Artigo Clínico

Autotransplante de terceiro molar com formação radicular completa e preservação periodontal

Autotransplant of Third Molar with Complete Root Formation and Periodontal Preservation
Autotrasplante de un tercer molar maduro y preservación periodontal

RESUMO

Objetivo: relatar um caso clínico de Autotransplante de Terceiro Molar com Formação Radicular Completa e Preservação Periodontal. **Relato de caso**: jovem de 20 anos, negra, sexo feminino, compareceu à consulta apresentando como queixa principal dor de dente. A paciente desejava proceder à extração do segundo molar inferior esquerdo que apresentava extensa lesão de cárie e grande destruição coronária. Duas opções de tratamento foram sugeridas: tratamento endodôntico do segundo molar inferior esquerdo com confecção posterior de uma coroa protética fixa ou a realização de um autotransplante. A paciente optou pelo tratamento de autotransplante. Um planejamento cirúrgico minucioso é fundamental para o sucesso de um procedimento de autotransplante. A anatomia e as dimensões do dente doador foram investigadas para adequar-se ao alvéolo receptor. A revascularização da polpa pode estar relacionada ao estágio de desenvolvimento do dente transplantado; no entanto, este relato de caso mostra um transplante bem-sucedido mesmo com formação radicular completa. **Conclusão:** O dente transplantado apresentou condições clínicas saudáveis e está responsivo à estimulação elétrica pulpar mesmo após 3 anos de acompanhamento. **Palavras-chave:** Autotransplante; Reabilitação oral; Cirurgia oral; Terceiro molar

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ABSTRACT

Objective: This paper aims to report a clinical case of Autotransplant of Third Molar with Complete Root Formation and Periodontal Preservation. **Case report**: a 20-year-old afro-caucasian female attended for a consult presenting tooth pain as her main complaint. The patient wished to proceed with the extraction of her left lower second molar which presented with extensive carious lesion and great coronary destruction. Two treatment options were suggested: endodontic treatment of the left second mandibular tooth with posterior confection of a fixed prosthetic crown or the performance of an autotransplant. The patient chose the autotransplantation treatment. A thorough and careful surgical planning is crucial to the success of an autotransplant procedure. The anatomy and dimensions of the donor tooth were investigated to conform in the receptor socket. The revascularization of the pulp might be related to the stage of the development of the transplanted tooth; however, this case report shows a successful transplant even with complete radicular formation. **Conclusion**: The transplanted tooth displayed healthy clinical conditions and is responsive to electrical pulp stimulation after a 3-year follow-up. **Keywords**: Autologous transplant; Oral rehabilitation; oral surgery; Third molar.

ISSN 1808-5210 (Online)
ISSN 1679-5458 (Linking)

RESUMEN

Objetivo: reportar un caso clínico de autotrasplante de tercer molar con formación completa de raíces y preservación periodontal. **Caso clínico**: una mujer afrocaucásica de 20 años atendió a una consulta presentando dolor de dientes como su principal queja. La paciente deseaba proceder la extracción de su segundo molar inferior izquierdo que presentaba una lesión cariosa extensa y una gran destrucción coronaria. Se sugirieron dos opciones de tratamiento: tratamiento endodóntico del segundo diente mandibular izquierdo con confección posterior de una corona protésica fija o la realización de un autotrasplante. El paciente eligió el tratamiento de autotrasplante. Una planificación quirúrgica exhaustiva y cuidadosa es crucial para el éxito de un procedimiento de autotrasplante. La anatomía y las dimensiones del diente del donante fueron investigadas para conformarse en la cavidad del receptor. **Conclusión**: La revascularización de la pulpa podría estar relacionada con la etapa del desarrollo del diente trasplantado; sin embargo, este informe de caso muestra un trasplante exitoso incluso con formación radicular completa. El diente trasplantado mostró condiciones clínicas saludables y es sensible a la estimulación de la pulpa eléctrica después de un seguimiento de 3 años.
Palabras clave: trasplante autólogo; rehabilitación oral; cirugía oral; tercer molar.

