Journal of

CONTINUING DENTAL EDUCATION

UKRAINIAN PUBLIC SCIENTIFIC SOCIETY

Volume 1 • Issue 1 • October 2022

U D J

Ukrainian Dental Journal

УКРАЇНСЬКИЙ СТОМАТОЛОГІЧНИЙ ЖУРНАЛ

U D J
Ukrainian Dental Journal

Ukrainian Dental Journal
official Publication of the
Ukrainian Public Scientific Society for Continuing Dental Education

CONTINUING DENTAL EDUCATION
UKRAINIAN PUBLIC SCIENTIFIC SOCIETY

Founder and Publisher
Ukrainian Public Scientific Society "Continuing Dental Education"
Address: 15, Kyrylivska str., Kyiv, 04080, Ukraine
E-mail: editor.udj@gmail.com
Website: www.journal.dental.ua
Certificate of State Registration of Print Media
Series KB № 25041 - 14981P from 30.11.2021
Certificate of making a publishing house subject to the State Register of publishers, manufacturers and distributors of publishing products
Series ДК №7617 from 01.06.2022
Ukrainian Dental Journal (**p-ISSN** 2786-6297; **e-ISSN** 2786-6572) is official Journal of the Ukrainian Public Scientific Society for Continuing Dental Education
DOI: 10.56569
Published: from the year 2021
Frequency: semiannual (March, October)
Manuscript Languages: English, Ukrainian
Ukrainian Dental Journal accepts articles for Open Access publication
UDC: 616.314(477)(05)

UDJ was sent to the publisher on 05.09.2022
Printing format is 60 x 84/8
Offset color printing, coated glossy papers
Volume of 5 physical and 11.2 conventional printed sheets
It's edition of 100 copies circulation
Forms of Journal is produced by LLC PoygraphFactory, Kyiv, Ukraine

Засновник і Видавець
ГС "Безперервного професійного розвитку стоматологів"
Адреса: 04080, Україна, м. Київ, вул. Кирилівська, 15
Електронна адреса: editor.udj@gmail.com
Веб-сайт: www.journal.dental.ua
Свідоцтво про державну реєстрацію друкованого ЗМІ
Серія КВ № 25041 - 14981Р від 30.11.2021
Свідоцтво про внесення суб'єкта видавничої справи до Державного реєстру видавців, виготовлювачів і розповсюджувачів видавничої продукції
Серія ДК №7617 від 01.06.2022
Український стоматологічний журнал (**p-ISSN** 2786-6297; **e-ISSN** 2786-6572) є офіційним журналом Всеукраїнської Громадської Спілки "Безперервного професійного розвитку стоматологів"
DOI: 10.56569
Рік заснування: 2021
Періодичність: кожні півроку (березень, жовтень)
Мова видання: англійська, українська
«Український стоматологічний журнал» - міжнародне рецензоване фахове наукове видання відкритого доступу
УДК: 616.314(477)(05)

Підписане до друку 05.09.2022
Формат 60 х 84/8
Друк кольоровий офсетний. Папір крейдяний глянцевий
Обсяг 5 фізичних і 11,2 умовних друкованих аркушів
Наклад 100 примірників
Друк ТОВ Поліграфкомбінат, м. Київ, Україна

ISSN 2786-6297 (print) ISSN 2786-6572 (online)
Український стоматологічний журнал
УДК: 616.314-007.44(048.8)
DOI: 10.56569/UDJ.1.1.2022.37-42

U D J
Ukrainian Dental Journal

Treatment options for dens in dente: state-of-art literature review

Volodymyr Fedak [A, B, C, D, E, F]
DDS, Private Practice, Chernivtsi, Ukraine
ORCID ID: 0000-0001-6840-6945

Corresponding author. Volodymyr Fedak, Private Dental Clinic «Viva Dent», 8, Bilousova Street, Chernivtsi, Chernivtsi region, 58000 Ukraine
e-mail: fedakvova@gmail.com

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article

Article Info

Artical History:
Paper recieved 7 June 2022
Accepted 28 July 2022
Available online 1 October 2022

Keywords:
dens in dente,
invagination,
dens invaginatus,
treatment,
literature review

https://doi.org/10.56569/UDJ.1.1.2022.37-42

Abstract

Background. Dens in dente represents developmental anomaly of tooth structure, characterized with different depth of invagination lined with either enamel or cementum, and associated with different clinical and roentgenological features.

Objective. To methodize available treatment options for dens invaginatus in systematic manner and analyze suitability of such for different clinical scenarios.

Materials and Methods. Aggregation of data regarding treatment options for dens invaginatus cases was provided through literature search within Pubmed Central and PubMed databases. Literature review was provided in accordance to the available guidelines.

