFERENCES

1. Bajraktarova B. Trajna denticija, embriologija i anatomohistomorfologija, Laurens Koster, Skopje, 2000.
2. Gill DS, Lee RT., Tredwin CJ. Treatment Planning for the Loss of First Permanent Molars. Dent Update. 2001,28: 304-308
3. Volchansky A, Evans B, Cleaton-Jones P. Position and orientation of the maxillary first permanent molar and localized attachment loss.World J Orthod. 2004; 5(2):141-6.
4. Yousuf, W., Khan, M., & Mehdi, H. Endodontic Procedural Errors: Frequency, Type of Error, and the Most Frequently Treated Tooth. International Journal of Dentistry, 2015, 673914. http://doi.org/10.1155/2015/673914
5. Al-Samadani, K. H. M., & Ahmad, M. S. Prevalence of First Permanent Molar Caries in and Its Relationship to the Dental Knowledge of 9–12-Year Olds from Jeddah, Kingdom of Saudi Arabia. ISRN Dentistry,2012, 391068.
6. Nishio C, Jardim da Motta AF, Elias CN, Mucha JN. In vitro evaluation of frictional forces between archwires and ceramic brackets. Am J Orthod Dentofacial Orthop. 2004;125:56-64.
7. Chironga L, Manji F. Dental caries in 12-year-old urban and rural children in Zimbabwe. Community Dent Oral Epidemiol. 1989; 17(1):31-3
8. Addo-Yobo C, Williams SA, Curzon ME. Dental caries experience in Ghana among 12-year-oldurban and rural schoolchildren. Community Dent Health. 1991; 8(2):155-62.
9. Adeniyi AA, Agbaje O, Onigbinde O, Ashiwaju O, Ogunbanjo O, Orebanjo O, et al. Prevalence and pattern of dental caries among a sample of nigerian public primary school children.Oral Health Prev Dent. 2012;10(3):267-74.
10. Kondeva VK, Kukleva MT, Petrova SG, Mileva SP. () Dynamics of occlusal caries in permanent molars and premolars in children aged 7 to 14 years. Folia Med (Plovdiv). 2008; 50(3):58-64.

11. Eskandarian T, Baghi S, Alipoor A. Comparison of Clinical Success of Applying a Kind of Fissure Sealant on the Lower Permanent Molar Teeth in Dry and Wet Conditions. Journal of Dentistry. 2015;16(3):162-168.
12. Dukić, W., Delija, B., Lulić -Dukić, O. Caries prevalence among schoolchildren in Zagreb, Croatia. Croatian Medical Journal. 2011; 52(6): 665–671.
13. Cheng RB, Tao W, Zhang Y, Cheng M, Li Y. Analysis of the first permanent molar caries epidemiological investigation in area of northeast China. West China Journal of Stomatology. 2008; 26: 73-6.
14. Noronha JC, Massara Mde L, Souki BQ, Nogueira AP. First permanent molar: first indicator of dental caries activity in initial mixed dentition. Braz Dent J. 1999; 10: 99-104
15. Machiulskiene V, Nyvad B, Baelum V. Prevalence and severity of dental caries in 12-year-old children in Kaunas, Lithuania 1995. Caries Res.1998; 32(3):175-80.
16. Warnakulasuriya S. Caries susceptibility of firstpermanent molars and treatment needs in Sri Lankan children, aged 13-16 years, in 1986. Community Dent Health. 1991; 8(2):167-72
17. Jaafar N, Nor GM. The prevalence of post-extraction complications in an outpatient dental clinic in Kuala Lumpur Malaysia--a retrospective survey. Singapore Dent J.2000;23(1):24-8.
18. Rossete Melo R, Rezende JS, Gomes VE, Ferreira E Ferreira E, Oliveira AC. Sociodemographic, biological and behavioural risk factors associated with incidence of dental caries in schoolchildren's first permanent molars: a 3-year follow-up study. Eur J Paediatr Dent. 2013 Mar;14(1):8-12.
19. Legovic I., Kotarac-Knezevic A., Sabov T., Brumini G., Sasso A., Kovac Z., et all (2010) Health Condition of First Permanent Molars in Year 1977 and 2007 in Children in Istria (Croatia) Coll. Antropol. 2010 34(3): 1035–1038
20. Albadri S, Zaitoun H, McDonnell ST, Davidson LE. Extraction of first permanent molar teeth: results from three dental hospitals. Br Dent J. 2007; 203(7):E14; discussion 408-9. Epub 2007 Jul 27.
21. Mirska-Mietek M. Diagnosis of caries on approximal surfaces of permanent teeth. Ann Acad Med Stetin. 2010;56(2):70-9.
22. Carvalho J.C. Caries Process on Occlusal Surfaces: Evolving Evidence and Understanding. Caries Res. 2014;48:339-346

23. Suni J. Vähänikkilä H. Päkkilä J. Tjäderhane L. Larmas M. Review of 36,537 Patient Records for Tooth Health and Longevity of Dental Restorations Caries Res 2013;47:309–317
24. Halicioglu K., Toptas O, Akkas I, Celikoglu M. Permanent first molar extraction in adolescents and young adults and its effect on the development of thirdmolar.Clin Oral Investig. 2014; 18(5):1489-94.
25. Bayram M, Ozer M, Arici S. Effects of first molar extraction on third molar angulation and eruption space. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009 Feb;107(2):e14-20.
26. Corraini P, Baelum V, Pannuti CM, Pustiglioni AN, Romito GA, Pustiglioni FE. (2009) Tooth loss prevalence and risk indicators in an isolated population of Brazil.Acta Odontol Scand. 2009; 67(5):297-303.