INTRODUCTION

Tooth loss may cause physiognomy alteration and associated malocclusion, resulting in disorder in the individual's quality of life, mainly when it affects their well-being and appearance. Additionally, other adverse health effects from tooth loss include periodontal changes, bone reabsorption, as well as complications related to the masticatory function and skeletal and speech-language relations changes.[1]

Dental autotransplantation is a surgical procedure in repositioning an autogenous tooth from its original socket to an extracted site or into a surgically repaired dental socket of the same person that can be an alternative procedure for tooth loss. Autotransplantation is a treatment option recommended in cases of agenesia, early teeth loss due to cavities, ectopic teeth, trauma loss, and social and economic factors when prosthodontic rehabilitation is not available.The advantages of autotransplantation include the possibility of protecting the periodontal ligament viability, proprioception and preservation of alveolar bone, proprioception, and preservation of gingival natural contours.[2] In addition, the autotransplant can be performed on young patients experiencing craniofacial development where bone integrated implants are not indicated. The cost consideration for this procedure is significantly lower than other rehabilitating procedures, such as bone integrated implants.[3]

This paper aims to report a clinical case of dental autotransplantation using the lower left third molar as a donor to the socket of the extracted lower left second molar.

CASE REPORT

A 20-year-old afro-caucasian female came for a consult to proceed with the extraction of the left inferior second molar which presented extensive carious lesion and great coronary destruction. The patient did not report any painful event in the aforementioned tooth.

The radiographic exam showed extensive radiolucent area suggesting carious lesion, which was posteriorly confirmed on the clinical exam, affecting the occlusal area, as well as the distal, occlusal-lingual, and occlusal-buccal regions. The tooth also presented enlargement of the lamina dura in the periapical region (Figure 1).

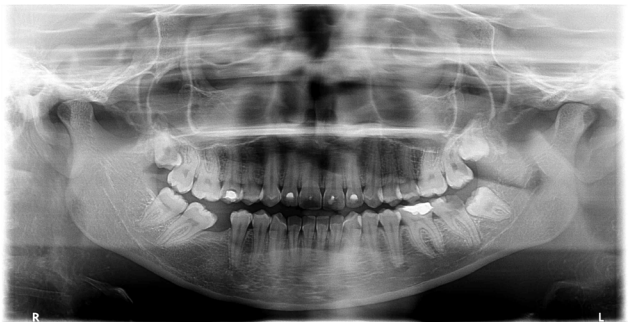

Figure 1 - Panoramic radiography showed extensive radiolucent area suggesting carious lesion.

Two treatment options were suggested: endodontic treatment of the tooth with posterior confection of a fixed prosthetic crown and the performance of an autotransplant since the adjacent tooth, the lower left third molar needed to be extracted due to impaction. The patient chose autotransplantation treatment.

The donor tooth was evaluated for its anatomy and showed appropriate dimensions for an autotransplant. It was classified as a class II tooth according to the Pell & Gregory (1933) impact classification and presented mesial angulation consequently indicating a low degree of complexity. The donor tooth also showed no periodontal compromise with uniform roots without major dilacerations or angulation that could negatively affect a subsequent endodontic treatment.

The surgical procedure was carried out according to the previously established protocol. Dexamethasone (4mg) was administered 1 hour before the procedure as preemptive analgesia. The intraoral antisepsis was performed with the use of Chlorhexidine 0,12% and 2% extraoral. The aseptic technique was kept with sterilized fields and gloves.

The lower left second molar was extracted and the curettage of the socket was performed once in the apical region. Thus, the largest amount of fibers from the periodontal ligament were preserved and prevented the presence of granulation tissue from the pre-existing carious lesion.

Subsequently, the extraction of the lower left third molar was carried out first utilizing elevators in contact with only the coronary portion. After the luxation, the tooth was removed with forceps and was immediately placed in the receptor site socket. After the adaptation of the donor tooth, both donor and receptor sites were sutured. The receptor site was sutured with the "X" suture technique using Nylon 4-0 suture, maintaining the adapted tooth in place (Figure 2). An occlusal adjustment was also performed to keep the transplanted tooth out of occlusal mastigatory forces after surgery.