Results. Provided literature review helped to establish four main strategies of treating teeth with present dens invaginatus anomaly: 1) preventive treatment (with no endodontic intervention); 2) preventive treatment (with endodontic intervention only in invaginated canal); 3) treatment of dens invaginatus-associated complications (with endodontic treatment of original and invaginated canals); 4) complex treatment of dens invaginatus-associated complications, which includes not only root canal treatment, but also periodontal treatment and other potential treatment options, such as extraction.

Conclusion. Dens invaginatus represents several clinical challenges during the treatment related with type of structural anomaly due to the Oehlers classification, variability of its configuration, depth of invagination and its localization within coronal or root portion of tooth, proximity to the pulp and pretreatment pulp and periodontium vitality conditions, while also with periapical status in means of apex size and thickness of root residual walls.

Background

Dens in dente represents developmental anomaly of tooth structure, characterized with different depth of invagination lined with either enamel or cementum, and associated with different clinical and roentgenological features [1, 2, 3, 4, 5, 6]. In most clinical cases such anomaly could be found among maxillary anterior teeth [6].

Previously it was reported that prevalence of dens invaginatus may vary in the range of 0,3-10% [7], but in Colak et al. study authors reported tooth prevalence level equal to 0,008%, while person prevalence level – 0,17% [8].

Updated data regarding dens in dente prevalence shown 26% prevalence of dens invaginatus among 1621 observed maxillary incisors of young Israeli population. It was also noted that the prevalence of dens in dente among examined patients sample was higher than among analyzed maxillary incisors sample (47% vs. 37%), while also 90% of teeth with dens invaginatus accounted for Type I by Oehlers classification [6].

Cone-beam computed tomography-based study demonstrated 13.5% prevalence of dens in dente, while author also mentioned that such anomaly highly associated with asymptomatic apical and lateral periodontitis [9]. On the other hand, study of Hedge et al. reported 1.1% prevalence of dens invaginatus among Western Indian population using cone-beam computed tomography method for pathology detection [10]. In the only available systematic review of Alexoudi V.-A. et al., which included analysis of 28 studies, prevalence of dens-invaginatus was reported to be in the range of 0.3-26% [4].

Different variations within possible configurations of dens invaginatus were previously described in literature, based on which even additional classes for Oehlers classification were proposed. Gul et al. presented a case of so-called IV class of dens in dente, which is characterized by invagination extension into pulp chamber beyond cementoenamel junction level with further communication apically and laterally at the periodontium by the pseudoforamen [11]. Moreover, coronal and radicular types of dens in dente were also described in the literature [7]. Clinically dens invaginatus may be associated with dilated crown, microdontia, talon cusp or dens evaginatus, labial groove, palatal groove or pit, barrel- or cone-shaped teeth [7].

Such diversity of dens invaginatus arguments the need for adapted advanced treatment, which could guarantee further successful outcome at long-term perspective.

Considering the prevalence levels of dens invaginatus, complexity of its possible anatomical configuration, and deficiency of standardized treatment approaches, systematization of available treatment options seems to be relevant and contemporary, while analysis of such in different clinical scenarios could help clinicians to choose the most acceptable therapeutic algorithm for specific clinical conditions.

Objective

To methodize available treatment options for dens invaginatus in systematic manner and analyze suitability of such for different clinical scenarios.

Materials and Methods

Literature search

Aggregation of data regarding treatment options for dens invaginatus cases was provided through literature search within Pubmed Central (https://www.ncbi.nlm.nih.gov/pmc/) and PubMed (https://pubmed.ncbi.nlm.nih.gov/) databases using the following combinations of Mesh-terms:

- ("dens in dente"[MeSH Terms] OR ("dens"[All Fields] AND "dente"[All Fields]) OR "dens in dente"[All Fields] OR ("dens"[All Fields] AND "invaginatus"[All Fields]) OR "dens invaginatus"[All Fields]) AND ("therapy"[Subheading] OR "therapy"[All Fields] OR "treatment"[All Fields] OR "therapeutics"[MeSH Terms] OR "therapeutics"[All Fields])
- ("dens in dente"[MeSH Terms] OR ("dens"[All Fields] AND "dente"[All Fields]) OR "dens in dente"[All Fields] OR ("dens"[All Fields] AND "invaginatus"[All Fields]) OR "dens invaginatus"[All Fields]) AND ("guideline"[All Fields] OR "guidelines as topic"[MeSH Terms] OR "guidelines"[All Fields])
- ("dens in dente"[MeSH Terms] OR ("dens"[All Fields] AND "dente"[All Fields]) OR "dens in dente"[All Fields] OR ("dens"[All Fields] AND "invaginatus"[All Fields]) OR "dens invaginatus"[All Fields]) AND "update"[All Fields] [12].

Google Scholar (https://scholar.google.com/) search was applied for identification of texts, which are potentially could be related with the objective of the study, but not indexed within above mentioned databases. No limitations or filters were used regarding year of publication, article attribute, article type and journal, while filters for articles only in English were applied with availability of at least article's abstract.

