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EVALUATION OF THE EFFECTIVENESS OF THE USE OF THE OSTEOPLASTIC METHOD "COLLAPSE" MATERIAL IN THE ROOT APICAL RESECTION OPERATION TOOTH BASED ON COMPUTED TOMOGRAPHY

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ANNOTATION. From 2016 to 2019, 18 patients aged 20-50 years with a diagnosis of "chronic apical periodontitis" were treated. Instrumental root canal treatment was performed using the Crown-Down method. The root canal was treated antibacterially with an erbium-chromium Waterlase MD (Biolase, USA) laser in the wavelength - mode. 2780 nm, power - 1.5 W, pulse duration - 140 μs, frequency - 20 Hz. The root canal was filled using the thermoplastic method of vertical condensation of gutta-percha.

Keywords: chronic apical periodontitis; osteoplastic materials; resection of the root tip of the tooth; computed tomography.

ANNOYATSIYA. 2016-yildan 2019-yilgacha "surunkali apikal periodontit" tashxisi bilan 20-50 yoshdagi 18 nafar bemor davolangan. Ildiz kanaliga instrumental ishlov berish Crown - Down usuli bo‘yicha amalga oshirildi. Ildiz kanaliga erbiy-xromli Waterlase MD (Biolase, AQSH) lazeri bilan to‘lqin uzunligi - rejimida antibakterial ishlov berildi. 2780 nm, quvvati - 1,5 Vt, impuls davomiyligi - 140 mks, chastotasi - 20 Gs. Ildiz kanali plombalandi guttaperchi vertikal kondensatsiyasining termoplastik usuli yordamida amalga oshirildi.

Kalit so‘zlar: surunkali apikal periodontit; osteoplastik materiallar; tishning ildiz uchi rezeksiyasi ; kompyuter tomografiyasi.

АННОТАЦИЯ. С 2016 по 2019 год проводилось лечение 18 пациентов в возрасте 20–50 лет с диагнозом «хронический апикальный периодонтит». Инструментальная обработка корневых каналов проводилась методом Crown-Down. Антибактериальная обработка корневых каналов проводилась эрбий-хромовым лазером Waterlase MD (Biolase, США) с длиной волны 2780 нм, мощностью 1,5 Вт, длительностью импульса 140 мкс, частотой 20 Гц. Корневой канал пломбировался термопластическим методом вертикальной конденсации гуттаперчи.

Ключевые слова: хронический апикальный периодонтит; остеопластические материалы; резекция верхушки корня зуба; компьютерная томография.

Introduction

Chronic apical periodontitis is one of the most common pathologies in modern dentistry [1]. Periodontal diseases still do not have a tendency to decrease [2]. The leading role in the development of chronic disease is played by microbial invasion of the endodontic system in apical periodontitis [3]. High-quality antibacterial treatment of root canals is the basis of endodontic treatment. Unfortunately, high-quality treatment of root canals and their obturation is not always possible. This is due to the complex structure of the root canals, which include anastomoses, apical deltas, curvatures of varying degrees, narrowing and expansion in different parts of the root canal [4]. In this regard, periapical foci appear, conservative treatment methods are not always effective. In such cases, surgical removal of the pathological focus becomes necessary.

After tooth-preserving operations, a gap remains in the bone tissue of the jaw, in the area of the resected root, which causes a number of complications, such as jaw fractures and its deformation. To prevent these complications, osteoplastic materials capable of optimizing bone tissue regeneration are used [5, 6]. They should be biocompatible, have osteoinductive, as well as osteoconductive properties. Many researchers have studied osteoplastic materials of different composition and origin in order to identify the best of them. [7, 8]. Currently, the most reliable method for studying the clinical results of the use of osteoplastic materials in dentistry is computed tomography, which allows assessing the structure and density of bone tissue in different projections [9, 10]. The aim of the work is to assess clinical effectiveness.

Use of osteoplastic material "Kollapan" in operations for resection of the tooth root apex based on computed tomography.

Material and methods

From 2016 to 2019, 18 patients aged 20-50 years with a diagnosis of "chronic apical periodontitis" were treated. Instrumental root canal treatment was performed using the Crown-Down method. The root canal was treated antibacterially with an erbium-chromium Waterlase MD (Biolase, USA) laser with a wavelength of 2780 nm, power of 1.5 W, pulse duration of 140 μs, frequency of 20 Hz. The root canal was filled using the thermoplastic method of vertical condensation of gutta-percha. Then, a root tip resection operation was performed. tooth. Under perfusion anesthesia, the causative teeth were cut into a trapezoidal shape. Muco-osseous plaque was removed using a rasp. Trepanation of the outer cortical bone plate, the root of the causative tooth in the top projection Trephine (Hu-Friedy, USA). Resection of the apex of the tooth root was performed using a Lindemann bur (Prima Dental Group, UK). The bone substitute was processed with a spherical bur strictly perpendicular to the tooth axis. Then a cavity was formed according to I. BOOSTER (Satelec, France) with a depth of 1 - 2.5 mm was introduced into the class in the root canal of the tooth using an ultrasound device. After hemostasis, retrograde sealing of the cavity in the root canal of the tooth was performed with ProRoot MTA cement. (Dentsply, USA). Then the bone cavity formed as a result of the operation was filled with xenogeneic osteoplastic material "Kollapan" ("Intermedapatit," Moscow). The mucosal-osseous membrane fragment was placed in place and fixed with sterile suture material "Vicryl" (Ethicon, USA). Dental computed tomography on the Kodak 9000D apparatus before the operation of resection of the tooth root apex; immediately after the operation; after 6 and 12 months.

Tomography mode: tube voltage 60 - 90 kW, anode current from 2 to 15 mA, generator frequency 140 kGs, focal spot - 0.5 mm CEI, total filtration - 2.5 mm Al. Scanned area size (cylinder) - 50 × 37 mm, three-dimensional image element (isotropic voxel) size - 0.76 × 0.76 × 0.76 mm. The patient's radiation dose in one examination was 0.04 mZv (time 40 - 45 s).

A series of axial and proximal sections were taken in the area of the bone defect. Histograms are used to assess the dynamics of bone density and its structure - a set of applications for processing medical images using the Medical Imaging Interaction Toolkit (MITK 2015.05) [11] Bone density in the area of the defect (HUd) in Hounsfield scale (HU) units at all follow-up periods. For individual assessment, osteointegrations determined the bone density (HUr) in the reference area of interest, which was selected in the area adjacent to the defect, and the relative magnitude - the ratio HUd/HUp - was calculated.

Results and discussion

Computer tomography data show that the density of the osteoplastic material "Kollapan" is practically indistinguishable from the reference zone. A study of computer tomograms in 18 patients revealed that 6 months after resection of the tooth root apex, the formation of reparative osteogenesis is observed. However, bone density measurements showed that the density of bone tissue in the area of the defect is lower than the density of healthy bone tissue and is equal to 0.98. This indicates the regeneration of the entire defect after surgery (see table). The data also indicate that computer tomograms of patients: the area of the defect after surgery is indistinguishable from the healthy bone defect tissue, a bone pattern is observed in the area of the defect.

Conclusion

Xenogenic, semi-synthetic osteoplastic material "Kollapan" helps to replace the bone defect with regenerated. However, 6 months after the root apex resection operation, the ratio of bone density in the defect area to healthy bone tissue does not exceed 0.86. This indicates that osteogenesis is incomplete. After 12 months, bone density indicators in the defect area almost reach the density values.

Healthy bone tissue The ratio of bone density in the defect area to the reference zone tissue is 0.98. Thus, in this group, the process of bone tissue regeneration is completed 12 months after RVC.

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