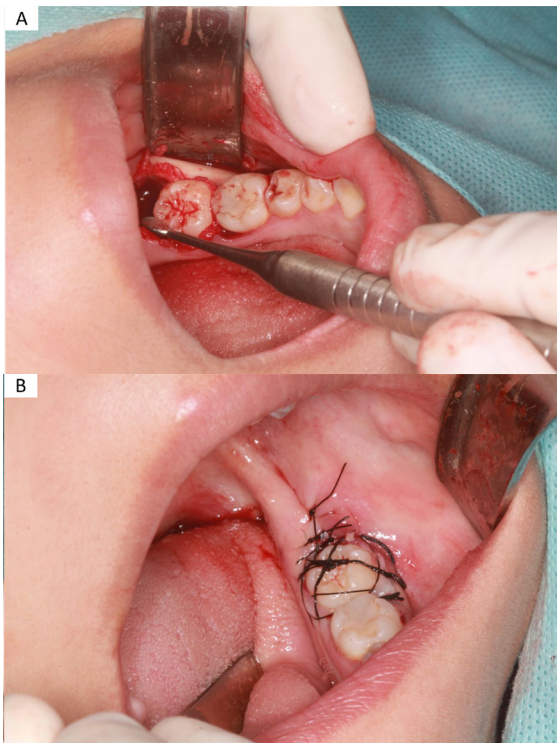

Figure 2 - A) Third molar placed in the receptor site socket B) Flexive suture with "X" suture technique

The patient was oriented to follow all the post-surgery recommendations. She was oriented to use Elixir Sanativo® at home, which is a phytotherapy compound, traditional in the Northeastern region in Brazil. Elixir Sanativo®'s composition contains: Piptadenia colubrina Benth (20%), Schinus terebinthifolius Raddi (20%), Physalis angulata Linné (1,7%) and Cereus peruvianus Miller (1,7%).

After 3 years of follow-up surgery, the patient presented satisfactory adaptation and good periodontal health, observed through probing depth. There were no clinical and radiographic signs of infection, inflammation, pain, mobility, and receptivity to electrical pulp stimulation (Figure 3).

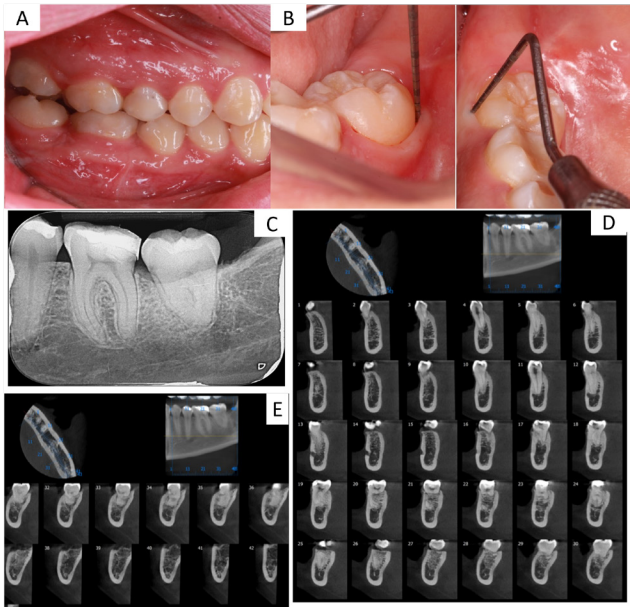

Figure 3 - A) Lateral view showing satisfactory occlusal relationship. B) Probing showing periodontal health. C) Peripical radiography. D) Cone beam tomography

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent: Informed consent was obtained from the participant included in the study and submitted as supplementary material.

DISCUSSION

A thorough and careful surgical planning is crucial to the success of the autotransplant procedure. The donor tooth and receptor site need to be meticulously examined in order to guarantee a satisfactory result. The periodontal ligament preservation and the absence of anchylosis absence are two of the main concerns in this technique.[2] The dehydration or damage to the periodontal ligament may decrease the viability of the periodontium.[4] Thus, the atraumatic extraction of the donor tooth is pivotal to protect such structures.