Primary aggregated publications cohort was reduced after analysis of titles and abstracts, and further optimized after categorization of information presented in the full texts due its compliance or non-compliance with formulated research objective. Only those publications that represent data regarding treatment options for dens invaginatus clinical cases and discuss suitability of different treatment approaches for various clinical scenarios were included into the final sample of articles, which undergone further qualitative content-analysis.

Literature review was provided in accordance to the available guidelines [13, 14, 15].

Results

Overall 26 publications were included for literature review regarding available treatment options for dens invaginatus, which included following:

- clinical implications and antimicrobial endodontic treatment considerations for dens invaginatus cases [2] – 1 article;
- diagnostic and treatment guidelines of dens invaginatus for practicing dentists in form of literature review [3, 5, 32, 33, 34] – 5 articles;
- update on the diagnosis and treatment of dens invaginatus [7] – 1 article;
- diagnostic and therapeutic approaches for dens in dente in form of case report with or without associated literature review [16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 35, 36, 37] – 18 articles;
- diagnostic and therapeutic approaches for dens in dente in form of case series with or without associated literature review [31] – 1 article;

Discussion

Primary teeth with dens in dente could be extracted if associated periapical lesions may provoke complications regarding germ of adjacent permanent tooth [7]. In several presented cases extraction may also be considered as treatment option if problematic tooth was characterized with impaction, crowding or was presented as supernumerary tooth [7].

For Type I dens invaginatus different sealing approaches could be used depending on the initial depth of invagination. Shallow invaginations may be sealed with flowable composite, while such with clinically significant depth may be sealed by flowable composite and covered with composite resin restoration over flowable one, if there is significant distance between invagination's floor and the pulp chamber. If latter distance is deficient indirect pulp capping procedure with further composite filling may be considered as treatment option [16]. If the entrance of the invagination is too small and restricts the admittance of flowable composite, fissure sealant could be used as an alternative [7].

Clinical signs of pulp necrosis argument the need for root canal treatment of teeth with dens invaginatus even if Type I was detected. If limited pulp inflammation is present within the tooth with Type I dens invaginatus and immature apex there is also an option for vital pulpotomy [17]. Coraini et al. reported case of Type I dens invaginatus treatment by flap surgery and preventive MTA filling of invagination due to the present deep periodontal pocket and vital pulp status within original root canal [18].

Under the absence of pulp affection signs decayed tissue excavation, indirect pulp capping and further composite restoration could be provided for Type II invaginations. Before the invagination sealing prepared cavity should be disinfected through chlorhexidine or 1% sodium hypochlorite irrigation [17]. If pulp status is vital MTA and glass ionomer cements also may be used as a filling material for Type II invaginations due to its biocompatibility, with further composite restoration [7]. Clinical case of dens invaginatus filling with glass ionomer cement demonstrated on Figure 1.

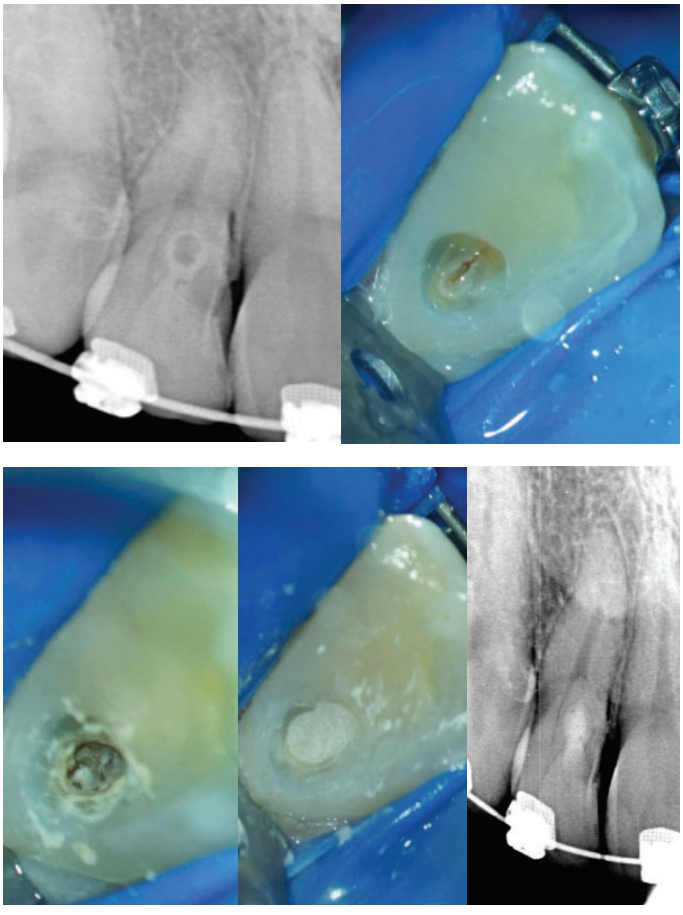

Figure 1. Filling of dens invaginatus with glass ionomer cement and further covering by composite restoration. No endodontic treatment was provided for main canal (X-rays images provided from clinical practice of Dr. Volodymyr Fedak)

Nevertheless, most of Type II dens in dente associated with either irreversible pulpitis or pulp necrosis, which makes root canal treatment inevitable.

In Zhu et al. update on dens in dente treatment authors recommended to remove invagination if such extends to the level of middle or apical third of the root during endodontic treatment. Invagination removal could be provided by the ultrasonic tips, K- or H-files, or fissure bur [7].

In Type III dens invaginatus only false canal could be independently endodontically treated if dentist could diagnose the vitality of the pulp. Such approach may be categorized as preventively-oriented. If during the diagnostic procedure any signs of irreversible pulp complications could be identified, then endodontic treatment for both (false and original) canals should be provided. Dentists also should be aware of so-called peri-invagination periodontitis, during which treatment should not interfere healthy pulp status within original root canal [17].

Independently of the type of invagination endodontic treatment of teeth with dens invaginatus require accurate analysis of the clinical conditions and root morphology configuration to receive successful result of iatrogenic intervention [2, 7, 17, 18].

Pulpal complications related with dens invaginatus may developed either in teeth with completed root development or in teeth with incomplete root development. If endodontic treatment due to the dens in dente complications is needed before full apex closure than specialist should choose between apexification with the use of MTA or biodentine, or traditional gutta-percha obturation. Also, several apexification approaches were described during endodontic treatment of teeth with dens invaginatus [19]. Nevertheless, it should be kept in mind that apexification of the invaginated canal in means of forming hard tissue barriers in most cases is unsuccessful if the invagination projects laterally to main canal [7]. Such prognosis may be caused by the deficient regenerative capabilities of the cells located in the region of pseudo-foramen. If the invagination located centrally to original canal, apexification of both of them may be successful, because both of the communicate with the periodontal ligament in the root zone which remain under development [7].

In adequate infection control pulp revascularization of endodontically treatment teeth with dens invaginatus may be assumed as potential treatment option [20, 21, 22]. In Kaya-Büyükbayram et al. case report revascularization protocol was modified, since author provided instrumentation within only invaginated Type III canal, while original root canal was not exposed [23]. Narayana et al. described successful results of revascularization procedure after removal of dens out of the trunk of the main root [21].

In some cases, invagination could be totally removed, thus creating one large endodontic environment, which further should be treated due to the main principles of root canal instrumentation and irrigation [16]. Such approach has been named anatomical redesign or anatomical modification, and especially useful in cases of secondary endodontic treatment or when the original configuration of dens in dente challenges adequate instrumentation, disinfection and sealing of root canal [17, 24]. Examples of dens invaginatus treatment by anatomical redesign technique demonstrated on Figure 2 and 3.

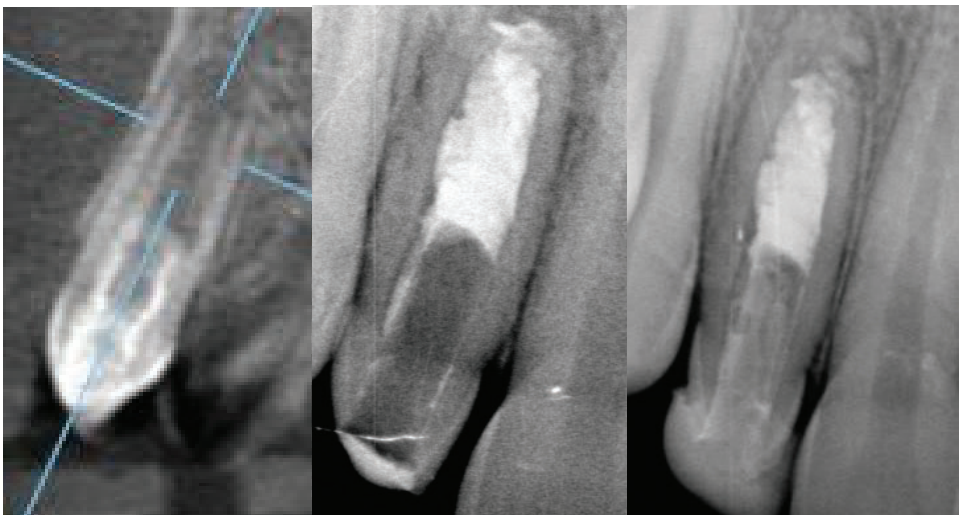

Figure 2. Treatment of dens invaginatus by technique of anatomical redisign: removal of the invagination and forming one wide endodontic space, root canal treatment and obturation with MTA; recall in 2 years demostrates successful results of treatment (X-rays images provided from clinical practice of Dr. Volodymyr Fedak)