Nevertheless, this procedure can be considered as an avulsion and a planned re-implant, and

ISSN 1808-5210 (Online)
ISSN 1679-5458 (Linking)

so it is vital to reduce the time of the donor tooth in the extra-oral environment to a minimum. The vitality of the periodontal ligament is related to the extra-oral time and its conservation until the reimplantation process. The maintenance of periodontal ligament cells dictates the prognosis for a tooth reimplant.[4] The donor tooth of our case was evaluated anatomically and it showed proportional dimensions and suitable for an autotransplantation. The donor tooth was not periodontally compromised and displayed uniform roots without dilacerations or major curves that would be a barrier to an endodontic treatment in the future.

Varying postoperative stabilizing methods are presented in the literature. The fixation method is determined by the transplant's initial stability. If the transplanted tooth fits in the socket appropriately, the X suture is adequate in most cases. Recent publications suggest the use of a suture restraint for 7-10 days and a hard restraint for 4 weeks in cases in which the tooth is not well adapted.[2]

A systematic review based on evidence about luxated, avulsed, or fractured teeth indicate that the type of splinting was not a significant factor in the healing process and that the duration of immobilization lacked adequate evidenc.[5] However, several experimental studies concluded that immobilization for long periods of time inhibits periodontal regeneration leading to anchylosis and inflammatory root resorption.[2] The restraint method used in our case was an "X" suture technique with Nylon 4-0 suture, followed by the occlusal adjustment to keep the transplanted tooth in infra-occlusion and out of the range of masticatory forces until its full healing.[6]

The stage of radicular development has shown itself as one of the main factors that could affect the prognosis of an autotransplanted tooth. In a systematic review, the stage of the root development of the donor tooth was identified as the primary prognostic factor to the success of the autotransplantation.[7] The authors affirmed that revascularization of the pulp is strictly related to the stage of development of the transplanted tooth. Teeth with incomplete root formation are more likely to revascularization and reinnervation as described on other studies.[8]

Our results are consistent with Nie et al. (2018)[9], presenting a successful autotransplant with complete root formation. The transplanted tooth displayed excellent periodontal health with no signs of inflammation, infection or pain and response to electrical pulp stimulation after 3 years of clinical and radiographic follow-up. We believe that the revascularization of the pulp may have been influenced by the inflammation from the bone healing process from the left mandibular tooth socket, while the left third mandibular tooth was immediately transplanted and stayed out of the socket only for a minimum period of time (the transposition time). The healing potential and surgical repair promoted by the Elixir Sanativo® may have contributed to the favorable prognosis of this case.

Elixir Sanativo® is a phytotherapy compound traditionally used throughout the Northeastern region in Brazil. The formula contains: Piptadenia colubrina Benth (20%), Schinus terebinthifolius Raddi (20%), Physalis angulata Linné (1,7%) and Cereus peruvianus Miller (1,7%). The therapeutic action of this product is attributed to the composition and medicinal properties of the plants. This phytotherapic medicine is successfully used to reduce the area of open wounds within two weeks of topical use.[10] Based on the literature finding of its astringent, healing, anti-inflammatory, and anti-microbial features, we opted to use it as a post-surgical medicine.

Despite the positive results with immature teeth, it is also possible to achieve successful results with teeth presenting a complete root formation. The approach in the removal of the impacted tooth associated with the immediate transposition and the preservation of the periodontal structures of the receptor site may be the result of the success of the procedure. A flexible suture procedure may also have been appropriate for the conservation of the periodontal ligament and the non-formation of anchylosis.

CONCLUSION

In conclusion, the auto transplantation can be one more good option on oral rehabilitation when the case is well chosen. Since the surgeon respect the indications, particularities, limitations and execute a precise and delicate surgical procedure, the success of treatment can be reached.

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ISSN 1808-5210 (Online)
ISSN 1679-5458 (Linking)