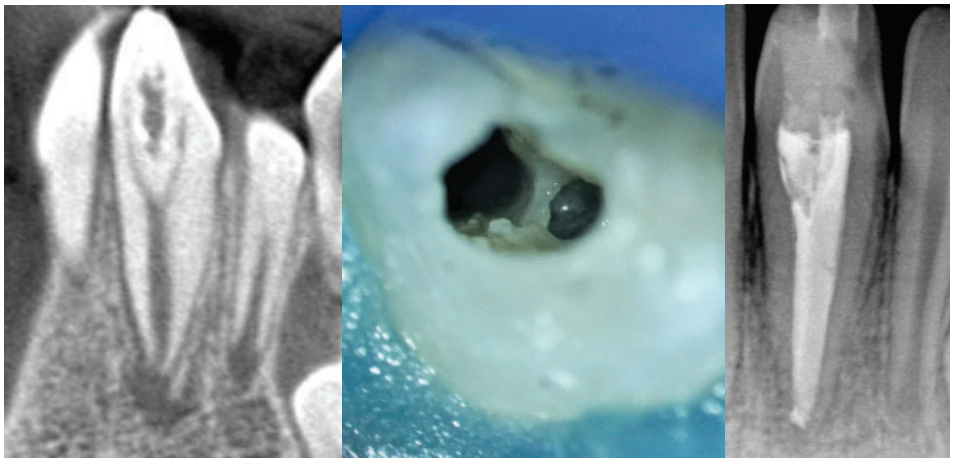

Figure 3. Treatment of dens invaginatus by technique of anatomical redesign: forming connection between lingual pulp horn and dens invaginatus, root canal treatment and obturation with guttapercha (clinical photo and X-rays images provided from clinical practice of Dr. Volodymyr Fedak)

In recent years such material as collagen membrane has been proposed to be used as apical barrier during non-surgical root canal treatment of teeth with open apex and immature root development [25, 26]. Also, platelet-rich fibrin has been used as apical barrier during Oehlers Type II dens invaginatus treatment, while root canal was filled with Biodentine after invaginated hard tissue mass removal [27]. Mohan et al. expand such protocol by adding freeze-dried demineralized bone graft to fill bone defect at the periapical area of tooth with radicular dens invaginatus associated complications [28].

Few cases demonstrated possibilities of using guided endodontic approach for dens invaginatus treatment [29, 30].

Well organized treatment flowcharts for different types of dens invaginatus are presented in the publication of Zhu et al., where author had structured all the needed information not only for Oehlers' 3 types of dens in dente, but also for crown and root types of pathology [7]. For the root-type dens invaginatus such treatment options, as endodontic intervention, periapical surgery, replantation or extraction may be considered [7].

Based on comprehensive case series it was proposed to extend classical Oehlers classification by adding three additional subtypes for Type II dens in dente considering different depth of invagination (to the coronal third of the root, to the middle third of the root and to the apical third of the root) [31]. Authors argumented the need for the additional division within originally proposed classification due to the diversity of treatment approaches, which could be applied to different case scenarios; and even though the final treatment plan is case-dependent, preliminary intervention protocol should be developed based on the CBCT results [31]. Authors recommended conservation of endoenvironment with thermoplasticized within main root canal and MTA within invagination, if depth of such reach coronal third or middle third of the root [31]. If the invagination extends to the apical third of the root then revascularization may be considered for immature teeth (when thickness of root walls is less than 1 mm), while effective apical seal may be obtained by root end filling and further obturation [31].

Extraction also remains a treatment option, even though biological argumentation of such for dens in dente cases is case dependent. It is worth to mention that extraction was considered as preferred method for dens invaginatus treatment until 1970's due to the challenges associated with prognosis of endodontic treatment [17; 32]. In clinical guidelines for dens invaginatus treatment extraction as targeted intervention option could be considered for mesiodens, non-restorable tooth, excessively wide apex cases, and also when provided endodontic and/or surgical treatment has failed [32].

Based on the provided state of art literature review regarding available treatment options for dens invaginatus cases following clinical and roentgenological key aspects should be taken into consideration before choosing algorithm of intervention:

1) type of dens in dente (due to Oehlers classification, coronal or root type);

2) depth of invagination (to the coronal third of the root, to the middle third of the root or to the apical third of the root);

3) proximity of the invagination to the pulp;

4) projection of invagination regarding main root canal (laterally or centrally);

5) size of hard dental tissue aggregation that forms invagination;

6) possibility to provide adequate endodontic treatment and obtain sufficient infection control;

7) pulp vitality status and presence/absence of peri-invagination periodontitis;

8) apex size, developmental condition of the apex and thickness of root residual walls;

9) accessibility of all needed instruments and materials for preplanned treatment;

10) success of previously provided or initiated treatment [7, 17, 33, 34, 35, 36, 37].

Provided literature review helped to establish four main strategies of treating teeth with present dens invaginatus anomaly: 1) preventive treatment (with no endodontic intervention); 2) preventive treatment (with endodontic intervention only in invaginated canal); 3) treatment of dens invaginatus-associated complications (with endodontic treatment of original and invaginated canals); 4) complex treatment of dens invaginatus-associated complications, which includes not only root canal treatment, but also periodontal treatment and other potential treatment options, such as extraction. In some cases, realization of above-mentioned strategies may be consecutive, while in real-life clinical practice dentist should provide case-dependent treatment choosing the most appropriate strategy and adapting previously described guidelines and recommendations to the specific individual clinical conditions.

Conclusions

Dens invaginatus represents several clinical challenges during the treatment, which are related with type of structural anomaly due to the Oehlers classification, variability of its configuration, depth of invagination and its localization within coronal or root portion of tooth, proximity to the pulp and pretreatment pulp and periodontium vitality conditions, while also with periapical status in means of apex size and thickness of root residual walls.

Relevant strategies of dens invaginatus treatment could be characterized as preventive regarding risk of possible complications, nevertheless different treatment options associated with various intervention levels. Even though treatment of dens invaginatus in most situations is case-dependent, but dentist should take into account available considerations and guidelines, which further may be adapted to the individual clinical conditions.

Conflict of interest

The author declares no conflict of interests that may influence the decision to publish this article.

References

1. Tebbeb N, Zaabar D, Zouiten S, Boughzala A. Dens invaginatus: A review and case series. Saudi Endod J. 2018;8(1):44. doi: 10.4103/sej.sej_70_16
2. Siqueira Jr JF, Rôças IN, Hernández SR, Brisson-Suárez K, Baasch AC, Pérez AR, Alves FR. Dens invaginatus: clinical implications and antimicrobial endodontic treatment considerations. J Endod. 2021;48(2):161-170. doi: 10.1016/j.joen.2021.11.014
3. Thakur Narbir S, Seema T. Dens Invaginatus (Tooth Within Tooth). A Review Of The Literature And Diagnostic And Management Guidelines For Practicing Dentists. Ind J Dent Sci. 20121;4(3):111-116.
4. Alexoudi VA, Deligiannidis D, Antoniadis K, Tatsis D. Tooth within a tooth (dens in dente): A case report and a systematic review of population studies. Hellenic Arch Oral Maxillofac Surg. 2020;21(2):95-102.
5. Baumgart M, Hänni S, Suter B, Schaffner M, Lussi A. Dens invaginatus. Review of the literature and diagnostic and therapeutic guidelines. Schweiz Monatsschr Zahnmed. 2009;119(7):697-714.
6. Kfir A, Flaisher Salem N, Natour L, Metzger Z, Sadan N, Elbahary S. Prevalence of dens invaginatus in young Israeli population and its association with clinical morphological features of maxillary incisors. Sci Rep. 2020;10(1) :17131. doi: 10.1038/s41598-020-74396-z
7. Zhu J, Wang X, Fang Y, Von den Hoff JW, Meng L. An update on the diagnosis and treatment of dens invaginatus. Aust Dent J. 2017;62(3):261-75. doi: 10.1111/adj.12513
8. Çolak H, Tan E, Aylıkçı BU, Uzgur R, Turkal M, Hamidi MM. Radiographic study of the prevalence of dens invaginatus in a sample set of Turkish dental patients. J Clin Imaging Sci. 2012;2:34. doi: 10.4103/2156-7514.97755
9. Varun K, Arora M, Pubreja L, Juneja R, Middha M. Prevalence of dens invaginatus and palatogingival groove in North India: A cone-beam computed tomography-based study. Journal of Conserv Denti. 2022;25(3):306-310. doi: 10.4103/jcd.jcd_46_22
10. Hegde V, Mujawar A, Shanmugasundaram S, Sidhu P, Narasimhan S, Setzer FC, Nagendrababu V. Prevalence of dens invaginatus and its association with periapical lesions in a Western Indian population—a study using cone-beam computed tomography. Clin Oral Investig. 2022;1-9. doi: 10.1007/s00784-022-04545-3

11. Gul M, Adnan S, Umer F. A variant of the current dens invaginatus classification. Front Dent. 2020;17:1-4. doi: https://doi.org/10.18502/fid.v17i28.4654
12. Mahobia A, Vyas S, Deshmukh S. PubMed Search: How to get Optimum Results?. Delhi J Ophthalmol. 2019;29(4):17-21. doi: http://dx.doi.org/10.7869/djo.435
13. Snyder H. Literature review as a research methodology: An overview and guidelines. J Bus Res. 2019;104:333-9. doi: https://doi.org/10.1016/j.jbusres.2019.07.039
14. Schryen G. Writing qualitative is literature reviews—guidelines for synthesis, interpretation, and guidance of research. Commun Assoc Inform Syst. 2015;37(1):12. doi: 10.17705/1CAIS.03712
15. Eriksen MB, Frandsen TF. The impact of patient, intervention, comparison, outcome (PICO) as a search strategy tool on literature search quality: a systematic review. J Med Libr Assoc. 2018;106(4):420-431. doi: 10.5195/jmla.2018.345
16. Lejri W, Kallel I, Marwen O, Douki N. Diagnostic and therapeutic approach in dens in dente. Endodont. 2016;28(2):192-198. doi: 10.4103/0970-7212.195432
17. Abduljabbar F, Aljehani M, Al Sharafi E, Bakhsh A, Abed H, Alghamdi A. Anatomical Modification for Dens Invaginatus Treatment: A Literature Review and a Case Report. J Intern Oral Health. 2015;7(12):119.
18. Coraini C, Mascarello T, de Palma CM, Gobbato EA, Costa R, de Micheli L, Castro D, Giunta C, Rossi S, Casto C. Endodontic and periodontal treatment of dens invaginatus: report of 2 clinical cases. G Ital Endod. 2013;27(2):86-94. doi: https://doi.org/10.1016/j.gien.2013.09.005
19. Ferguson FS, Friedman S, Frazzetto V. Successful apexification technique in an immature tooth with dens in dente. Oral Surg Oral Med Oral Pathol. 1980;49(4):356-9. doi: 10.1016/0030-4220(80)90147-4
20. Yang J, Zhao Y, Qin M, Ge L. Pulp revascularization of immature dens invaginatus with periapical periodontitis. J Endod. 2013;39(2):288-92. doi: 10.1016/j.joen.2012.10.017
21. Narayana P, Hartwell GR, Wallace R, Nair UP. Endodontic clinical management of a dens invaginatus case by using a unique treatment approach: a case report. J Endod. 2012;38(8):1145-8. doi: 10.1016/j.joen.2012.04.020
22. Kumar H, Al-Ali M, Parashos P, Manton DJ. Management of 2 teeth diagnosed with dens invaginatus with regenerative endodontics and apexification in the same patient: a case report and review. J Endod. 2014;40(5):725-31. doi: 10.1016/j.joen.2013.10.030
23. Kaya-Büyükbayram I, Özalp Ş, Aytugar E, Aydemir S. Regenerative endodontic treatment of an infected immature dens invaginatus with the aid of cone-beam computed tomography. Case Rep Dent. 2014;2014 :403045. doi: 10.1155/2014/403045
24. Silberman A, Cohenca N, Simon JH. Anatomical redesign for the treatment of dens invaginatus type III with open apexes: a literature review and case presentation. J Am Dent Assoc. 2006;137(2):180-5. doi: 10.14219/jada.archive.2006.0142
25. Gharechahi M, Ghoddusi J. A nonsurgical endodontic treatment in open-apex and immature teeth affected by dens invaginatus: using a collagen membrane as an apical barrier. J Am Dent Assoc. 2012;143(2):144-8. doi: 10.14219/jada.archive.2012.0124
26. Van Pham K, Tran TA. Effectiveness of MTA apical plug in dens evaginatus with open apices. BMC Oral Health. 2021;21(1):1-9. doi: https://doi.org/10.1186/s12903-021-01920-6
27. Goel S, Nawal RR, Talwar S. Management of dens invaginatus type II associated with immature apex and large periradicular lesion using platelet-rich fibrin and biodentine. J Endod. 2017;43(10):1750-5. doi: 10.1016/j.joen.2017.04.005
28. Mohan A, Krishnan U, Akber M, Nair MG, Balan A. Successful management of a case of true radicular dens invaginatus using platelet-rich fibrin and guided tissue regeneration. Aust Endod J. 2020;46(1):94-100. doi: https://doi.org/10.1111/aej.12377
29. Ali A, Arslan H. Guided endodontics: a case report of maxillary lateral incisors with multiple dens invaginatus. Restor Dent Endod. 2019;44(4):e38. doi: 10.5395/rde.2019.44.e38
30. Ali A, Arslan H, Jethani B. Conservative management of Type II dens invaginatus with guided endodontic approach: A case series. J Conserv Dent. 2019;22(5):503-508. doi: 10.4103/JCD.JCD_30_20
31. Kritika S, Bhandari SS, Benyöcs G, Machado PA, Bishnoi N, Restrepo-Restrepo FA, Karthikeyan K, de Ataide I, Mahalaxmi S. Demystifying Dens Invaginatus: Suggested Modification of the Classification based on a Comprehensive Case Series. Eur Endod J. 2022;7(1):73-80. doi: 10.14744/eej.2021.48303
32. Achabi N, Chhoul H, Ramdi H. Clinical Guideline for Diagnosis and Treatment of Dens Invaginatus. Integr J Med Sci. 2021;8:1-4. doi: https://doi.org/10.15342/ijms.2021.448
33. Gallacher A, Ali R, Bhakta S. Dens invaginatus: diagnosis and management strategies. Bri Dent J. 2016;221(7):383-7. doi: 10.1038/sj.bdj.2016.724
34. Zhang C, Hou BX. Reconsideration of the diagnosis and treatment for dens invaginatus. Zhonghua Kou Qiang Yi Xue Za Zhi. 2020;55(5):302-8. doi: 10.3760/cma.j.cn112144-20200303-00111
35. Kristoffersen Ø, Nag OH, Fristad I. Dens invaginatus and treatment options based on a classification system: report of a type II invagination. Int Endod J. 2008;41(8):702-9. doi: 10.1111/j.1365-2591.2008.01399.x
36. Zubizarreta-Macho Á, Ferreiroa A, Agustín-Panadero R, Rico-Romano C, Lobo-Galindo AB, Mena-Álvarez J. Endodontic re-treatment and restorative treatment of a dens invaginatus type II through new technologies. J Clin Exp Dent. 2019;11(6):e570-e576. doi: 10.4317/jced.55840
37. Abazarpour R, Parirokh M, Farhadi A, Jalali Z, Kheirabadi N. Successful ultra-conservative management of a mandibular premolar with dens invaginatus. Iran Endod J. 2017;12(3):390-395. doi: 10.22037/iej.v12i3.16559

ISSN 2786-6297 (print) ISSN 2786-6572 (online)
Український стоматологічний журнал
УДК: 616.314-007.44(048.8)
DOI: 10.56569/UDJ.1.1.2022.37-42

U D J
Ukrainian Dental Journal

Варіанти лікування dens in dente: огляд актуальних даних літератури

Володимир Федак [A, B, C, D, E, F]
лікар-стоматолог, приватна практика, Чернівці, Україна
ORCID ID: 0000-0001-6840-6945

Відповідальний автор для листування: Володимир Федак, приватна стоматологічна клініка «Віва Дент», вул. Білоусова, 8, Чернівці, Чернівецька область, 58000 Україна
E-mail: fedakvova@gmail.com

A – розробка концепції та дизайну дослідження, B - збір та або систематизація даних дослідження, C - аналіз та тлумачення даних дослідження, D - написання публікації, E - критичне доопрацювання тексту публікації, F- остаточне затвердження.

Стаття:

Історія статті:
Надійшла до редакції 7 червня 2022
Прийнята до друку 28 липня 2022
Доступна онлайн 1 Жовтня 2022

Ключові слова:
dens in dente, зуб в зубі,
dens invaginatus,
інвагінація, лікування,
ендодонтичне лікування,
огляд літератури

Анотація

Вступ. Dens in dente це аномалія розвитку будови зуба, яка характеризується різною глибиною інвагінації, покрита емаллю або цементом і має різні клініко-рентгенологічні прояви.

Мета. Систематично упорядкувати відомі варіанти лікування dens invaginatus та проаналізувати доцільність вибраного методу для різних клінічних випадків.

Матеріали та методи. Накопичування даних щодо варіантів лікування випадків з dens invaginatus було проведено шляхом пошуку літератури в базах даних Pubmed Central і PubMed. Огляд літератури було виконано згідно з загальноприйнятими методичними рекомендаціями.

Результати. Проведений огляд літератури дозволив встановити чотири основні стратегії лікування зубів з наявною аномалією dens invaginatus:

1) профілактичне лікування (без ендодонтичного втручання); 2) профілактичне лікування (з ендодонтичним втручанням тільки в інвагінований канал); 3) лікування ускладнень dens invaginatus (з ендодонтичним лікуванням інвагінованих каналів та основного кореневого каналу); 4) комплексне лікування ускладнень dens invaginatus, яке включає не лише лікування кореневих каналів, а й лікування пародонту та інші потенційні варіанти лікування, наприклад видалення.

Висновок. При лікуванні Dens Invaginatus може виникнути кілька клінічних проблем пов'язаних із типом структурної аномалії за класифікацією Oehlers, варіабельністю її конфігурації, глибини інвагінації та її локалізації в коронковій або кореневій частині зуба, близькості розміщення інвагінації до пульпи. Також, обираючи варіант лікування необхідно враховувати періапікальний статус, розмір апікального отвору та товщину залишкових стінок кореня.

Конфлікт інтересів
Автор заявляє про відсутність конфлікту інтересів, який може вплинути на рішення про публікацію цієї статті.

Фінансування
Жодного фінансування не було отримано на проведення цього дослідження.

https://doi.org/10.56569/UDJ.1.1.2022.37-42